



**THE MISSISSIPPI  
SCHOOL FOR  
MATHEMATICS & SCIENCE**

**2018-2019**

**COURSE CATALOG**

*An Opportunity for Excellence*

**The  
Mississippi  
School for  
Mathematics and Science**

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**Course Catalog  
2018-2019**

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# THE MISSISSIPPI SCHOOL FOR MATHEMATICS & SCIENCE

## Introduction

The Mississippi School for Mathematics and Science graduation requirements are designed to give each student a well-balanced program with a broad range of electives and advanced study options. Electives, if wisely selected, will help the student explore and develop his/her own interests and abilities. We hope that this guide will help the student and his/her parents plan an exceptional program of study while at MSMS. At the critical decision points in the final two years of high school, the student should periodically review his/her educational goals and thoughtfully develop a program of studies that will help to achieve these goals.

A few guidelines to be followed are:

- Keep minimum and maximum course loads in mind.
- Know MSMS graduation requirements.
- Consider expectations and admissions criteria of prospective universities.
- Before selecting a course, check the description to be sure it fits your needs, interests, and abilities -- and that you have completed the prerequisite course work necessary for enrollment.
- Plan ahead -- develop a two-year plan of study

The course offerings described in the MSMS Course Catalog have been developed for the 2018-2019 school year. They have been designed to provide both depth and breadth in the instructional program. An effort is made to accommodate student interest, with final decisions on any year's course offerings based on staff availability and satisfaction of minimum enrollment requirements.

**This course catalog is intended to provide guidance in developing a two-year plan of study and course selection. Policies specific to academic and residential life will be printed in the 2018-2019 MSMS Student Handbook.**

# **SPECIAL ACADEMIC PROGRAMS**

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## **Correspondence Courses/Virtual Courses**

*Mississippi Accountability Standards* and MSMS allow no more than one (1) Carnegie unit to be earned through completion of an approved correspondence course(s). It is recommended that students complete correspondence courses prior to attending MSMS. However, students who have approval to be enrolled in a ½-credit correspondence course while at MSMS must complete the course in one semester. It is recommended that 1-credit courses be completed in one semester but with approval students in 1-credit courses may have an extended time period, not to exceed two semesters. **Neither correspondence credit nor virtual school credit will apply to the 13 Carnegie units required to be earned at MSMS.**

## **Dual Credit**

MSMS currently offers specific courses in English, Mathematics, Social Sciences, Computer Science, Engineering and Physics on our campus which MUW or MSU accepts for dual credit. Dual credit agreements may be developed or revised following publication of this course catalog; students and their parents will be notified of revised dual credit agreements via an addendum to this catalog. MSMS students who are enrolled in approved dual credit courses must (1) meet the early admission standards specified in the dual credit agreement, (2) meet all course prerequisites as specified, and (3) complete the appropriate college admissions paperwork. All dual credit courses require a minimum composite score on the ACT of 25. Students taking dual credit courses will receive a grade on both the MSMS high school transcript and the transcript of the college or university awarding credit. A student who successfully completes a dual credit course will earn both high school and college credit. If a student leaves MSMS, or for any reason drops a Dual Credit class, it is the responsibility of the student to drop the class from the University affiliate. Failure to do so could result in an "F" on the University transcript.

**Note:** For dual credit, dual enrollment students, the MSMS first semester grade will serve as the final grade for the first semester university course; the MSMS second semester grade will serve as the final grade for the second semester university course.

## **Dual Enrollment**

With the approval of the Director of Academic Affairs, students who meet early admission standards at MUW or MSU and complete the appropriate admission paperwork are eligible to take classes at MUW or MSU for college credit. Juniors are allowed to be dual enrolled in the spring semester. A student who successfully completes a dual enrollment course will earn college credit only.

**IMPORTANT NOTE regarding dual credit and dual enrollment:** By enrolling in more than 29 college credit hours, a student may be considered a sophomore at some universities, thus impacting eligibility for freshman scholarships (See your Academic Counselor for more information.) Dual Credit and Dual Enrollment course grades are included in respective colleges' GPA and will affect scholarship eligibility.

## **Special Topics**

Special Topics are offered on a limited basis to students who have a strong academic background and an interest in intensive supervised study beyond scheduled course offerings. **Special Topics are taken for credit over and beyond MSMS graduation requirements.** Other options will be considered only in special circumstances. A student interested in independent studies must initiate a *Request for Special Topics* available from his/her counselor. A study plan, agreed upon by teacher, student, counselor, and approved by the Director of Academic Affairs, must be in place prior to the start of the study.

## Independent Study

An "Independent Study" refers to courses listed in the course catalog that cannot be scheduled by a student. Students interested in an independent study must have the approval of the instructor and Director for Academic Affairs, **Any course that can be scheduled cannot be taken as an independent study at MSMS.**

## Interventions

The academic progress of all MSMS students is monitored throughout the year. A Student Concerns committee meets regularly (other than when the Academic/Behavioral Review Committee meets) to discuss actions that can be taken to assist students who are on Academic Probation, Academic Watch, or for students who experience a decline in grades during the nine weeks. The Student Concerns Committee is comprised of administrators, counselors, staff, and faculty who want to attend the meetings. The Academic/Behavioral Review Committee meets every 9 weeks to determine the status of students who have been identified with academic and/or behavioral issues. The Academic/Behavioral Review Committee consists of essentially the same individuals as the Student Concerns committee: administrators, counselors, staff, and faculty. The only difference is that faculty members must be present on the Academic/Behavioral Review Committee. Students will be placed on Academic Probation, Academic Watch, and/or an Academic Intervention Plan will be devised and implemented as needed to meet individual student needs. The purpose of the review will be to determine which students are not successful in their learning and/or living environment and to make recommendations for strategies to assist those students. Upon review of student grades, academic probationary status may be assigned if a student:

- 1) has earned two or more failing grades (0-69) during any 9 week grading period;
- 2) has earned a semester grade of NC (no credit) in one course;
- 3) has earned one final grade of NC;
- 4) has more than one INC (incomplete) at the end of any 9 week grading period;
- 5) has not worked to his/her potential as reflected by grades, attendance, and/or behavior;
- 6) has been recommended for consideration by a teacher, counselor, or parent.

Students will remain on academic probation for a minimum of 4 ½ weeks. Students who are not performing up to expectations and/or who are on academic probation will have specific strategies developed to assist in their academic progress which may include, but are not limited to:

- 1) assignment to required tutorials;
- 2) assignment to required study hours/suspension of privilege plan;
- 3) assignment to Individualized Study Plan (ISP) or Required Studies;
- 4) curtailment of social and/or extracurricular activities;
- 5) development of a plan of improvement.

Attending MSMS is considered a special opportunity and, in keeping with the MSMS philosophy, success is an expected academic outcome for students. Students will not be extended an invitation to return to MSMS and must reenroll at their home school for the remainder of their secondary education if any one of the following applies:

- 1) Students receiving three or more grades of NC (no credit) that are below 60% at the end of the first nine weeks;
- 2) Students receiving two or more NC's, INC's (incompletes), or a combination of the two at the end of the first semester (this includes semester and year-long courses);
- 3) Juniors receiving two NC's, INC's, or a combination of the two at the end of the second semester (this includes semester and year-long courses);
- 4) Juniors failing to earn six credits at the end of the junior year;
- 5) Juniors who, due to failure of one or more courses, will be unable to meet MSMS graduation requirements (for example, a student with no foreign language credit from his/her home school who

fails the first year of a foreign language as a junior cannot take two years of foreign language concurrently as a senior to meet the MSMS graduation requirement of two Carnegie units of foreign language); **students must successfully complete two years of the same foreign language to graduate from MSMS;**

- 6) Students failing Algebra II;
- 7) Juniors who fail to earn credit for Foundations of Higher Math prior to the senior year;
- 8) Seniors, at the end of the first semester, who have failed coursework that prohibits their being able to meet MSMS graduation requirements in the remaining semester of their senior year;
- 9) Students who have been placed on probation on two or more occasions;
- 10) Students earning three or more C's as final grades in core classes;
- 11) Students demonstrating inappropriate behavior (including excessive tardies and/or absences) in keeping with the school's academic or behavioral expectations.

During the summer between a student's junior and senior years, an assessment will be made by school officials based on behavioral and academic performance, as well as other factors independently considered, regarding the student's continuation at MSMS.

Parents are expected to contact teachers at least four times per semester for progress report information. Parents are also asked to view their children's grades through Power School. A session will be held during orientation to assist parents with setting up their Power School accounts to allow them to receive weekly grade and behavioral reports.

### **Summer School**

Juniors who fail Foundations (MA 235) during their junior year must take and pass a Pre-Calculus course at a community college or university during the 1<sup>st</sup> summer session following their junior year. The student is also expected to pass the MSMS final examination in the course. All expenses for the college course will be the responsibility of the parents/guardians. **Juniors who fail Foundations in the summer and/or who do not pass the MSMS final examination in the course will not be allowed to return to MSMS their senior year.**

At the discretion of the Director for Academic Affairs, MSMS may accept summer school credit or award placement for certain **pre-approved** courses taken at a community college or university. **CREDIT WILL NOT BE ACCEPTED FROM ANOTHER HIGH SCHOOL.** Summer courses taken before official enrollment in the fall at MSMS will become a part of the student's home school transcript.

### **Summer courses for remedial credit:**

- Any student who has failed a course at MSMS must obtain written approval from the Director for Academic Affairs for any plans to make up credit for the failed course by attending summer school at a community college or university. This approval must be received before registering for summer school. The student must provide course descriptions from the catalog of the institution he/she wants to attend and course syllabi. The administration of MSMS, with input from the appropriate department, will make all decisions regarding the specific course(s) and the length of the course(s) (one or two semesters) to be taken for MSMS credit. After completing the course(s) and before fall classes begin at MSMS, the student will also be expected to pass the MSMS final examination in the course(s) for which credit is being sought.
- No permission will be given to receive MSMS credit for a summer course to be used as a substitute for an MSMS course unless the student has attempted the MSMS course and received a failing grade.

**Summer courses for placement (no credit awarded):**

- Students who have completed the junior year and want to attend summer school in order to meet prerequisite requirements for a more advanced course in the MSMS curriculum will need approval of the counselor, the academic department involved, and the Director for Academic Affairs. This approval should be gained well before leaving the campus at the end of the junior year. The student must provide course descriptions from the catalog of the institution he/she wants to attend and course syllabi. After completing the course and before fall classes begin at MSMS, the student will also be expected to pass the MSMS final examination in the course taken in summer school before that course may serve as a prerequisite for a more advanced MSMS course.



# **GUIDELINES FOR SELECTING COURSES**

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## **Registration Process**

The registration process begins with a general meeting during which graduation requirements, course offerings, and the registration process are explained. It ends when students have selected their courses for the next school year and returned their registration form to MSMS.

Students who come from a public or private school or program (correspondence, tutorial, or home study) not accredited regionally or by a state board of education must take placement tests in English, Social Studies, Math and Science.

Juniors having questions are encouraged to call MSMS, seek the counsel of faculty members and counselors of their home schools, and confer with their parents. Seniors are asked to discuss their selections with their individual counselors, MSMS faculty members, and their parents.

## **Subject Area Testing Requirements Mississippi Department of Education**

### **Class of 2019 and 2020**

Students in the Class of 2019 and the Class of 2020 must pass the subject area tests in Algebra I, U.S. History from 1877, English II, and Biology I as a requirement for graduation.

State Board Policy 3800 [[http://www.mde.k12.ms.us/SBE\\_policy\\_manual/3800.htm](http://www.mde.k12.ms.us/SBE_policy_manual/3800.htm)] outlines the graduation requirements for the Mississippi Subject Area Tests for the following circumstances: when a student has already earned a Carnegie Unit in a course prior to implementation of the new graduation policy, when a student enters a Mississippi public school from another state, private school, or home school, and retesting procedures for when a student fails to pass a required Subject Area Test.

## **Selecting Courses**

The following recommendations are based on prior experience in working with MSMS students. We ask that the student follow these guidelines, although we do realize that each student is an individual with particular abilities and needs. Please use the toll free line (1-800-400-4656) to contact an academic counselor if questions arise.

- Read thoroughly the course descriptions in the Course Catalog, paying particular attention to the necessary prerequisites and amount of credit for each course.
- Read carefully MSMS graduation requirements.
- Schedule required courses first then elective courses, thinking in terms of a two-year plan. It is important that a student consider his/her background, interests, college and career goals, and aptitude.
- The results of placement tests, along with various recommendations, will be sent to the student as soon as possible to facilitate course selection.
- **The student should not enroll in any course for which he/she has already received credit.**

- **Students who have not taken Health prior to attending MSMS must complete the course by the end of their junior year.** Health will not count toward the 13 credits required at MSMS.
- Students will be required to enroll in a sufficient number of required and elective courses so that the total number of credits earned at MSMS is at least 13. Only one credit in the Arts may apply toward the 13 MSMS credits required for graduation. No correspondence course or virtual school credits may be used to meet the requirement of 13 MSMS credits.

## **MSMS GRADUATION REQUIREMENTS CLASSES OF 2019 & 2020**

At least 13 credits (Carnegie units) must be earned while enrolled at MSMS. Previous high school, virtual high school, correspondence credit or college credits earned at another institution will not count toward the 13 required MSMS credits. The following **7.5 credits must be earned at MSMS**:

**English** – Each student is required to earn **two credits** by successfully completing approved English classes each year. Each student must be enrolled in a required English course every semester.

**Mathematics** – Each student is required to earn **two credits** in mathematics, to include 1/2 credit in Calculus and 1/2 credit in Statistics.

**Science** – Each student is required to take and earn one credit in biology, one credit in chemistry, **and** one credit in physics for a total of **three credits**.

**Swing Credit** (Mathematics/Science Elective) – In addition to the above Mathematics and Science requirements, each student is required to take and earn an additional ½ **credit** of mathematics, science, robotics, or computer programming.

**Social Sciences** - Specific requirements depend on what the student has previously completed.

**Foreign Language** – Specific requirements depend on what the student has previously completed. Graduates must complete two years of the same Foreign Language.

**Health** -- Students who have not taken health prior to attending MSMS must complete the course by the end of their junior year.

**Fine Arts** – 1 credit if not previously completed at your home school.

**Physical Education** – ½ credit if not previously completed at your home school.

**Business & Technology** – 1 credit if not previously completed at your home school.

**All students must have earned credit in Algebra I and Unified Geometry before entering MSMS.** It is strongly recommended that Algebra II be completed also. In the event that a student has completed Algebra I and Algebra II, but does not have a credit for Unified Geometry, the student may be granted provisional admission and must complete a Geometry course either by correspondence, virtual school or summer school offerings. **This credit must be earned before the beginning of the junior year at MSMS.** A course in Unified Geometry will not be taught at MSMS.

The following courses are required for MSMS graduation, but credit may be earned prior to grade 11. Students meeting any of these requirements before enrolling at MSMS will complete elective courses to earn the required total of 13 credits at MSMS.

| CURRICULUM AREA       | CARNEGIE UNITS | REQUIRED COURSES   |
|-----------------------|----------------|--|
| ENGLISH               | 4              | Courses must require substantial communication skills and may not be compensatory in nature.   |
| MATHEMATICS           | 5              | Algebra I <b>or</b> CCSS Algebra I <b>or</b> CCSS Integrated Math I (1 credit)<br>Algebra II <b>or</b> CCSS Algebra II <b>or</b> Integrated Math III (1 credit)<br>Unified Geometry <b>or</b> CCSS Geometry <b>or</b> CCSS Integrated Math II (1 credit)<br>Trigonometry (1/2 credit)<br>Foundations of Higher Math or its equivalent <b>or</b> CCSS Advanced Math (1/2 credit)<br>Calculus <b>or</b> AP Calculus AB <b>or</b> AP Calculus BC (1/2 credit)<br><b>or</b> AP Statistics (1/2 credit) |
| SCIENCE               | 4 ½            | Biology I (1 credit)<br>MSMS Biology (1 credit)<br>MSMS Chemistry (1 credit)<br>MSMS Physics (1 credit)<br>MSMS Computer Science (1/2 credit)  |
| SOCIAL SCIENCES       | 4              | U.S. History (1 credit)<br>U.S. Government (1/2 credit)<br>Mississippi Studies (1/2 credit)*<br>World History (1 credit)<br>Economics (1/2 credit)<br>Geography (1/2 credit)   |
| BUSINESS & TECHNOLOGY | 1              | Computer Applications (1/2 credit) and Keyboarding (1/2 credit) <b>or</b> Computer Discovery in the 8 <sup>th</sup> grade (1 credit)**   |
| HEALTH                | ½              | Comprehensive Health or Family and Individual Health   |
| PHYSICAL EDUCATION    | ½              | Class of 2015 and 2016****   |
| THE ARTS              | 1              | Examples: Band, Choral Music, Drama, Drawing, Painting, Sculpture***   |
| FOREIGN LANGUAGE      | 2              | Two units of the same foreign language required  |
| OTHER ELECTIVES       | 2              | Your Choice  |
| TOTAL UNITS REQUIRED  | 24 ½           |  |

\* Credit earned for State/Local Government in any other state by an out-of-state student who enters after the sophomore year can stand in lieu of MS Studies. If the student took a State/Local Government course in a grade level that did not award Carnegie unit credit, then any other 1/2 unit social studies course may be accepted.

\*\* Evidence of proficiency in Keyboarding & Computer Apps is accepted in lieu of the required courses if the student earns one unit in an approved Business and Technology course

\*\*\* Only one credit in the Arts may be applied toward the 13 required MSMS credits

\*\*\*\*Students who have received credit in interscholastic athletic activities, band, and ROTC before entering MSMS have fulfilled the physical education requirement.

## Recommended Course Load

### Juniors

**Entering juniors are encouraged to limit their academic credits to 7 ½.** The minimum requirement is 7 academic credits for the year. Exceptions to this are assessed on an individual basis and the decision to allow extra courses rests with the Director for Academic Affairs. Students are expected to have no fewer than six academic courses each semester. **Sometimes students mistakenly have registered for seven courses instead of seven credits.**

When second semester begins, the student will be given an opportunity to add additional one-semester courses, contingent upon his/her first semester grades, available seats, and approval of the Director for Academic Affairs. Due to increased time demands, it is recommended that students limit the number of advanced courses taken each year.

### **MSMS 101**

MSMS 101 is a required course for juniors. The purpose of MSMS 101 is three fold:

1. To present skills that are essential to success at MSMS to include time management, study skills, test taking strategies, communication skills, and stress management.
2. To prepare students for national examinations such as ACT, PSAT, SAT and AP exams.
3. To help students navigate the college search and application process. Students will receive information on the latest scholarships available.

### Seniors

A minimum of 6 academic credits is required for the senior year. Seniors are advised to consider graduation requirements and their performance as juniors in deciding on the number of courses to select. Pursuit of courses that enhance preparation for a college/university major is suggested.

**Students are advised to think in terms of planning a two-year curriculum at MSMS.**

### Definitions:

**Credit:** Carnegie Unit

**Course:** Class

**Pre-requisite:** A course that must have been taken with credit earned prior to another course.

**Co-requisite:** A course that must be taken in the same semester or must have been taken prior to another course.

### **Schedule Changes**

Students will have until June 8, 2018 to submit a written request for a change in course selections for the next school year. After June 8, 2018 schedules will be completed and changes will not be made until students arrive in August. Written requests for changes in course selection should be e-mailed to the appropriate counselor.

**Conflicts with the master schedule or an insufficient number of students requesting to take a course may result in one or more alternate course selections appearing on a student's schedule. Students will be notified of conflicts that require selection of additional course offerings. Many MSMS courses are offered as a single section; a conflict matrix is used in placing those sections in the master schedule to meet the requests of the largest number of students. Students who**

**request several of these single section courses should anticipate that one or more may be unavailable due to scheduling conflicts.**

**Students sign up for courses primarily based on freedom of choice. The school hires teachers, plans facilities, and develops the master schedule around these choices.** Therefore, schedule changes will not be considered to enable students to choose teachers or specific periods. All schedule changes are made through the Academic Counselors in the Counseling Center. **Students must follow their schedule until notified in writing of the change.**

## **Adding and Dropping Courses**

### **Adding a Course**

On a space-available basis, students wishing to add courses to their schedules have one week from the first day of class at the beginning of each semester to do so.

### **Dropping a Course**

**With approval of the students' Academic Counselor, students will be allowed to drop a course from their schedules during the first four weeks of each semester.**

Because year-long courses are taught in 2 semesters and students are evaluated at the end of both semesters, failure to pass either the fall or spring semester will be recorded as "NC" on the student's grade report. A "NC" may affect the student's privilege to return to MSMS and/or to graduate. Students deemed unable or unwilling to accept the commitment necessary to be successful in this special learning environment will be returned to their home school provided that applicable due process protections are afforded the student.

Students are not allowed to drop courses that result in a class load of less than 7 courses for juniors and 6 courses for seniors (A minimum of thirteen (13) credits must be earned while enrolled at MSMS). **Seniors are advised that dropping a course may impact scholarship status – check with your college/university for more detail.**

## **COURSE OFFERINGS**

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This catalog lists all of those courses that the school is prepared to offer. Since the total enrollment of MSMS is relatively small, it may not be possible or desirable to offer all courses every year. **A sufficient number of students must request a course for the course to be offered.**

# COMPUTER SCIENCE and ENGINEERING

## Computer Science Courses

### Introduction

We often use tools to aid us in solving problems. The hammer is a hand tool; it amplifies and extends the power of the hand. We can use it to help us solve such problems as building a birdhouse for bluebird or building a Habitat for Humanity home for a member of our community. The computer is also a tool – a mind tool; it amplifies and extends the power of the mind. We can use it to help us solve such diverse problems as regulating the flow of drugs for a patient, generating images of imaginary landscapes, or controlling the flight of jet aircraft. Computer Science is a helping profession; computer programmers help people by constructing software solutions to their problems.

The computer is an especially useful tool because it can be programmed to do many different things. A famous textbook describes Computer Science in its title: *Data Structures + Algorithms = Programs*. More prosaically, we can think of Computer Science as the study of how to solve problems by representing the problems symbolically in a form (data structure) that the computer can utilize, plus recipes (algorithms) describing the sequence of steps necessary to generate a solution to the problem.

The purpose of the Computer Science department is to provide interested MSMS students with the opportunity to explore, understand, and manipulate computer and related technologies.

Computer Science courses are not required for graduation beyond those required by the state of Mississippi. However, we encourage all MSMS students to take a course in Computer Science because of the skills gained from them. A Computer Science course can be used to satisfy the swing credit.

### Objectives

Within the study of Computer Science, students will be equipped:

1. To think clearly about the process of problem-solving;
2. To use a modern programming language to solve problems using a computer; and
3. To understand how to utilize computer technology to accomplish their goals

### CS 705 Integrating Computer Science concepts with other Sciences

This course is designed to introduce students to the central ideas of computing and computer science, to instill ideas and practices of computational thinking, to show how computing and computer science change the world, and to engage students in the creative aspects of the field. Programming is one of the creative processes that help transform ideas into reality, so instruction and laboratory activities will enable students to acquire proficiency in modern programming languages. Students will explore computer science's relevance to and impact on the world today, they will investigate the innovations in other fields that computing and computer science have made possible, and they will examine the ethical implications of new computing technologies. Students in these courses will work individually and in teams to solve problems, developing their communication and teamwork skills. Students will learn the basics of programming in the python programming language so that they will be prepared for computational science in any field they wish to pursue.

Prerequisite: Algebra II  
Credit: ½  
Length: 1 semester



### **CS 703 - Introduction to Programming (College credit)**

This course provides an introduction to the process of problem solving using the computer programming language. Python which is a powerful, modern, but easy to understand programming language is used to provide the student with a solid foundation in both theoretical and practical aspects of programming and problem solving. Laboratory assignments in this course will be challenging to improve students' abilities to problem solve. The objectives of this course are to introduce the principles and practice of software development using a modern object-oriented programming language, introduce and develop the problem solving skills necessary to construct software solutions to problems, and give the student an understanding of the data structures and control structures available in the target language, and an ability to understand and create common algorithms.

Prerequisite: Algebra II  
Credit: ½  
Length: 1 semester

### **CS 704 – Intermediate Programming (College credit)**

This course explores object-oriented problem solving, design, and programming, transitioning the student from Python to C++. It also provides an introduction to common data structures, the design of algorithms, and the analysis of algorithm complexity. Concepts such as error handling and data verification will also be explored.

Prerequisite: Intro to Programming or consent of instructor Credit: ½  
Length: 1 semester

### **CS 706 iPhone App Design using Swift**

This class introduces students to tips, tools, and techniques for designing mobile applications for Apple iPhones. Topics include Software Engineering Principles, Event Handlers, Condition Statements, and Animation. Students will apply this knowledge to projects that increase in complexity as the course progresses.

Prerequisite: Intro to Programming or consent of instructor  
Credit: ½  
Length: 1 semester

### **CS 716 – Introduction to Robotics**

This course is an introduction to the study of Robotics and programming. Students will learn to program robots using the Arduino micro controller and programming language in order to perform both simple and complex tasks individually and in groups. Students will also learn to use 3D printers to create the bodies, arms, wheels, and any other miscellaneous parts needed. This course will focus on the creative aspects of the Robotics design process while also requiring students to bring their creations to life with programming.

Prerequisite: Integrating Computer Science concepts with other Sciences, or Intro to Programming or consent of instructor  
Credit: ½  
Length: 1 semester

### **CS 717 - Introduction to Game Design**

This course will give students an opportunity to learn what makes a game fun, challenging, and addictive. Students learn how to tell a story, how to create worlds that obey the laws of physics, and how to create animations. Students will work in groups to learn about teamwork, working with someone else's code, and breaking a project down into subcomponents.

Prerequisites: iPhone App Design, or Intermediate Programming  
or consent of instructor  
Credit: ½  
Length: 1 semester

### **ID 170- 3D Modeling**

The purpose of this class is to provide students with an introduction to computer aided design (CAD) concepts and to develop critical thinking and problem solving skills. The course will use the website Onshape.com to create 3D models.

Prerequisite:  
Credit: ½ (elective credit)  
Length: 1 semester

### **CS 720 – Computer Problems/Special Topics**

Computer problems/special topics is an individualized advanced class where students will have the flexibility of choosing their projects or topics of interest. The projects could involve any aspect of modern computing.

Prerequisite: Consent of instructor and Director for Academic  
Affairs  
Credit: ½ or 1 (elective credit beyond the required 13.0)  
Length: 1 semester or 1 year

## **Engineering Courses**

### **Introduction**

The purpose of the Engineering Program is to expose students to a variety of engineering courses, concepts, skills and applications so that if completed the student will have a beginning background in engineering entering college and eventually the work force. Students will be provided hands-on, real-world learning experiences through the Engineering Lab that will help them learn problem solving skills.

### **SC 345 – Electronics**

This course is offered to allow students an opportunity to develop expertise in the area of electronics. Assignments will be made from both text and laboratory designs. Students can gain familiarity with microprocessors, digital circuits, and analog circuits in this course. A major part of the grade will be a final project. **(NO LAB DAY)**

Co-requisite: AP® Physics-1  
Credit: ½  
Length: 1 semester

### **CS 716 – Introduction to Robotics**

This course is an introduction to the study of Robotics and programming. Students will learn to program robots using the Arduino micro controller and programming language in order to perform both simple and complex tasks individually and in groups. Students will also learn to use 3D printers to create the bodies, arms, wheels, and any other miscellaneous parts needed. This course will focus on the creative aspects of the Robotics design process while also requiring students to bring their creations to life with programming.

Prerequisite: Integrating Computer Science concepts with other Sciences, or Intro to Programming or consent of instructor  
Credit: ½  
Length: 1 semester

### **SC 210 – MSU Introduction to Engineering (College Credit)**

This course will be taught at Mississippi State University one day a week for MSMS seniors. This course provides an introduction to engineering disciplines and fundamental engineering principles through problem-based learning, including engineering mechanics, engineering materials, mass balances, heat/fluid transfer, electrical circuits, technical writing and teamwork.

Credit: ½  
Length: 1 semester

### **SC211 – Introduction to Chemical Engineering (College Credit)**

The purpose of this course is to analyze fundamental engineering problems and systematically develop appropriate solutions. Students will use basic Excel tools to collect and analyze data from engineering designs and use this process for making design and performance improvements; use the Engineering Design cycle concept for approaching our Team Challenges and for making improvements in the processes or designs.; tack a technical problem from a word description through defining it with appropriate drawings, concepts, symbols and equations to reach a solution. This course is open to juniors and seniors.

Credit: 1  
Length: 1 semester

# ENGLISH

## Introduction

The English program at the Mississippi School for Mathematics and Science prepares students for successful performance in college English by helping them enter the college English curriculum at the highest possible level.

## Guidelines for Required English Courses

MSMS requires that English be taken **each semester**. Journalism, Yearbook, Debate, Southern Writers, and Creative Writing are offered to all students but may **NOT** be used to meet graduation requirements in English. **Juniors are required to enroll in a 100-level course each semester to satisfy the 1-credit requirement. Seniors are required to enroll in either EN 200 (University English II), or EN 214 (Selected Works of British Literature).** Seniors can earn elective credit for courses other than EN100, EN200, or EN214. **Registration for courses as electives will depend upon the space necessary to accommodate all students who need courses to meet the English requirement for graduation.**

## Objectives

Specifically, the objectives of the program are to equip students:

- 1) To comprehend, interpret, evaluate, and use what they read;
- 2) To write well-organized, effective papers;
- 3) To listen effectively and discuss ideas intelligently;
- 4) To appreciate the breadth and depth of their literary heritage;
- 5) To discover how their literary heritage enhances imagination and ethical understanding;
- 6) To recognize how their literary heritage relates to the customs, ideas, and values of today's life and culture; and
- 7) To utilize technology as they integrate reading, writing, speaking, listening, and viewing in English studies.

## EN 100 – University English I (College Credit)

Students who take University English I must have a composite score of 25 on the ACT. This course is offered for dual credit. By an articulation agreement with the Mississippi University for Women, students who successfully complete the class will satisfy the requirement for junior English at MSMS and receive six semester hours of college credit: three hours for MUW-EN 101 (English Composition I) and three hours for MUW-EN 102 (English Composition II). The course is a survey of American literature from the colonial period to the present. It also has a writing component that includes narrative, descriptive, expository, and critical essays, and a research paper.

|                |   |
|----------------|---|
| Prerequisites: | Junior standing, admission to MUW,<br>and a composite Act score of 25 |
| Credit:        | 1   |
| Length:        | 1 year  |

**Note:** For EN 100 students, the MSMS first semester grade will serve as the final grade for the first semester university course; the MSMS second semester grade will serve as the final grade for the second semester university course.

### **EN 110 – American Literature I**

This course is a study of the development of American literature with an emphasis on major writings and their relations to the main currents of American thought from the colonial period through the middle of the nineteenth century. Successful students will complete outside readings, will respond to the literature through critical essays and timed examinations, and will participate in class.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 115 – American Literature II**

This course is a study of the development of American literature with an emphasis on major writings and their relationships to the main currents of American thought from the middle of the nineteenth century through the present. Successful students will complete outside readings, will respond to the literature through critical essays and timed examinations, and will participate in class.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 122 – Late American Drama**

This course explores American literature and culture of the twentieth century through the works of selected major dramatists. Students are expected to complete outside reading, to respond to the literature through critical and creative writing, and to participate actively in class discussions and role-playing. Students will study a variety of American dramatists with major emphasis on the works of Tennessee Williams. This course is offered during alternating spring semesters.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 130 – Shakespeare I: The Romantic Comedies and Histories**

This course is an introduction to the works of William Shakespeare and will concentrate on early plays. Students will read approximately a dozen plays, including The Comedy of Errors, Richard III, and the Henry plays.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 132 – Shakespeare II: The Tragedies and Late Romances**

The course will focus on the later plays of Shakespeare. Students will read ten to twelve plays, including Othello, King Lear, Anthony and Cleopatra, and The Tempest.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 134 – Classical Literature I: Epic Poetry**

The focus of this course is on the great epic poems of the Greeks and Romans. Students will read The Iliad, The Odyssey, and The Aeneid. This literature provides students with an excellent background for more modern European and American works.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 135 – Classical Literature II: Drama and Philosophy**

Students will study the works of the great Greek playwrights: Aeschylus, Sophocles, Euripides, and Aristophanes. Students will also read selections from Greek and Roman philosophers, including Plato, Aristotle, Seneca, and Epictetus.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 140 – American Poetry**

This course will focus on the poetry of Whitman, Dickinson, Frost, and Stevens. Students will also study the works of several other modern American poets. Students will get an in-depth look at the works of our finest poets. Offered during alternating spring semesters.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 152 – Journalism I**

In Journalism I, students both produce the school newspaper and study the elements of journalism. Students are introduced to the basic elements of composition, layout, and editing. Students will be expected to become proficient in word processing; article, feature, sports, and editorial writing; using the digital camera or video camera; and retouching pictures using PhotoShop.

Prerequisite: None  
Credit: ½  
Length: 1 year

### **EN 155 – Journalism II**

In Journalism II, students will continue their study of journalism. Issues of leadership such as Editor and Internet Editor are the focus of this curriculum. Students will learn and use Quark Passport to layout the newspaper; manage files and articles from Journalism I students; conduct editorial board meetings; make decisions about the content and format of *Vision*, the school newspaper; edit articles and evaluate them for inclusion into the paper; and learn about HTML composition, web site management, and web site publication.

Prerequisite: None  
Credit: ½  
Length: 1 year

## **EN 200 – University English II (College Credit)**

Students who take University English II must have a 25 composite score on the ACT by the April national test date of the junior year and complete enrollment requirements for MUW students. The course offers senior students an opportunity to receive dual credit in English from MSMS (English IV requirement) and from Mississippi University for Women (three hours for MUW-EN 201, Survey of Early English Literature, and three hours for MUW-EN 202, Survey of Late English Literature). The course is a study in chronological order of selected works representative of different periods of English literature from *Beowulf* through the modern period. Emphasis is given to the historical, intellectual, and social contexts which produced the literature and on the resulting intertext of literature and society. The course includes collateral readings. Students will write a variety of compositions, including critical essays and a research paper.

Prerequisites: Senior standing, admission to MUW, and an  
ACT Composite of 25  
Credit: 1  
Length: 1 year

**Note:** For EN 200 students, the MSMS first semester grade will serve as the final grade for the first semester university course; the MSMS second semester grade will serve as the final grade for the second semester university course.

## **EN 214 – Selected Works of British Literature**

Students in this yearlong course will read stories, dramas, poems, and essays and view films representative of British and Commonwealth literature. They will consider the works in relation to significant themes and literary movements of the ages which produced them, as well as explore the social and intellectual contexts in which they were written. Special attention will be paid during the second semester to the periods in which the British Empire expanded, then lost, its colonial power. Students will utilize library and Internet sources to produce presentations for class and for compositions, including critical essays and a research paper.

Prerequisite: Senior standing  
Credit: 1  
Length: 1 year

## **EN 216 – World Literature**

In order to build on the diversity of students at MSMS, World Literature explores in translation the major writers from the main continents, Europe, the Americas, Africa, the subcontinent of India, China, and Japan from approximately 1650 to the present. Students will be encouraged to pick a culture and an era in the culture and develop a paper as well as a presentation about literature works and their background. Readings will include the major genres of literature: poetry, short story, novel, drama, and essay. Authors such as Goethe, Hugo, Pushkin, Tolstoy, Tagore, Lu Xun, Joyce, Borges, Maufouz, Nobuo, Robbe-Grillet, Yehuda, Saadawi, Eileen Chang among others will be selected to illustrate the qualities and culture of their origin. Students will read about 2000 pages, write about 8 essays, a research paper, and complete a spring project for Globe Day.

Prerequisite: Senior standing  
Credit: 1  
Length: 1 year

### **EN 235 – Southern Writers**

Students will explore the American South in literature and film and examine influences shaping Southern writing, especially its exceptional flourishing in recent decades. Students will prepare for oral and written presentations in a seminar-type setting. Offered during the spring semester.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **EN 240 – Creative Writing I**

Students will practice techniques of poetry and short fiction composition as well as write creative non-fiction pieces. Part of the course requirement is to write for, design, and lay out a literary magazine for both print and electronic publication. Students will prepare manuscripts for local, state, regional, and national competitions. The course will meet for ninety minutes each week for the entire year. Juniors or Seniors may enroll in this course.

Prerequisite: None  
Credit: ½ (elective)  
Length: 1 year (meets one day per week)

### **EN 245 – Creative Writing II**

Students in Creative Writing II will continue to develop and practice composition techniques for writing poetry, short stories, and descriptive/narrative essays which exhibit mature elements of style: “lucidity, elegance, and individuality.” Students will pursue individualized writing projects in genres they select. Students will also write for, design, and lay out a literary magazine for both print and electronic publication. Students will prepare manuscripts for local, state, regional, and national competitions. The course will meet for ninety minutes each week for the entire year. Juniors or seniors may enroll in this course if they have earned credit in Creative Writing I.

Prerequisites: Creative Writing I and  
Recommendation of Instructor  
Credit: ½ (elective)  
Length: 1 year (meets one day per week)

### **EN 146- Contemporary Literature**

This course teaches critical reading/critical writing skills through the examination of contemporary literature. Students are expected to complete outside reading, and to respond to the literature through analytical essays, timed examinations, and class discussions. Most of the works considered in the course will have been published within the last five years or by authors who are still living. Analysis of the texts will focus on craft and structure, and arguments and themes. Topics will range from coming of age to social justice. Offered in the fall semester.

Prerequisites: None  
Credit: ½ (elective)  
Length: 1 semester (fall only)



## **EN 250 – Special Topics in English**

This elective course is based on student interest and may be offered on a one-time or a rotating basis. It may concentrate on a specific topic.

Prerequisite: None  
Credit: ½ (elective credit beyond required 13.0)  
Length: 1 semester

# FINE AND PERFORMING ARTS

## Introduction

The department of Fine and Performing Arts exists to provide the aesthetic stimulation so necessary to human existence. Students are given the opportunity to excel within the contexts of artistic expression and public performance.

## Guidelines for Required Fine Arts Courses

MSMS requires students to complete **one credit** of fine arts during grades 9-12. Courses such as chorus, band or art taken during the 9<sup>th</sup> and/or 10<sup>th</sup> grades will meet this requirement. If you have never had one of these courses, MSMS has a broad selection from which you may choose. Only one credit of fine arts taken at MSMS may be applied toward the required 13 MSMS credits.

## Objectives

After participation in the existing courses, the student will be able:

- 1) To recognize different styles and genres of music;
- 2) To define a body of musical terms and utilize them in performance;
- 3) To apply knowledge to different performing situations;
- 4) To work within an ensemble situation;
- 5) To understand the cooperation needed to attain a common goal;
- 6) To exhibit inner discipline in a rehearsal setting, applicable to other academic pursuits;
- 7) To gain an understanding of aesthetic expression;
- 8) To gain self-confidence through public performance and art exhibits;
- 9) To use, understand, and appreciate various art mediums;
- 10) To develop and explore artistic talents;
- 11) To develop an individual artistic style through the use of various mediums;
- 12) To use and appreciate the elements and principles of design;
- 13) To appreciate all forms of art for their aesthetic value.

## FA 521 – Drawing I

Drawing I is a studio course with hands-on learning. This course is a basic introduction to the fundamentals of drawing in dry media. First, the students will work by observing geometric forms and still-life materials. At this time, an emphasis is placed on understanding the importance of value scales. Directional strokes and proportions will also be stressed. Several projects will be assigned in order to reinforce these fundamentals. Upon completion of this course, the student should obtain a good foundation on which to develop his/her talents.

Prerequisite: None  
Credit: ½  
Length: 1 semester

## **FA 522 – Drawing II**

Drawing II is a studio course with hands-on learning. The course objective is to further the study of dry media on an advanced level of training. The students will learn how to draw the human figure beginning with the separate parts of the face: the eyes, nose, mouth, ears, and hair. Hands and feet studies will follow, ending with gesture drawings and a full pose using a live model. The course will conclude with clayboard, vertical line drawings, and graphic design.

Prerequisite: Drawing I  
Credit: ½  
Length: 1 semester

## **FA 523 – Painting I**

Painting I is a studio course with hands-on learning. This course contains an introduction to basic painting techniques using the mediums of watercolor, Acrylic, and fabric paint. All projects include the study of the elements and principles of design. The color wheel and various color schemes will be explored and used to create all works of art.

Prerequisite: None  
Credit: ½  
Length: 1 semester

## **FA 524 – Painting II**

Painting II is a studio course with hands-on learning. This course is a continuation of study in painting techniques using watercolor, acrylic, and oil according to the student's preference. At the beginning of the course, entry level calligraphy will be introduced and illustrated with a painting. Next, an emphasis will be placed on the old masters and how they developed their techniques which led to their unique artistic styles. Students will begin to analyze their own unique styles as they study the focus areas of Impressionism and Post-Impressionism. The final project will be tailored to the student's strengths and preferences as a new artist.

Prerequisite: Painting I  
Credit: ½  
Length: 1 semester

## **FA 525 – Sculpture I**

Sculpture I is a studio course with hands-on learning. This is a course in the applied principles and practices in sculpture and constructive design. The student will learn the art of carving, modeling, and casting using a wide variety of materials, such as soap, wire, clay, and plaster of Paris. Students will meet the challenges of working with three dimensions instead of only two.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **FA 526 – Sculpture II**

Sculpture II is a studio course with hands-on learning. This course continues the study of three-dimensional art, its design, and construction. The materials used will be clay with an emphasis on the modeling of a human face. Learning to create pottery on the potter's wheel along with learning how to create Pop Art will conclude the course. This course encourages practice using the imagination to think outside the box.

Prerequisite: Sculpture I  
Credit: ½  
Length: 1 semester

### **FA 531 – Dramatic Performance**

This course is designed to explore the theatrical process as an art form. Students will concentrate on designing, creating, and performing original and published works.

Prerequisite: Previous theater experience or course work  
Credit: ½  
Length: 1 semester

### **FA 532 – Dramatic Production**

This course enables students interested in theater arts to further increase their knowledge of dramatic production.

Prerequisite: Dramatic Performance and consent of instructor  
Credit: ½  
Length: 1 semester

### **FA 508 – Songwriting/Music Technology**

This course begins with the study of commercial song structure and writing methods. Students will compose four assigned songs and one freestyle piece throughout the course. The course also includes instruction in digital recording and midi. The course culminates with students recording their original compositions utilizing their knowledge of music technology. Prior knowledge of music theory and the ability to play an instrument is not required but strongly suggested. Course is offered during the spring.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **FA 510 – Instrumental Performance**

This course is for those students playing string, electronic, brass, woodwind, and percussion instruments. A broad style of music will be explored and small ensembles may be used from within the group. The class will give at least two performances per semester in order to allow students to experience the creative process that is necessary to perform in a truly collective art.

Prerequisite: None  
Credit: ½ (may be repeated)  
Length: 1 semester

### **FA 511 – Choral Performance**

The MSMS Concert Singers will survey several styles of performance including classical four part singing, a cappella, jazz, and Broadway styles. Attention will be devoted to proper breathing and diction techniques, reading music, and professional performance styles. This class is activity based and will include at least two performances per semester. A solo voice is not necessary but a desire to participate in an artistic process for enjoyment is.

Prerequisite: None  
Credit: ½ (may be repeated for a total of 1 credit)  
Length: 1 semester

### **FA 512 –Beginning Piano Study**

This course is for beginning piano students. Through piano studies students will study the fundamentals of music theory. Various musical styles, melodic playing, choral accompaniment, solo and ensemble playing will be studied throughout the course. Class size is limited to 10 per semester. Students will play on keyboards in the piano studio. No prior knowledge of the piano is needed.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **FA 513 – Beginning Band 1**

If you missed the “Beginner Band Boat” for whatever reason, here is your chance!! The Beginning Band is designed to teach proper foundations of playing a wind instrument to students with no musical experience. In Beginning Band, students learn proper posture, breath support, horn carriage, and embouchure; staff, clef, time signature, rhythm, pitch, articulation, and other basic music symbols; and methods for setting goals, planning strategies, completing tasks, and evaluating results. Students will learn to perform a repertoire of instrumental literature representing various genres, styles, and cultures with expression, technical accuracy, tone quality, and articulation. As a part of the MSMS Performing Arts Curriculum, Beginning Band emphasizes that music is a creative process as well as an activity, that music is an intrinsic component of personal and cultural expression, and that music is an enjoyable hands-on activity. School concerts provide the students with opportunities to perform. There are no prerequisites for this course.

**Students must provide and choose one of the following instruments: Flute, Clarinet, Alto Saxophone, Trumpet, Trombone and Euphonium.**

Prerequisite: None  
Credit: ½  
Length: 1 semester (Fall Only)

### **FA 514 – Beginning Band 2**

Beginning Band 2 is a continuation of Beginning Band I.

Prerequisite: Consent of instructor  
Credit: ½  
Length: 1 semester (Spring Only)

### **FA 516 – Guitar Studies**

This course is for beginning guitar students. Through guitar studies students will study the fundamentals of music theory. Various musical styles, melodic playing, choral accompaniment, solo and ensemble playing will be studied throughout the course. Class size is limited to 10 per semester. Students are required to provide their own guitar. No prior knowledge of the guitar is needed.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **FA 517 – Guitar Performance**

Guitar performance class is for those students playing guitar and bass guitar. Many appropriate styles of music will be practiced and performed. Students are required to provide their own instrument. Ability to read music notation is required. Course is offered during both fall and spring semesters.

Prerequisite: Consent of instructor  
Credit: ½  
Length: 1 semester

### **FA 519 – Creative Movement and Music**

This energetic class involves movement, teamwork, sharing and listening. Students will move, shake and shimmy to various styles of music. CMM provides a safe, positive and enjoyable environment in which to study a rich variety of movement disciplines while advancing student's knowledge, confidence, skills, and motivation to engage in a lifelong, healthy and physically active lifestyle. Students in the CMM class will set and achieve personally challenging fitness goals and apply higher-order thinking skills to the scientific principles of human movement. Students will gain physical strength and self-confidence while learning fun performing arts skills. Students will participate in a wide range of activities including yoga, folk and modern dance, creative movement and music exercises with the goal of improving cardiovascular endurance, flexibility and overall fitness. **This course will satisfy PE credit but will not count towards the required MSMS 13 credits.**

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **FA 565 – Special Topics in Music**

This course is based on individual student interest and may be offered on a rotating basis.

Prerequisite: Consent of instructor  
Credit: ½ (elective credit beyond the required 13.0)  
Length: 1 semester

# FOREIGN LANGUAGE

## Introduction

All MSMS graduates must have successfully completed two years of high school foreign language study, with both credits being in the same language. Those who choose to complete the requirement at MSMS can select from courses in five languages: French, German, Latin, Russian, and Spanish. Foreign language courses offer a strong background in vocabulary, grammar, reading, translation, and pronunciation skills, which will enhance the success of college-bound students in university foreign language courses as well as lay the framework upon which students who travel abroad may sharpen their conversational skills. Emphasis is also placed on the understanding and appreciation of the culture of the target country.

## Guidelines for Foreign Language Required Courses

Students who have never earned credit in a foreign language course before entering MSMS, **must earn 2 foreign language credits during the junior and senior years.**

**A majority of out-of-state universities require that the two credits of foreign language be in the same language. (example: Spanish I and II) In order for a student to enroll in two different languages concurrently approval must be obtained from the Academic Director.**

## Objectives

Within the study of foreign languages, the student will be equipped:

- 1) To understand and speak, at a beginning level, at least one foreign language;
- 2) Understand the differences between their own culture and that of others;
- 3) To have a heightened awareness and comprehension of their own native tongue; and
- 4) To realize the importance of the study of language and culture as they relate to their country's needs in commerce, diplomacy, defense, and education.

## FRENCH

### FL 801 – French I

This course introduces the student to the language and culture of the French speaking world. The language skills of listening, speaking, reading, and writing will be developed in simple French. Students will learn to communicate in situations involving greetings, describing people and relationships, school, basic purchasing and asking for help, and leisure activities. Students will learn to speak using present tense, past tense, and the near future.

Prerequisite: None  
Credit: 1  
Length: 1 year

### **FL 802 – French II**

This course continues the study of the basic structures of both the oral and written French language. It includes a continuing review of the important elements learned in French I, while introducing additional verb tenses and pronoun groups.

Prerequisite: French I  
Credit: 1  
Length: 1 year

### **FL 803 – French III**

French III focuses on strengthening the skills gained in French I and II. Important components of the course include vocabulary expansion, reading from French literature and culture, listening to recordings of native speakers, oral practice, and carefully guided written composition. A small number of new structures are introduced, and brief reviews of previously-learned vocabulary and grammar are conducted as needed.

Prerequisite: French I and II  
Credit: 1  
Length: 1 year

## **SPANISH**

### **FL 811 – Spanish I**

In Spanish I students learn the basics of Spanish grammar and begin their acquaintance with the history, geography and culture of Spanish-speaking countries. Lessons and activities focus on developing initial skills in listening, speaking, reading and writing in simple situations involving friends, family, school and leisure.

Prerequisite: None  
Credit: 1  
Length: 1 year

### **FL 812 – Spanish II**

Spanish II builds on skills acquired in Spanish I by adding new vocabulary, verb tenses and pronoun groups. Through exercises including situational dialogues and games of grammar, students expand their repertoire to communicate in scenarios such as traveling, seeking medical help, and shopping for clothes or food.

Prerequisite: Spanish I  
Credit: 1  
Length: 1 year

Additional years of a Foreign Language may be taken with permission of the Director for Academic Affairs and the Language faculty as dual enrollment with MUW. These hours will not count as the MSMS 13 required credits. Students will work with their academic counselor to ensure these courses are offered and will fit into the existing student schedule. Cost of the textbook will be the responsibility of the student.



## LATIN

### FL 821 – Latin I

In this introductory course, students will acquire a basic Latin vocabulary and understanding of Latin grammar that will expand their English vocabulary, particularly in terms used in science, law, and SAT/ACT preparation, and improve students' understanding of English grammar and writing ability. There will also be discussion of Roman culture and mythology, including individual projects where students are free to explore topics of interest.

Prerequisite: None  
Credit: 1  
Length: 1 year

### FL 822 – Latin II

Latin II students will continue with grammar and vocabulary, leading to a solid basis of knowledge in the language and translation of some basic original texts in Latin. Emphasis the second semester will be on the Latin roots of English words in math, science, and government. Students will also learn about Roman culture and history, its famous people and accomplishments.

Prerequisite: Latin I  
Credit: 1  
Length: 1 year

## GERMAN

### FL 831 – German I

This course introduces the student to the language and culture of German-speaking world. All the languages skills of listening, speaking, reading, and writing will be developed in simple German. Students will learn to communicate in situations involving greetings, describing people and relationships, school, basic purchasing and asking for help, and leisure activities. Students will learn to speak using present tense and past tense.

Prerequisite: None  
Credit: 1  
Length: 1 year

### FL 832 – German II

This course continues the study of the basic structures of both the oral and written German language. It includes a continuing review of the important elements learned in German I, while introducing additional verb tenses, pronoun groups, and elements of the case structure. An emphasis is placed on understanding both written and spoken German.

Prerequisite: German I  
Credit: 1  
Length: 1 year

## RUSSIAN

### **FL 845 – Russian I**

This course introduces students to the Russian language and the history, geography and culture of the Slavic world. All language skills -- listening, speaking, reading, and writing -- will be developed to enable the student to communicate at a basic level in situations involving family, friends and school. Study of grammar and pronunciation is enhanced through memorization and performance of simple dialogues, songs and poetry.

Prerequisite: None  
Credit: 1  
Length: 1 year

### **FL 846 – Russian II**

This course continues the study of the basic structures of both oral and written Russian. It includes a continuing review of the important elements learned in Russian I, while introducing new vocabulary, additional elements of the case structure and additional verb forms. All language skills -- listening, speaking, reading, and writing -- will be developed. Textbook and conversational exercises will be supplemented with study of Russia's splendid fairy tales, folk songs and poetry.

Prerequisite: Russian I  
Credit: 1  
Length: 1 year

# INTERDISCIPLINARY COURSES

## Introduction

The world today is composed of interrelated social, biological, physical, and technological systems that are inherently complex. One of the objectives is to provide students with an avenue to explore connections between seemingly divergent topics. The interdisciplinary courses described below are designed to give students a foundation for developing skills that will allow them to become effective problem solvers.

### ID 145 – Introduction to American Film

This course is a study of the development of cinematic techniques and ideals in twentieth-century America. Successful students will complete outside readings, will respond to the literature through critical essays and timed examinations, and will participate in class. (Please note that this course is an elective.)

Prerequisite: None  
Credit: ½ (elective)  
Length: 1 semester

### ID 160 – Foundations of Western Thought

Students will read and discuss selected works of some of our culture's most influential intellectual figures. The development of philosophical traditions will be traced beginning with Plato, Aristotle, Epicurus, Zeno, and Augustine, continuing through Rousseau, Kant, Nietzsche, Freud, and Sartre.

Prerequisite: None  
Credit: ½ (elective)  
Length: 1 semester

### ID 180 – Health

This course will cover the mental, emotional, and social health of the individual. It also studies stress and means of handling life. The course is an outstanding study for the improvement of the quality of health. It includes 10 lessons and 2 tests and is an **on-line course**. Students who have not taken health prior to attending MSMS, must complete health by the end of their junior year.

Prerequisite: None  
Credit: ½  
Length: 1 semester

Note: Health will not count toward the 13 MSMS required credits.

### ID 170- 3D Modeling

The purpose of this class is to provide students with an introduction to computer aided design (CAD) concepts and to develop critical thinking and problem solving skills. The course will use the website Onshape.com to create 3D models.

Prerequisite: None  
Credit: ½ (elective credit)  
Length: 1 semester

# MATHEMATICS

## Introduction

Mathematics has a long impressive record of contributions to discovery and problem solving in science and technology, decision making in business and government, and creative expression in the arts. This record of achievement has earned mathematics a prominent place in school curricula. We live in a world where the emphasis has shifted the demands of mathematics to prepare technologically advanced students who can solve real-world problems and who can communicate those solutions. The Mississippi School for Mathematics and Science mathematics curriculum emphasizes exploration, investigation, reasoning, and communication for all students.

## Guidelines for Mathematics Required Courses

Minimum requirements for graduation: Foundations (0.5) or department approval for accelerated study (Approval for accelerated study will be based on home school course work, pre-test score, and ACT Math score. These students will take AP Statistics Part 1 and Math Lab during the 1<sup>st</sup> semester of junior year); one semester Calculus (0.5); and one semester of Statistics (0.5). Students must complete a minimum of 2 credit hours of mathematics courses. The calculus sequence (Foundations/Pre-Calculus, Trigonometry, AP Calculus I) should be taken in consecutive semesters.

**Requirements for Graduation with a Concentration in Mathematics:** The Concentration in Mathematics is designed for students who pursue an advanced plan of study in mathematics while attending MSMS. Students who shall have completed 3.0 approved mathematics Carnegie Units with an A-average while attending MSMS shall qualify. The Mathematics Department and Director for Academic Affairs shall determine which courses meet approval. The Concentration in Mathematics is awarded to qualified students whose applications are approved by the Director for Academic Affairs.

Requirements for a Concentration in Mathematics:

- Complete Graduation requirements with an A-Average in Mathematics
- Calculus II or higher
- AP Statistics II
- 1.0 additional Carnegie Unit in Mathematics which may be Calculus 3 (0.5) Differential Equations (0.5); Math Modeling (0.5), Discrete Mathematics (0.5); Intro to Programming (0.5); Linear Algebra (0.5) other course work must have department approval.

Students applying for the recognition and who meet the approved criteria will be awarded a seal on the MSMS Diploma indicating successful completion of the Concentration in Mathematics, and the final MSMS transcript will reflect graduation with Concentration in Mathematics.

## Objectives

In an effort to implement the National Council of Teachers of Mathematics Standards and the Mississippi College and Career Readiness Standards the mathematics curriculum objectives are:

- 1) To utilize methods of mathematical modeling and problem solving.
- 2) To provide opportunities for reinforcement and extension of logical reasoning and higher-order thinking skills.
- 3) To encourage investigations of the connections among various mathematical topics and their applications.

Special emphasis is placed on writing, research, appropriate use of technology, and student-designed projects in order to enhance the implementation of the department's curricular goals.

**All students must have earned credit of Algebra I, and Geometry, or Integrated Math I and II before entering MSMS.** If a student does not have a credit for Geometry, the student must take a Geometry course either by correspondence, virtual school or summer school offerings. This credit must be earned before the beginning of the school year. A course in Geometry will not be taught at MSMS.

### **MA 211 – Accelerated Algebra II (Juniors)**

Accelerated Algebra II is the full Algebra II course covered in one semester. The course is a continuation and extension of the concepts developed in Algebra 1 and Geometry. Topics include: simplifying expressions, solving equations, analyzing functions, and matrices. This course fulfills the requirement for Algebra II or Integrated Math III.

Prerequisite: Algebra I and Geometry (or equivalent)  
Credit: 1  
Length: 1 semester

### **MA 221 – Advanced Math Plus: Trigonometry (Spring only)**

This course provides a comprehensive study of trigonometric functions with an emphasis on application. Topics will include circular functions and their graphs, triangle trigonometry, identities and equations, and vectors. **Trig may be taken along with or after Foundations, but should NOT be taken prior to Foundations. This course covers the trigonometry standards from the Advanced Math Plus Course.**

Prerequisite: Geometry and Algebra II (or equivalent)  
Corequisite: Foundations  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 232 – Advanced Math Plus: Foundations for Higher Mathematics (Juniors)**

Solving real-world problems frequently requires advanced statistical and mathematical techniques. This course provides the foundations for these techniques while providing a hands-on approach to many such problems. Concepts required for both Calculus and Statistics will be thoroughly developed.

Individual and team skills will be enhanced as the students investigate models, perform experiments and analyze data. All students are required to take either MA 232 or receive department approval for accelerated study. This course covers the pre-calculus objectives from the Advanced Math Plus course. This course includes a lab.

Prerequisite: Geometry, Algebra II, or equivalent  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 221 – Advanced Math Plus: Foundations with Trigonometry (Juniors- fall only)**

Solving real-world problems frequently requires advanced statistical and mathematical techniques. In addition, this course provides a comprehensive study of trigonometric functions with an emphasis on application. Topics will include circular functions and their graphs, triangle trigonometry, identities and equations, and vectors. This course provides the foundations for these techniques while providing a hands-on approach to many such problems. Concepts required for both Calculus and Statistics will be thoroughly developed.

Individual and team skills will be enhanced as the students investigate models, perform experiments and analyze data. All students are required to take either MA 232 or receive department approval for accelerated study. This course covers the pre-calculus objectives from the Advanced Math Plus course. This course includes a lab.

Prerequisite: department approval  
Credit:  $\frac{1}{2}$   
Length: 1 semester

## CALCULUS

### **MA 244 – AP Calculus I (2<sup>nd</sup> Semester Juniors, Seniors)**

This course is a thorough treatment of differential calculus including the concepts of limits, continuity, derivatives and application of derivatives. This course follows an AP AB and BC Calculus Syllabus. (Not open to first semester juniors)

Prerequisites: Trigonometry, Foundations or  
math department approval  
Credit:  $\frac{1}{2}$  MSMS  
Length: 1 semester

### **MA 244 –University Calculus I (2<sup>nd</sup> Semester Juniors, Seniors)**

This course is a thorough treatment of differential calculus including the concepts of limits, continuity, derivatives and application of derivatives. University credit will be given through the Mississippi University for Women. (Not open to first semester juniors)

Prerequisites: Trigonometry, Foundations or  
math department approval  
Credit:  $\frac{1}{2}$  MSMS  
Length: 1 semester

### **MA 244 –University Calculus I (2<sup>nd</sup> Semester Juniors, Seniors)**

This course is a thorough treatment of differential calculus including the concepts of limits, continuity, derivatives and application of derivatives. University credit will be given through the Mississippi University for Women. (Not open to first semester juniors)

Prerequisites: Trigonometry, Foundations or  
math department approval  
Credit:  $\frac{1}{2}$  MSMS  
Length: 1 semester

### **MA 257 – AP Calculus BC (Juniors and Seniors by instructor approval only)**

This course is a thorough treatment of differential calculus including the concepts of limits, continuity, derivatives and application of derivatives. This course is a thorough treatment of integral calculus including Riemann sums, applications of integrals and techniques of integration, as well as the calculus of transcendental functions. This course extends the techniques of differential and integral calculus to the study of polar and parametric equations, along with vector-valued functions of several independent variables. There is a thorough coverage of infinite series including Taylor Series. This course is intended to prepare students who demonstrate high proficiency Pre-Calculus and Trigonometry.

Prerequisites: Foundations and Trigonometry (or equivalent) with an A and math department approval  
Credit: 1 MSMS  
Length: 2 semesters

### **MA 251 – AP Calculus II**

This course is a thorough treatment of integral calculus including Riemann sums, applications of integrals and techniques of integration, as well as the calculus of transcendental functions. This course follows an AP AB and BC Calculus Syllabus. Completion of this course prepares students to take the AP AB Calculus Test.

Prerequisites: AP Calculus I with a grade B or above, or math department approval  
Credit:  $\frac{1}{2}$  MSMS  
Length: 1 semester

### **MA 248– University Calculus II**

This course is a thorough treatment of integral calculus including Riemann sums, applications of integrals and techniques of integration, as well as the calculus of transcendental functions. University credit will be given through the Mississippi University for Women.

Prerequisites: AP Calculus I with a grade B or above, or math department approval  
Credit:  $\frac{1}{2}$  MSMS  
Length: 1 semester

### **MA 259 – AP Calculus III**

This course extends the techniques of differential and integral calculus to the study of polar and parametric equations, along with vector-valued functions of several independent variables. There is a thorough coverage of infinite series including Taylor Series. This course follows an AP BC Calculus Syllabus. Completion of this course prepares students to take the AP BC Calculus Test.

Prerequisite: AP Calculus II with a grade B or above or math department approval  
Credit:  $\frac{1}{2}$  MSMS  
Length: 1 semester

## **STATISTICS**

### **MA 270 – AP Statistics Part 1**

This course is a study of descriptive statistics, probability concepts, normal distributions, regression models, design of experiments, and an introduction to inferential statistics. Use of technology will be integrated throughout the course. Unlike Statistics I, this course is designed as preparation for the AP exam in Statistics and is meant to precede AP Statistics II. *Note: Both AP Statistics Part 1 and AP Statistics Part 2 are required to receive AP credit.*

Prerequisite: Senior standing or instructor approval,  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 272 – AP Statistics Part 2**

A study of confidence intervals, hypothesis testing, statistical inference, regression analysis, and analysis of variance, this course uses in-depth investigations with descriptive and inferential statistics. Students will complete a final project in which they design a study, collect and analyze data, and present a summary of their findings.

Prerequisite: MA 270 AP Statistics Part 1  
Credit:  $\frac{1}{2}$   
Length: 1 semester

## **MATHEMATICS ELECTIVES**

### **MA 236 – Math Modeling (Fall only)**

Students investigate, find models, determine strengths and weaknesses of models and create summaries of their findings. The topics include techniques that would better prepare students for the Math Modeling Competition as well as AMC12. This course is recommended for students interested in applied math or engineering.

Prerequisites: Geometry, Algebra II, Foundations or its equivalent, and/or math department approval  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 254 – Differential Equations (Spring only)**

This course will provide an investigation of differential equations through analytical techniques and numerical methods. Applications will be stressed throughout so that the interrelationship of pure mathematics, modeling and the physical sciences may be developed. Technology will play a significant role as students will be required to use MAPLE and EXCEL. Major topics include first order, second order, and systems of differential equations.

Prerequisite: Calculus II or consent of instructor  
Corequisite: AP Calculus III  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 264 – Logic and Game Theory (Spring only)**

This course is a study of logic, symbolic notation, truth tables, simple game theory, and problem-solving strategies.

Prerequisite: Foundations(or equivalent), Trigonometry  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 280 – Discrete Mathematics through Mathematics Computing (Spring only)**

Discrete Mathematics is an introduction to the mathematical foundations of Computer Science, with a focus on logic and mathematical reasoning. Topics will include logic, proofs, combinations and number theory. An emphasis will be placed on solving problems using the Python Programming language..



Prerequisite: Foundations (or equivalent), Trigonometry  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 263– History of Mathematics (Spring only)**

The course explores some of the major developments in mathematics history in the context of various civilizations: Babylonian, Egyptian, Greek, Chinese, and Western. Topics covered include number systems and computational techniques as well as achievements in elementary algebra, geometry, number theory, and calculus. An emphasis is placed on solving famous problems in the style and culture of each civilization.

Prerequisite: Foundations (or equivalent), Trigonometry  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 257 – Linear Algebra (Spring Only)**

This course is a study of systems of linear equations, matrices, dot products, cross products, determinants, vector spaces, linear transformations, inner product spaces, eigenvalues, eigenvectors, diagonalization, orthogonality and the QR and singular value decompositions. Applications may include least-squares, Markov chains, systems of linear differential equations and topics in Numerical Linear Algebra.

Co-requisite: Calculus II (or equivalent), or Consent of Instructor  
Credit:  $\frac{1}{2}$   
Length: 1 semester

### **MA 290 – Special Topics in Mathematics**

Independent study includes examination and discussion of mathematical topics outside the standard curriculum. This is for advanced students or students with special needs.

Prerequisite: Consent of instructor, permission of Director for Academic Affairs  
Credit:  $\frac{1}{2}$  (elective credit beyond required 13.0)  
Length: 1 semester

# SCIENCE

## Introduction

The purpose of the science department of the Mississippi School for Mathematics and Science is to give students a broad overview of the sciences and to make them scientifically literate in each of the major subject areas: biology, chemistry, and physics. Emphasis is placed on mastery of basic concepts and laboratory skills through course lectures and discussions, laboratory investigations, field trips, tours, special projects, guest lecturers, and direct involvement with researchers at the college level. Students are given the opportunity to pursue their particular interests through elective courses and independent research.

### Guidelines on Required Science Courses

In general, students complete two credits of science during the junior year and the third credit of science and one-half swing credit during the senior year (or some variation of this sequence). The objective is to achieve a balance throughout your two years at MSMS.

All students are required to earn a minimum of three credits in science by successfully completing one credit each in Biology, Chemistry and Physics **at MSMS**.

- (1) Biology - Course selection may be determined by student interest and career plans. All students will take Cell Biology or AP® Biology which are prerequisites for all other biology courses.
- (2) Chemistry – Students who have not completed a year of chemistry at their home school must enroll in SC366 Properties of Matter (fall), SC367 Chemical Reactions (spring), or AP Chemistry
- (3) Physics - All students must successfully complete **AP® Physics 1** before graduation. Students who wish to experience the most rigorous first-year physics program offered at MSMS should enroll in **Advanced Problems in 1<sup>st</sup> Year Physics** concurrently with **AP® Physics 1**.

Students who wish to take 2<sup>nd</sup> year physics courses at MSMS must complete AP® Physics 1 during the junior year. Juniors with sub-scores ACT-Math $\geq$ 25 and ACT-Reading $\geq$ 22 are strongly encouraged to enroll in physics during the junior year.

### Objectives

- 1) To prepare the student for success in college, specifically in the sciences.
- 2) To teach content so as to encourage critical thinking and the application of scientific principles to problem solving.
- 3) To prepare the student to read and appreciate scientific literature.
- 4) To prepare the student to be able to make intelligent choices concerning scientific issues.

## BIOLOGY COURSES

**Requirements for Graduation:** All students are required to complete successfully one full year of biology for 1 full CU (two semesters).

**Requirements for Graduation with Concentration in Biology:** The Concentration in Biology is designed for students who pursue an advanced plan of study in biology while attending MSMS. The Concentration in Biology helps colleges identify MSMS graduates with advanced preparation in biology and who might benefit from placement in higher level coursework at the college level. Students who shall have completed 2.5 approved biology Carnegie Units with a B-average in each course or higher while attending MSMS shall qualify. The Biology Department and Director for Academic Affairs shall determine which courses meet approval. The Concentration in Biology is awarded to qualified students whose applications are approved by the Director for Academic Affairs. The approved courses for the Concentration in Biology shall include:

- 1.0 Carnegie Unit **AP® Biology**
- Additional 1.5 Carnegie Units (three semester courses) which may include **Microbiology** (0.5 CU), **Animal Physiology** (0.5 CU), **Plant Physiology** (0.5 CU), **Human Infectious Disease** (0.5 CU), or **Introduction to Biochemistry** (0.5 CU).

Other course work may not be substituted. Students applying for the recognition and who meet the approved criteria will be awarded a seal on the MSMS Diploma indicating successful completion of the Concentration in Biology, and the final MSMS transcript will reflect graduation with Concentration in Biology.

### Guidelines for Required Biology Courses

Course selection may be determined by student interest and career plans. All biology courses are laboratory based and meet four or five days per week. AP course may meet five days per week.

#### SC 310 – AP Biology

Advanced Placement Biology is an intensive year-long course designed to equip students with the skills, knowledge, and abilities to achieve a high score on the College Board's AP Biology Exam. AP Biology has at its core four central themes: Evolution, Cellular Processes: Energy and Communication, Genetics and Information Transfer, and Interactions. A minimum of 12 inquiry-based labs supplement and enhance the course material. Students should expect to spend at least 1.5 hours of study for every hour in lecture. This is typically a course for juniors. Seniors would need the permission of a faculty member to enroll.

Prerequisite: Appropriate score on MSMS Biology Placement Test  
Credit: 1(biology)  
Length: 1 year

#### SC 312 – Cell Biology

This course involves the study of the biology of cells from the molecular to the microscopic level of organization. Prokaryotic and eukaryotic cells will be considered. Cellular architecture and physiology will be considered in the context of biological macromolecules and their building blocks.

Prerequisite: None  
Credit: ½ (biology)  
Length: 1 semester

### **SC 313 – Microbiology**

Microbiology is the study of microorganisms; this class focuses predominantly on bacteria emphasizing central themes of cellular biology and the scientific method. This course is a laboratory-based course (lectures are integrated with labs) in which the students learn the fundamental techniques of the discipline. In the latter part of the semester, the students are required to do an intensive independent project of their design that applies the techniques they have learned.

Prerequisite: Cell Biology or first semester of AP® Biology  
Credit: ½ (biology)  
Length: 1 semester

### **SC 316 - Animal Physiology**

Animal physiology is a survey of various physiological processes in animals (primarily vertebrates). Topics include muscle physiology, respiration and circulation, digestion, metabolism and nutrition, kidney function and system integration.

Prerequisite: Successful completion of cell biology or first semester of AP Biology  
Credit: ½ (biology)  
Length: 1 semester

### **SC 318 – Genetics**

This course is a study of the principles of heredity and the nature of genetic material. It is divided into three sections: Mendelian genetics, Molecular genetics, and Population genetics. This course is presented in the context of evolutionary biology. It also serves as an introduction to recombinant DNA technology and addresses the current social, legal, and ethical issues raised by these modern molecular techniques. AP® Biology students may not enroll in Genetics.

Prerequisite: Cell Biology  
Credit: ½ (biology)  
Length: 1 semester

### **SC 320 – Ecology of Environmental Problems**

This course examines environmental problems from an ecological perspective. Initially, the course considers the relationships between organisms and their environment; an introduction to the physiological bases for adaptations, population dynamics (both human and non-human), community organization; and the structure and function of ecosystems (including atmosphere, climate, and weather). Interdisciplinary methods of analysis will be used to explore natural systems while scrutinizing resource management strategies, pollution, economic factors (local and global), and the politics of environmental problems.

Prerequisite: Cell Biology or first semester of AP® Biology Credit: ½ (biology)  
Length: 1 semester

### **SC 323 -- Introduction to Public Epidemiology**

This course provides an introduction to public health and covers the sciences essential to public health practice. The fundamental scientific components span topics in the historical development of public health services, epidemiology, public health informatics and surveillance, health economics, public health laboratory science, and related fields. Students will be introduced to the world's vast diversity of

determinants of health and disease. They will analyze current and emerging global health priorities, including emerging infectious diseases, poverty, conflict and emergencies, and major global initiatives for disease prevention and health promotion. Students will be engaged in active, critical thinking skills through group discussion, class activities and laboratory work, and will end with a capstone project to be presented to a panel made up of peers, teachers, and administrators. A field trip to the CDC is tentatively planned.

Prerequisite: Cell Biology of 1<sup>st</sup> Semester or AP Biology  
Credit: ½ (biology)  
Length: One Semester course

### **SC 360 – Introduction to Biochemistry (Seniors)**

This is a senior-level course designed as an intensive survey of biological molecules-proteins, nucleic acids, lipids and carbohydrates. The major emphasis will be on proteins, but a portion of the course will also be dedicated to nucleic acid, lipid and carbohydrate structure, and metabolism.

Prerequisite: One year of Chemistry at MSMS and Cell Biology, or AP Bio and consent of instructor; Organic Chemistry is recommended  
Credit: ½ (chemistry or biology)  
Length: 1 semester

### **SC 324 – Special Topics in Biology**

This course is designed to give students an opportunity for individualized learning in biology. The student will select faculty advisors and with their help, choose a particular biology problem of interest and pursue the problem.

Prerequisite: Consent of the instructor  
Credit: ½ (elective credit beyond the 13.0 required)  
Length: 1 semester (with the option to repeat the course for another ½ credit)

## CHEMISTRY COURSES

**Requirements for Graduation:** All students are required to successfully complete one full year of chemistry for 1 CU (two semesters) at MSMS. Students will complete either the two semester sequence of Properties of Matter ( $\frac{1}{2}$  CU) and Chemical Reactions ( $\frac{1}{2}$  CU) or AP<sup>®</sup> Chemistry (1 CU) to fulfill the requirement.

**Requirements for Graduation with Concentration in Chemistry:** The Concentration in Chemistry is designed for students who pursue an advanced plan of study in chemistry while attending MSMS. The Concentration in Chemistry helps colleges identify MSMS graduates with advanced preparation in chemistry and who might benefit from placement in higher level coursework at the college level. Students who shall have completed 2.5 approved chemistry Carnegie Units with a B-average in each course or higher while attending MSMS shall qualify. The Chemistry Department and Director for Academic Affairs shall determine which courses meet approval. The Concentration in Chemistry is awarded to qualified students whose applications are approved by the Director for Academic Affairs. The approved courses for the Concentration in Chemistry shall include:

- 1.0 Carnegie Unit **AP<sup>®</sup> Chemistry**
- Additional 1.5 Carnegie Units (three semesters), which must include three of the following courses: **Organic Chemistry** (0.5 CU), **Introduction to Biochemistry** (0.5 CU), **Analytical Chemistry** (0.5 CU), **Physical Chemistry** (0.5 CU).

Other course work may not be substituted. Students applying for the recognition and who meet the approved criteria will be awarded a seal on the MSMS Diploma indicating successful completion of the Concentration in Chemistry, and the final MSMS transcript will reflect Graduation with the Concentration in Chemistry.

### **SC 366 – Properties of Matter (Fall only)**

Properties of Matter is an in-depth study of the skills and theoretical frameworks of chemistry. Measurement, atomic and molecular structure, stoichiometry, bonding, periodicity and the periodic table, and nomenclature will be studied with an emphasis on the mathematics of chemistry including dimensional analysis and problem solving.

Prerequisite: None  
Credit:  $\frac{1}{2}$  (chemistry)  
Length: 1 semester

### **SC 367 – Chemical Reactions (Spring only)**

Chemical Reactions studies the types of and laws governing the reactions of matter. In particular, students will study solubility and precipitation, gases and gas laws, acids and bases, intermolecular forces, solution chemistry, and a brief introduction to chemical kinetics and thermodynamics. Students entering SC 367 without credit from SC 366 must demonstrate basic proficiency with the topics in SC 366 via placement exam. A strong emphasis will be placed on problem solving and application of skills covered in SC 366.

Prerequisite: Properties of Matter SC 366  
Credit:  $\frac{1}{2}$  (chemistry)  
Length: 1 semester

### **SC 355 – AP<sup>®</sup> Chemistry**

This course provides an in-depth study of the principles of modern chemistry and should prepare the student for the AP<sup>®</sup> exam in chemistry. This course requires several hours of study time beyond that required in other courses as well as a laboratory assignment for each week.

Prerequisite: One year of Chemistry, appropriate score on the chemistry placement test, or  
ACT score of 25 or higher;  
Credit: 1 (chemistry)  
Length: 2 semesters

### **SC 357 – Organic Chemistry (Seniors)**

This course is a senior level course designed to be an introduction to the basic principles of organic chemistry. Topics to be covered include nomenclature, elementary reactions of functional groups, stereochemistry, and isomerism.

Prerequisite: SC 366/367 or SC 355;  
One year of Chemistry; consent of instructor  
Credit: ½ (chemistry)  
Length: 1 semester

### **SC 360 – Introduction to Biochemistry (Seniors, Spring Only)**

This is a senior-level course designed as an intensive survey of biological molecules-proteins, nucleic acids, lipids and carbohydrates and their interactions from a cellular level to an atomic description. The major emphasis will be on proteins, but a portion of the course will also be dedicated to nucleic acid, lipid and carbohydrate structure, and metabolism.

Prerequisite: SC 366/367 or SC 355 and consent of instructor;  
SC 357 is strongly recommended  
Credit: ½ (chemistry or biology)  
Length: 1 semester

### **SC 364 – Analytical Chemistry (Seniors)**

This course is designed to introduce the student to the methods used in the quantitative analysis of chemical compounds. This includes classical gravimetric and volumetric methods as well as modern methods such as spectrometry and chromatography. The course also includes a brief overview of statistical methods used in data analysis. The class is primarily lab-based, but does include some out-of-class work. The class is a senior level course and is offered in the spring semester.

Prerequisite: SC 366/367 or SC 355; consent of instructor  
Credit: ½ (chemistry)  
Length: 1 semester

### **SC 365 – Physical Chemistry (Seniors)**

This is a senior-level course designed to introduce the student to the laws of thermodynamics as they relate to chemical systems and chemical reactions. This includes considerations of enthalpy and entropy, with a primary focus on chemical and physical equilibria. The course includes both a lecture/discussion and a laboratory component. The course is offered in the spring semester.

Prerequisite: SC 366/367 or SC 355; and consent of instructor

Credit:  $\frac{1}{2}$  (chemistry)

Length: 1 semester

### **SC 325 – Special Topics in Chemistry (Seniors)**

This course is designed to give the student an opportunity to for individualized learning in chemistry. The student will select faculty advisors and with their help, choose a particular problem of interest in chemistry and pursue the problem.

Prerequisite: Consent of the instructor

Credit:  $\frac{1}{2}$  (elective credit beyond 13.0 required)

Length: 1 semester (with option to repeat for another  $\frac{1}{2}$  credit)



## PHYSICS COURSES

**Requirements for Graduation:** All students are required to complete successfully the AP<sup>®</sup> Physics-1 course for 1 CU (two semesters).

**Requirements for Graduation with Concentration in Physics:** The Concentration in Physics is designed for students who pursue an advanced plan of study in physics while attending MSMS. The Concentration in Physics at MSMS helps colleges identify MSMS graduates with advanced preparation in physics and who might benefit from placement in higher level coursework at the college level. Students who shall have completed 3.0 approved physics Carnegie Units in physics with a minimum B-average in each course or higher while attending MSMS shall qualify. The Physics Department and Director for Academic Affairs shall determine which courses meet approval. The Concentration in Physics is awarded to qualified students whose applications are approved by the Director for Academic Affairs. The approved courses for the Concentration in Physics shall include:

- 1.0 Carnegie Unit **AP<sup>®</sup> Physics-1**
- 0.5 Carnegie Unit **Advanced Problems in 1st Year Physics** (required)
- Additional 1.5 CU's (three semesters) which may include **Thermodynamics/E&M** (0.5 CU), **Modern Physics** (0.5 CU), **AP<sup>®</sup>C Mechanics** (0.5 CU), **AP<sup>®</sup>C E&M** (0.5 CU).

Other course work may not be substituted. Students applying for the recognition and who meet the approved criteria will be awarded a seal on the MSMS Diploma indicating successful completion of the Concentration in Physics, and the final MSMS transcript will reflect graduation with Concentration in Physics.

### SC 330 - AP<sup>®</sup>Physics-1

AP<sup>®</sup>Physics-1 is an algebra and trigonometry based course which provides a college-level introduction to the principles of Newtonian mechanics including rotational motion. The course is designed to be equivalent to a university's first semester of introductory algebra-based physics. Successful completion of this course will provide the student with a solid foundation in the topics of kinematics, work, energy, power, mechanical waves and sound, and an introduction to circuits. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences. This lab-based course is designed to prepare students to take the AP Physics 1 examination administered in May.

Credit: 1 unit AP<sup>®</sup> credit  
Pre- or Co-req: Trigonometry or Foundations of Math  
Length: 1 year

### SC 333 - Advanced Problems in 1st Year Physics

Advanced Problems in 1st Year Physics taken co-requisite with AP<sup>®</sup> Physics-1 comprises the most rigorous first-year physics program offered at MSMS. This course meets one day per week for the full year.

Credit: ½ unit non- AP<sup>®</sup> credit  
Pre-or Co-req: AP Physics I  
Length: 1 year

### SC 434 – Fluids, Thermodynamics, & Optics

This algebra- and trigonometry-based course covers some 1<sup>st</sup> semester topics commonly presented in AP<sup>®</sup> Physics-2. Successful completion of this course will provide the student with a solid foundation in the topics of fluid statics and dynamics, thermodynamics, kinetic theory, PV diagrams and probability, and light reflection/refraction. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences. This course is offered in the spring semester to qualified AP<sup>®</sup> Physics 1 students and students who have successfully completed AP<sup>®</sup> Physics 1.

Credit: ½ unit non-AP<sup>®</sup> credit  
Pre- or Co-req: AP<sup>®</sup> Physics 1, or B average or higher in first semester AP<sup>®</sup> Physics 1  
if taken concurrently with second semester AP<sup>®</sup> Physics 1  
Length: 1 semester

### SC 339 – Modern Physics

This algebra and trigonometry-based course covers the 2nd semester topics of the AP<sup>®</sup> Physics-2 course. Successful completion of this course will provide the student with a solid foundation in the topics of special relativity, electromagnetic waves, physical and geometrical optics, introductory atomic and quantum theory, nuclear physics and an introduction to general relativity. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences. This course is offered in the fall semester to students who have successfully complete AP Physics I.

Prerequisite: AP<sup>®</sup> Physics-1;  
Co-requisite: Advanced Problems in 1<sup>st</sup> year  
Physics  
Credit: ½ unit non AP<sup>®</sup> credit  
Length: 1 semester

### SC 337 - AP<sup>®</sup> Physics C: Mechanics

The course provides students with a vector-calculus based introduction to the principles of classical mechanics. Both differential and integral calculus concepts will be utilized throughout the course. Topics include kinematics, Newton's Laws, collisions and conservation laws, work and energy, rotational motion, statics, harmonic motion, gravitation and other topics as well. This lab-based course is designed to prepare students to take the AP<sup>®</sup> Physics C Mechanics examination, which is administered each May.

Prerequisite: AP<sup>®</sup>Physics-1, or approval of instructor and  
Academic Director;  
Pre or Co-req: Calculus II or equivalent; Advanced  
Problems in 1<sup>st</sup> year Physics  
Credit: ½ AP<sup>®</sup> credit  
Length: 1 semester

### SC 338 - AP<sup>®</sup> Physics C: Electricity and Magnetism

The course provides students with a vector-calculus based introduction to the principles of classical electricity and magnetism. Both differential and integral calculus concepts will be utilized throughout the course. The major laws of electromagnetic theory are developed including Coulomb's Law, Gauss' Law, Ampere's Law, the Biot-Savart Law and Faraday's Law, ultimately leading to Maxwell's Equations. The lab-based course is designed to prepare students to take the AP<sup>®</sup> Physics C Electricity & Magnetism examination, which is administered each May.

Prerequisite: AP<sup>®</sup> **Physics C: Mechanics**  
Credit: ½ AP<sup>®</sup> credit  
Length: 1 semester

### **SC 344 – Astronomy/Astrophysics**

The class will introduce the Earth & Moon system, the sky and seasons, the origin of the Solar System, comparative planetology in our Solar System, the varieties of stars and galaxies in the universe, and the life cycle of stars from their formation to destruction. Quantitative topics will include basic physics of orbital mechanics, gravitational forces/acceleration, conservation of momentum, and conservation of energy. The lab component of this course will focus on small group projects and astronomy research. Some nighttime viewing may be required.

Pre-requisite: Algebra 2  
Co-requisite: Trigonometry, or approval of instructor and Academic Director  
Credit: ½ unit non-AP<sup>®</sup> credit  
Length: 1 semester

### **SC 345 – Electronics**

This course is offered to allow students an opportunity to develop expertise in the area of electronics. Assignments will be made from both text and laboratory designs. Students can gain familiarity with microprocessors, digital circuits, and analog circuits in this course. A major part of the grade will be a final project. **(NO LAB DAY)**

Co-requisite: AP<sup>®</sup> Physics-1  
Credit: ½  
Length: 1 semester

### **SC 346 – Special Topics in Physics**

This course is designed to give the student an opportunity for individualized learning in physics. The student will select faculty advisors and with their help, choose a particular physics problem of interest and pursue the problem.

Prerequisite: Consent of instructor and Academic Director  
Credit: ½ (elective credit beyond required 13.0)  
Length: 1 semester (with the option to repeat the course for another ½ credit)

# SOCIAL SCIENCE

## Introduction

The capacity to reason reflectively and constructively concerning the problems of man and his world will be the major goal of instruction in the social sciences. Sub-goals will include providing students with opportunities to acquire depth and precision of understanding in handling concepts and ideas rather than additions to the store of facts. In addition, social science courses will develop the ability to think abstractly, critically, and reflectively with social science data. The social science curriculum will also concern itself with respect for the facts, open-mindedness, and participation in group action of a kind that reflects a desire on the part of the participant to seek solutions to social problems.

**Requirements for Graduation:** U.S. History is required of all students during their junior year unless they earned this credit in grades 9 or 10. Students who have not earned a full credit of World History prior to entering MSMS need to do so during the junior year unless enrolled in U.S. History. If a student requiring World History credit is enrolled in U.S. History junior year, it is recommended they take World History senior year. Additionally students must earn a ½ credit in World Geography, Mississippi Studies, Economics, and American Government prior to graduation. There are a variety of ways to meet this requirement. **American Government is reserved for the senior year.**

## Objectives

Within the study of social sciences, students will be equipped:

- 1) To understand the broad sweep of both ancient and contemporary ideas that have shaped our world;
- 2) To understand the fundamentals of how our economic system works and how our political system functions;
- 3) To grasp the difference between free and repressive societies; and
- 4) To demonstrate this understanding through informed and committed exercise of citizenship.

## SS 600 – United States History: Imperialism to New Frontier

This course surveys United States History from 1877 and fulfills the US History graduation requirement set by the Mississippi State Department of Education. Pursuing a student-centered inquiry approach to History, the course includes, but is not limited to: The Rise to Industrial Supremacy, the Age of the City, the Populist Movement, American Imperialism, the Progressive Movement, America and the Great War, the New Era (“Roaring Twenties”), the Great Depression, the New Deal, the Second World War. The Cold War, the Affluent Society of the 1950’s, the Korean War, the Civil Rights Era – the Early Years, and the Vietnam War – the Early Years. The course will develop primary and secondary source analysis skills. Additionally, courses will include writing that focuses on the production of clear and coherent works, including, but not limited to: writing arguments focused on discipline-specific content and writing informative/explanatory texts, including the narration of historical events.

Prerequisite: None  
Credit: 1 (meets US History 1877-Present graduation requirement)  
Length: 1 year

**SS 601 – United State History: Imperialism to new Frontier  
(Research focus: Architecture)**

This course surveys United States History from 1877 and fulfills the US History graduation requirement set by the Mississippi State Department of Education. Pursuing a student-centered inquiry approach to History, the section includes content covered in SS 600. Additionally, this section includes a study of the development of American architecture. Surveying the variety of architecture styles prevalent in the United States through the first three centuries of the nation's development, students consider these styles as representative cultural expressions which suggest historical responses to aesthetic and cultural conflicts and offer historical insight and understanding. Field studies are included in the course. The course will develop primary and secondary source analysis skills. Additionally, the course will include writing that focuses on the production of clear and coherent works, including, but not limited to: writing arguments focused on discipline-specific content and writing informative/explanatory texts, including the narration of historical events.

Prerequisite: None  
Credit: 1 (meets US History 1877-Present graduation requirement)  
Length: 1 Year

**SS 603 – United States History: Imperialism to New Frontier  
(Research focus: Tales from the Crypt)**

This section includes the award-winning "Tales from the Crypt" research/performance project. Students conduct primary and secondary research on an individual buried in Historic Friendship Cemetery. After completing a research paper, students develop dramatic vignettes performed during candlelight cemetery tours in the spring.

Prerequisite: None  
Credit: 1 (meets US History 1877-Present graduation requirement)  
Length: 1 Year

**SS 605 – University History of the United States II (College credit)**

University United States History II offers qualifying students an opportunity to receive dual credit in United States History from MSMS (the U.S. History requirement) and from Mississippi University for Women (His 110). This course surveys American History since Reconstruction. It explores the political, social, cultural, and economic forces at work in creating modern America. Special attention is given to Americans' experience in war, civil rights for African-Americans, and the changing status of women.

Prerequisite: Admission to MUW and a composite score of 25 on the ACT OR permission of Director for Academic Affairs  
Credit: 1 (meets US History 1877-Present graduation requirement); 3 MUW credits  
Length: 1 year

### **SS 610 – United States History: 60’s – Decade of Change**

This course surveys United States History during the 1960's. Course topics include, but are not limited to Johnson's "Great Society," the Civil Rights Era – the Later Years; the Vietnam War – Intensification and Resolution; the Watergate Crisis. The course will include use of a textbook, lecture, outside readings, current even materials and research projects. **This course does not fulfill the Mississippi State Department of Education U.S. History graduation requirement.**

Prerequisite: None  
Credit: ½ (elective)  
Length: 1 Semester

### **SS 612 – World Geography**

This course focuses on the study of world geography through current world problems. Students study the world's major regions and the United States' role in world affairs while exploring how culture influences the decisions of world leaders and how economics, geography, and history have influenced the political systems of the world. Students also explore the relationship among people, places and environments; the concept of regional identities; the global competition for natural resources; and the modification of our physical environment. The course includes the use of current event materials and a variety of research tools. This course meets the ½ credit Geography graduation requirement.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **SS 615 – Mississippi Crossroads I: 20th Century Mississippi Cultural Expression**

This course will examine the sources and themes of 20<sup>th</sup> century Mississippi artistic and cultural expression as they emerge from and contribute to a social, historical, political, and cultural milieu. Topics addressed will include the music, history and traditions of the state – including, but not limited to: writers, blues, country, visual arts, politics, agriculture, civil rights issues, race/ethnicity, and more.

Prerequisite: None  
Credit: ½ (elective or may be used to complete *Mississippi Studies* requirement)  
Length: 1 semester

### **SS 625 – Modern European History**

Course includes, but is not limited to study of the Black Death, the Renaissance including art and music, the Age of Exploration, the Reformation, the English Civil War, Scientific Revolution, French Revolution, Napoleon, Imperialism, and WWI. The course will include use of a textbook, lecture, outside readings, current event materials, field trips, and research projects. This course meets the World History requirements set by the Mississippi State Department of Education.

Prerequisite: None  
Credit: 1 (meets World History graduation requirement)  
Length: 1 year

### **SS 626 –University History of Civilization (College credit)**

History of Civilization offers qualifying students an opportunity to receive dual credit in World History from MSMS (the World History requirement) and from Mississippi University for Women (His 102). This course surveys the history of civilization from approximately 1300 until the present with an emphasis on the West regarding crucial events, individuals, and institutions. Central goals are to develop the talent to read historical material effectively, formulate clear and coherent arguments, think constructively about historical issues, and transmit ideas through written material.

Prerequisite: Admission to MUW and a composite score of 25 on the ACT OR approval of Director for Academic Affairs  
Credit: 1 (meets World History graduation requirement); 3 MUW credits  
Length: 1 year

### **SS 650 – Economics and Entrepreneurship**

This is an introductory course to the basic principles of macro- and microeconomics and major concepts in entrepreneurship. The first half of the course will focus on important economic concepts and themes, such as (but not limited to) scarcity, supply and demand, production, national income, inflation, GDP, the cost of living, monetary policy, and personal finance. The goal is to equip students with some of the necessary tools to make sound economic decisions and be better consumers, employees, investors, and citizens. The second half of the course will build on the first half and introduce students to principles of entrepreneurship. These tools are meant to instill in students the possibility and feasibility of starting their own business.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **SS 655 – American Government (Seniors Only)**

This course will include a thorough study of the constitution and the amendments as well as the three branches of government. The course will focus on political decision making and include selected Supreme Court decisions as well as other documents illustrating the processes of government. The course will include the use of a textbook, lecture, outside readings, and current event materials.

Prerequisite: None  
Credit: ½  
Length: 1 semester

### **SS 665 – African American History**

This course examines the History of persons of African descent in North America from the colonial period through the twentieth century. Pursuing a student-centered inquiry approach to History, the course includes, but is not limited to: African cultural heritage, slavery, the Civil War and Reconstruction, the era of Jim Crow segregation, the Civil Rights Era, and African American contributions to American culture. Additionally, this course will include the “Eight of May Emancipation Celebration” research/performance/community service project. The course will develop primary and secondary source analysis skills. Additionally, the course will include writing that focuses on the production of clear and coherent works, including, but not limited to: writing arguments focused on discipline-specific content and writing informative/explanatory texts, including the narration of historical events.

Prerequisite: None  
Credit: ½ (elective credit)  
Length: 1 semester

## **SS667 World War II**

Course Description: World War II was a conflict like no other in human history. The purpose of this course is to provide the students with a broad view and comprehensive understanding of World War II as a global event. This class will study the causes, the course, and the implications of World War II, this greatest of twentieth century conflicts. It will deal with the war's causes, conduct, and consequences. It will cover the war from the perspective of all the major belligerents, Axis and Allied. It will handle most of the geographic areas involved, the major diplomatic, political and military events, and some of the key figures of the war. It covers the time period of 1918 to 1950, with an emphasis on the years 1939-1945.

Prerequisite: None  
Credit: ½ (elective credit)  
Length: 1 semester

## **SS 690 – Special Topics in Social Science**

This course is based on individual student interest and may be offered on a one-time or rotating basis. It may concentrate on a specific topic.

Prerequisite: None  
Credit: ½ (elective credit beyond required 13.0)  
Length: 1 semester



# SPECIAL STUDY OPTIONS

## Guidelines on Special Study Options

Mentorship, Introduction to Research, and Special Topics courses **are not open to incoming juniors during the fall semester** but may be available to juniors in the spring semester. If you are interested, check with your counselor in the late fall. Mentorship and Research require a 3.0 GPA in MSMS courses for participation.

### MN 101 – Mentorship

This course will provide select students with hands-on experience in a chosen area of work. Students will be placed in an actual work environment in a career field that interests them or an area they will pursue as a college major. Only students who have shown strong commitment to the MSMS ideals of Scholarship, Service, Creativity, and Community and have demonstrated the ability to do exceptional work at MSMS will be placed in mentorship. The student will spend approximately four hours per week with a mentor and attend periodic meetings with other students in the program. **Up to 2 credits of mentorship can be earned at MSMS. However, only the 2<sup>nd</sup> ½ credit will count toward the 13 MSMS required courses.** Course may be repeated.

Prerequisite: Approval of the Director for Academic Affairs  
Credit: ½ (elective)  
Length: 1 semester

### ID 195– Introduction to Scientific Research

Survey of Research provides juniors and seniors with a solid background in the principles and practices of scientific research. Students enrolled in the course will participate in activities meant to equip them with the tools and strategies of a researcher, with the intent of enrolling in the MSMS research program with the placement in a lab in the Spring. (Fall only)

Prerequisite: None  
Credit: ½  
Length: 1 semester

### RE 101- Research Practicum

This course is designed to allow students to conduct scientific research under the combined mentorship of MSMS and Mississippi State University. Students will be paired with university professors to assist with ongoing research projects. Students are expected to attend an orientation session, complete 70 hours of research, and present a poster project of the research conducted.

Prerequisite: RE101 – Intro to Scientific Research or approval of the Director for academic Affairs  
Credit: 1 hour  
Length: 2 semesters