



**THE MISSISSIPPI
SCHOOL FOR
MATHEMATICS & SCIENCE**

2022-2023

COURSE CATALOG

An Opportunity for Excellence

Revised Spring 2022

**Course Catalog
2022-2023**

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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 -- develop a two-year plan of study

The course offerings described in the MSMS Course Catalog have been developed for the 2021-2022 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 2022-2023 MSMS Student Handbook.

SPECIAL ACADEMIC PROGRAMS

Correspondence Courses/Virtual Courses

Mississippi Accountability Standards and MSMS allow no more than one (1) Carnegie unit (CU) 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 period, not exceeding two semesters. **Neither correspondence Carnegie Units nor virtual school Carnegie Units 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, and Engineering 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. 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.

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 few universities, thus impacting eligibility for first-year scholarships; however, this has declined in recent years (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 Carnegie Units over and beyond MSMS graduation requirements.** Other options will be considered only in exceptional 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 Success 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 Success Committee is comprised of administrators, counselors, staff, and faculty who want to attend the meetings. The Academic/Behavioral Review Committee meets every quarter to determine the status of students who have been identified with academic and/or behavioral issues. The Academic/Behavioral Review Committee consists of the same individuals as the Student Success committee: administrators, counselors, staff, and faculty. The only difference is 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 which 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 for 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 re-enroll 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 Carnegie Units 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 World Language Carnegie Unit from his/her home school who fails the first year of a World Language as a junior cannot take two years of World Language concurrently as a senior to meet the MSMS graduation requirement of two Carnegie units

of World language); **students must successfully complete two years of the same World language to graduate from MSMS;**

- 6) Students failing Algebra II;
- 7) Juniors who fail to earn a Carnegie Unit 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 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 1st 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 credits or award placement for certain **pre-approved** courses taken at a community college or university. **CARNEGIE UNITS 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 Carnegie Units 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

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 2023 and 2024

Students in the Class of 2023 and the Class of 2024 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] 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 of working with MSMS students. We ask that the student follow these guidelines, although we do realize that each student is an individual with special abilities and needs. Please call 662-329-7670 to contact an academic counselor if questions arise during the academic school year.

- Read thoroughly the course descriptions in the Course Catalog, paying particular attention to the necessary prerequisites and amount of Carnegie Units 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 considers 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 will be required to enroll in a sufficient number of required and elective courses so that the total number of Carnegie Units earned at MSMS is at least 13. Only one Carnegie Unit in the Arts may apply toward the 13 MSMS Carnegie Units required for graduation. No correspondence

course or virtual school credits may be used to meet the requirement of 13 MSMS Carnegie Units.

- **Health** -- Students must have credit (1/2 Carnegie Unit) for Health by July 15 prior to their junior year.

MSMS GRADUATION REQUIREMENTS CLASSES OF 2022 & 2023

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

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

Mathematics – Each student is required to earn **two CUs** in mathematics, to include at minimum 1/2 CU in Calculus and 1/2 CU in Statistics.

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

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

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

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

Health -- Students must have received credit (1/2 Carnegie Unit) for Health before the first day of classes junior year

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

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

Technology and Computer Science – 1 CU if not previously completed at your home school.

All students must have earned a Carnegie Unit in Algebra I and Unified Geometry before entering MSMS. It is strongly recommended that Algebra II be completed also. If a student has completed Algebra I and Algebra II, but does not have a CU for Unified Geometry, the student may be granted provisional admission and must complete a Geometry course through an accredited program, which is approved in advance by the Director for Academic Affairs. **This CU 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 CUs at MSMS.

MSMS Graduation Requirements Classes of 2022 and 2023

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 or CCSS Algebra I or CCSS Integrated Math I (1 Carnegie Unit) Algebra II or CCSS Algebra II or Integrated Math III (1 Carnegie Unit) Unified Geometry or CCSS Geometry or CCSS Integrated Math II (1 Carnegie Unit) Trigonometry (1/2 Carnegie Unit) Foundations of Higher Math or its equivalent or CCSS Advanced Math (1/2 Carnegie Unit) Calculus or AP Calculus AB or AP Calculus BC (1/2 Carnegie Unit) or AP Statistics (1/2 Carnegie Unit)
SCIENCE	4	Biology I (1 Carnegie Unit) MSMS Biology (1 Carnegie Unit) MSMS Chemistry (1 Carnegie Unit) MSMS Physics (1 Carnegie Unit)
SOCIAL SCIENCES	4	U.S. History (1 Carnegie Unit) U.S. Government (1/2 Carnegie Unit) Mississippi Studies (1/2 Carnegie Unit)* World History (1 Carnegie Unit) Economics (1/2 Carnegie Unit) Geography (1/2 Carnegie Unit)
TECHNOLOGY and COMPUTER SCIENCE	1	Computer Applications (1/2 Carnegie Unit) and Keyboarding (1/2 Carnegie Unit) or Cyber Foundations 2 in the 8 th grade (1 Carnegie Unit)**
HEALTH	½	Comprehensive Health or Family and Individual Health (prior to first day of Junior year)
PHYSICAL EDUCATION	½	Class of 2023 and 2024****
THE ARTS	1	Examples: Band, Choral Music, Drama, Drawing, Painting, Sculpture***
WORLD LANGUAGE	2	Two units of the same World Language required
College and Career Readiness	1	¼ Carnegie Unit will be completed each semester
Swing Credit	½	Either a MSMS Mathematics, Science, Computer Science or Engineering Course
OTHER ELECTIVES	1	Your Choice
TOTAL UNITS REQUIRED	24 ½	

* CU 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 Carnegie Unit in the Arts may be applied toward the 13 required MSMS Carnegie Units

****Students who have received Carnegie Unit 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 Carnegie Units to 7 ½. The minimum requirement is 7 Carnegie Units 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 Carnegie Units.**

When the 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.

College and Career Readiness (CCR) merged with MSMS 101 and is a required course for juniors. The purpose of CCR/MSMS 101 is as follows:

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 help students navigate the college search and application process. Students will receive information on the latest scholarships available.
3. Learn skills to assist in the living learning community that is MSMS. These skills include communication, hygiene, personal safety, suicide prevention awareness, etc.
4. To meet the objectives of the College and Career Readiness Course as set by the MDE graduation requirement

Students will earn 1 Carnegie Unit at the completion of the CCR standards. This course does count towards the MSMS 13.

Seniors

A minimum of 6 academic Carnegie Units 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:

CU: Carnegie Unit

Course: Class

Pre-requisite: A course that must have been taken with CU 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 **Friday, June 3rd, 2022**, before 3:30 pm to submit a written request for a change in course selections for the next school year. After June 3, 2022, 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 to 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) Carnegie Units 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

This catalog lists all 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. **Enough 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 bluebirds 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 digital 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 2
CU: $\frac{1}{2}$
Length: 1 semester

CS 703 - Introduction to Programming (College Credit from MSU)

This course introduces 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 solve problems. 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: Algebra2
CU: 1
Length: 1 semester

CS 704 – Intermediate Programming (College Credit from MSU)

This course explores object-oriented problem solving, design, and programming, transitioning the student from Python to C++. It also introduces 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
CU: 1
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
CU: $\frac{1}{2}$
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 and the logic necessary to make robots interact with their environment. This class will focus on structures as well as programming.

Prerequisite: None
CU: $\frac{1}{2}$
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
CU: $\frac{1}{2}$
Length: 1 semester

SC 719- 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
CU: $\frac{1}{2}$ (elective credit)
Length: 1 semester

CS 711 - Introduction to Artificial Intelligence

This class will give students the opportunity to learn about four forms of artificial intelligence. The class will be broken up into four units. Each unit will focus on a new strategy to create artificial intelligence to solve a problem. Each unit will end with students applying the recently learned AI strategy to solve a new problem.

Prerequisite: Introduction to Programming
CU: 1/2
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
CU: ½ or 1 (elective credit)
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 with hands-on, real- world learning experiences through the Engineering Lab that will help them learn problem solving skills.

SC 210 –Introduction to Engineering (College Credit from MSU)

This course introduces students to engineering. Students will learn the engineering design process, engineering concepts, and the different engineering majors and their applications. Through this course, students will be asked to conduct hands-on activities that will teach them the basics of engineering and will meet and discuss with professional engineers. This course will allow students to better understand engineering and its applications for their future careers.

Prerequisite: None
CU: 1
Length: 1 semester

SC 212 – Engineering Design/Special Topics in Engineering

Students will choose an engineering problem that they would like to solve. Through the first half of the class, they will research the problem they are attempting to solve as well as gather the skills necessary to design their solution. The second half of the class will be spent testing their designs and communicating their results. This course acts as a capstone course for students interested in pursuing Engineering.

Prerequisite: Intro to Engineering (seniors only), or consent of instructor
CU: $\frac{1}{2}$
Length: 1 Year

SC 214 – Mechanics of Materials

Students enrolled in this course will learn about materials science and how it is an integration of engineering, organic chemistry, and physics. They will learn about the distinct types of materials, their properties, and how engineers choose materials for different projects. A substantial portion of this course will be hands-on.

Prerequisite: Intro to Engineering, Mechanics
CU: $\frac{1}{2}$
Length: 1 Semester

SC 345 – Electronics

This course is offered to allow students an opportunity to develop expertise in electronics. Assignments will be made from both text and laboratory designs. Students can gain familiarity with basic DC and AC circuits, measuring voltage/current/resistance, measuring AC signals, assessing complex impedance, designing simple antennas, and other introductory electrical engineering practices. A major part of the grade will be a final project.

Pre or Co-requisite: Calculus 1 or equivalent
CU: $\frac{1}{2}$
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, Debate, 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 graduation requirement. Seniors are required to enroll in **one of the following** to satisfy the graduation requirement: EN 102 (University Composition), EN 103 (University American Literature), EN 200 (University English Literature), or the combination of EN 216 (World Literature) and EN 235 (Southern Writers). Seniors can earn elective credit for courses other than EN 102, EN 103, or EN 200. 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 104 – University Composition I (MUW College Credit)

Students who take University Composition I must have an English score of 21 on the ACT or department approval. 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 3 semester hours of college credit: three hours for MUW-EN 101(English Composition I). This semester course explores writing across multiple modes and encourages the development of analytical skills, as students will author essays based on readings, observations, interviews, and memories.

Prerequisites: Junior standing, admission to MUW, and an English ACT score of 21 or department approval
CU: 1
Length: 1 Semester

EN 105 – University Composition II (MUW College Credit)

Students who take University Composition II must have completed University Composition 1. This course is offered for dual credit. By an articulation agreement with the Mississippi University for Women, students who successfully complete the class will receive 3 hours for MUW-EN 102 (English Composition II). The semester course builds on skills from the previous semester. Students will also practice research methods and source integration, culminating in the junior research paper. One section of this course, the Real Mississippi Podcast section, requires students to turn their research into podcasts that will be disseminated on various social media platforms. These students will also participate in the National Public Radio podcast challenge.

Prerequisites: Junior standing & University Composition I
CU: 1
Length: 1 Semester

EN 106 – University American Literature I (MUW College Credit)

Students who take University American Lit I must have a reading score of 25 on the ACT or department approval. This course is offered for dual credit; students who successfully complete the class will satisfy the requirement for junior or senior English at MSMS and receive 3 semester hours of college credit for MUW-EN 203 (Survey of American Literature I). The course is a survey of American literature from the colonial period to the mid 19th century. It also has a writing component that includes narrative, descriptive, expository, and critical essays.

Prerequisites: Admission to MUW, and a reading Act score of 25
or department approval
CU: 1
Length: 1 Semester

EN 107 – University American Literature II (MUW College Credit)

Students who take University American Literature II must have completed University American Literature I. This course is offered for dual credit for 3 semester hours of college credit for MUW-EN 204 (Survey of American Literature II). The course is a survey of American literature from the mid 19th century to the present. It also has a writing component that includes narrative, descriptive, expository, and critical essays, and a research paper.

Prerequisites: University American Literature I
CU: 1
Length: 1 Semester

EN 122 – Late American Drama (Even)

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
CU: 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
CU: 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
CU: ½
Length: 1 semester

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.

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

EN 202 – University English Literature I (MUW College Credit)

Students who take University English Literature must have a 25 Reading score on the ACT or department approval. 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. The course is a study in chronological order of selected works representative of different periods of English literature from *Beowulf* through the mod-18th century. 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/or a research paper.

Prerequisites: Senior standing, admission to MUW, Reading ACT score

CU: 1
Length: 1 semester
of 25 **or** department approval

EN 203 – University English Literature II (MUW College Credit)

Students who take University English Literature II must have completed University English Literature I or Reading ACT score of 25 **or** department approval. 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 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 mid 18th century 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/or a research paper.

Prerequisites: Senior standing, admission to MUW, Reading ACT score
of 25 **or** department approval
CU: 1
Length: 1 semester

EN 216 – World Literature

World Literature explores in translation the major writers from Europe, the Americas, Africa, the subcontinent of India, China, and Japan, and from a variety of historical periods and literary movements. Readings will include the major genres of literature: poetry, short story, novel, drama, and essay. The course will be reading- and discussion-based, but students will also write literary analysis essays (including the senior research paper) and make presentations to the class. This course, when paired with Southern Writers, satisfies the MSMS requirement for senior English CU.

Prerequisite: Senior standing
CU: 1/2
Length: 1 semester

EN 235 – Southern Writers

Students in this one semester course will explore the place of the American South in the literary world by reading short stories, memoirs, poetry, novels, and plays from the Antebellum period to the present, with special attention paid to the historical contexts in which the works arise. Students will also interrogate definitions of Southernness in works of criticism, placing themselves in academic conversation with scholars of Southern arts and culture. The course will be reading and discussion-based, but students will also write literary analysis essays and make presentations to the class. Students will also be expected to attend the Eudora Welty Writers' Symposium at MUW in the fall semester. This course, when paired with World Literature, satisfies the MSMS requirement for senior English CU.

Prerequisite: Senior Standing
CU: 1/2
Length: 1 semester

English Electives Only:

EN 152 – Journalism I

In Journalism I, students both produce the school newspaper (*The Vision*) 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 writing news, features, sports, reviews, and opinions; using the digital camera or video camera; and retouching pictures using Photoshop and laying out a print issue in InDesign.

Prerequisite: Non
e CU: ½
Length: 1 year

EN 155 – Journalism II

In Journalism II, students will continue their study of journalism. Issues of leadership such as editorship are the focus of this curriculum. Students will learn and use the SNO's WordPress software to lay out the newspaper; manage files and articles from Journalism I students; conduct editorial board meetings; make decisions about the content and format of *The Vision*, the school newspaper; edit articles and evaluate them for inclusion in the paper; and learn about web site and social media management.

Prerequisite: Non
e CU: ½
Length: 1 year

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 last for ninety minutes each week for the entire year. Juniors or Seniors may enroll in this course.

Prerequisite: None
CU: 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 last for ninety minutes each week for the entire year. Juniors or seniors may enroll in this course if they have earned CU in Creative Writing I.

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

EN 255, EN256 Speech and Debate I and II

The course will introduce and expand the student's ability to give presentations and argue for and against

positions. The student will give many presentations throughout the year, both in the classroom and at competitive events. The student will learn how to organize a speech, adjust to the audience, research evidence, respond to critique, and how to be persuasive and memorable.

Prerequisite: None
CU: ½(elective)
Length: 1 year

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
CU: ½ (elective)
Length: 1 semester

FINE AND PERFORMING ARTS

Introduction

The department of Fine and Performing Arts exists to provide 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 CU** of fine arts during grades 9-12. Courses such as chorus, band or art taken during the 9th and/or 10th 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 CU of fine arts taken at MSMS may be applied toward the required 13 MSMS CUs.

Objectives

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

- 1) To recognize distinctive 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 using 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

This course is an introduction to drawing. The course is designed to focus on developing observational skills and drawing techniques. Students will employ a wide range of drawing media and subject matter.

Prerequisite: None
CU: $\frac{1}{2}$
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 at an advanced level of training. The course will introduce students to color mediums.

Prerequisite: Drawing I
CU: $\frac{1}{2}$
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
CU: $\frac{1}{2}$
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 acrylic paint. Students will begin to analyze their own unique styles. The final project will be tailored to the student's strengths and preferences as a new artist.

Prerequisite: Painting I
CU: $\frac{1}{2}$
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
CU: $\frac{1}{2}$
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 creatively.

Prerequisite: Sculpture I
CU: $\frac{1}{2}$
Length: 1 semester

FA 710 - Photography I

Photography I is a studio course that will be an introduction to the techniques, fundamentals, and aesthetics of color digital photography. Students will become familiar with the characteristics of the digital camera and lens, metering, and exposure techniques; digital image capture/editing in Photoshop CS Cloud and Adobe Camera Raw; as well as production of quality imagery via the inkjet printing process. Students will explore various subject matter and conceptual themes with a goal of displaying work that demonstrates proper camera operation.

Prerequisite: None
CU: $\frac{1}{2}$
Length: 1 semester

FA 711- Photography II

Photography II is a studio course built upon the foundation of photographic seeing and the advanced uses of digital techniques. The primary focus of this course is the development of a personal photographic vision through the utilization of photographic aesthetics and employment of an improved sense of technical craft.

Prerequisite: None
CU: $\frac{1}{2}$
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 coursework
CU: $\frac{1}{2}$
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
CU: $\frac{1}{2}$
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
CU: 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 to allow students to experience the creative process that is necessary to perform in a truly collective art.

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

FA 511 – Choral Performance

This course is for vocalists from school, civic or community choral programs. **Contact the instructor if you wish to take the class and have no previous experience.* Students 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
CU: ½ (may be repeated for a total of 1 CU)
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
CU: 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
CU: ½
Length: 1 semester (Fall Only)

FA 514 – Beginning Band 2

Beginning Band 2 is a continuation of Beginning Band.

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

FA 516 – Guitar Studies

This course is for beginning guitar students and experienced guitarists including bass guitar. 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
CU: 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 assorted 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 CU and will count towards the required MSMS 13 CUs.

Prerequisite: None

CU: 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
CU: ½ (elective CU beyond the required 13.0)
Length: 1 semester

WORLD LANGUAGE

Introduction

All MSMS graduates must have successfully completed two years of high school World language study, with both CUs 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. World 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 World 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 World Language Required Courses

Students who have never earned CU in a World language course before entering MSMS **must earn 2 World language CUs during their junior and senior years.**

Most out-of-state universities require that the two CUs of World 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 World languages, the student will be equipped:

- 1) To understand and speak, at a beginning level, at least one World 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
CU: 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 essential elements learned in French I, while introducing additional verb tenses and pronoun groups.

Prerequisite: French I
CU: 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
CU: 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
CU: 1
Length: 1 year

Additional years of a World 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 CUs. Students will work with their academic counselor to ensure these courses are offered and will fit into the existing student schedule. The 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 discussions of Roman culture and mythology, including individual projects where students are free to explore topics of interest.

Prerequisite: None
CU: 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
CU: 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
CU: 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 essential 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
CU: 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
CU: 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 essential 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
CU: 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
CU: 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
CU: ½(elective)
Length: 1 semester

CS719- 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
CU: ½ (elective CU)
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 departmental approval for accelerated study (approval for accelerated study will be based on home school course work, pre-test score, and ACT Math score.); one semester of calculus (0.5); and one semester of statistics (0.5). Students must complete a minimum of 2.0 CUs in mathematics and must be enrolled in one mathematics course each semester. The calculus sequence (Foundations, 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 have completed 3.0 CUs of approved mathematics courses with an A average while attending MSMS shall qualify. The Mathematics Department and the Director for Academic Affairs will 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 courses
- AP Calculus II or higher
- AP Statistics II
- 1.0 additional Carnegie Unit in mathematics, which may be satisfied by any combination of AP Calculus III (0.5), Differential Equations (0.5), Math Modeling (0.5), Discrete Mathematics (0.5), Intro to Programming (0.5), or Linear Algebra (0.5). Other course work must have departmental approval.

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

Objectives

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 to enhance the implementation of the department's curricular goals.

All students must have earned CUs of Algebra I and Geometry, or Integrated Math I and II, before entering MSMS. If a student does not have a CU for Geometry, the student must take a Geometry course either by correspondence, virtual school, or summer school offerings. This CU 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

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

Prerequisites: Algebra I and Geometry, or equivalent
CU: 1
Length: 1 semester

MA 232 – Advanced Math Plus: Foundations for Higher Mathematics

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 student investigates models, performs experiments, and analyzes data. This course includes a lab.

Prerequisites: Geometry and Algebra II, or equivalent
CU: $\frac{1}{2}$
Length: 1 semester

MA 221 – Advanced Math Plus: Trigonometry

This course provides a comprehensive study of trigonometric functions with an emphasis on applications. Topics will include circular functions and their graphs, triangle trigonometry, identities and equations, and vectors.

Prerequisites: Foundations or departmental approval
CU: $\frac{1}{2}$
Length: 1 semester

CALCULUS

MA 241 – AP Calculus I

This course provides a thorough treatment of differential calculus, including limits, continuity, derivatives, and applications of derivatives. This course follows an AP Calculus AB and BC syllabus.

Prerequisites: Trigonometry or departmental approval
CU: $\frac{1}{2}$
Length: 1 semester

MA 244 – University Calculus I

This course provides a thorough treatment of differential calculus, including limits, continuity, derivatives, and applications of derivatives. University credit will be given through the Mississippi University for Women.

Prerequisites: Trigonometry or departmental approval
CU: 1
Length: 1 semester

MA 251 – AP Calculus II

This course provides 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 Calculus AB and BC syllabus. Completion of this course prepares students to take the AP Calculus AB Exam.

Prerequisites: Grade of B or better in AP Calculus I
CU: $\frac{1}{2}$
Length: 1 semester

MA 248 – University Calculus II

This course provides 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: Grade of B or better in University Calculus I
CU: 1
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 thorough coverage of infinite series, including Taylor Series. This course follows an AP Calculus BC syllabus. Completion of this course prepares students to take the AP Calculus BC Exam.

Prerequisites: Grade of B or better in AP Calculus II
CU: $\frac{1}{2}$
Length: 1 semester

MA 257 – AP Calculus BC

This course provides a thorough treatment of differential and integral calculus, including limits, continuity, derivatives, applications of derivatives, Riemann sums, applications of integrals, and techniques of integration, as well as the calculus of transcendental functions. In addition, 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 thorough coverage of infinite series, including Taylor Series. This course is intended to prepare students who demonstrate high proficiency in Foundations and Trigonometry to take the AP Calculus BC exam.

Prerequisites: Grade of A in both Foundations and Trigonometry and departmental approval
CU: 1
Length: 2 semesters

MA 249 - Multivariable Calculus (Fall Only)

This course extends the techniques of calculus to functions of several variables. Major topics include limits, continuity, partial differentiation, multiple integration, and vector calculus.

Prerequisites: AP Calculus III or AP Calculus BC
CU: $\frac{1}{2}$
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- and second-order differential equations, as well as systems of differential equations.

Prerequisites: AP Calculus II or AP Calculus BC or instructor approval
CU: $\frac{1}{2}$
Length: 1 semester

STATISTICS

MA 270 – AP Statistics I

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. This course is designed as preparation for the AP Statistics Exam and is meant to precede AP Statistics II. *Note: Both AP Statistics I and AP Statistics II are required to receive AP credit.*

Prerequisites: Senior standing or instructor approval
CU: $\frac{1}{2}$
Length: 1 semester

MA 272 – AP Statistics II

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.

Prerequisites: AP Statistics I
CU: $\frac{1}{2}$
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. This course is recommended for students interested in applied math or engineering. This class also serves as an introduction to some of the numerical techniques used in math, science, and engineering. Topics will be chosen by the instructor, but may include error analysis, root-finding algorithms, interpolation, numerical integration, Monte Carlo methods, and data analysis. These techniques will be applied throughout the course to various real-world models. Numerical and visualization software such as EXCEL will be used extensively.

Prerequisites: Foundations or its equivalent,-and/or math department approval
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.

Prerequisites: Trigonometry
CU: $\frac{1}{2}$
Length: 1 semester

MA 280 – Discrete Mathematics (Spring only)

Discrete Mathematics serves as an introduction to the mathematical foundations of advanced mathematics, with a focus on logic, set theory, relations, functions, and proof techniques. Students will be exposed to formal proof writing, as well as the language and methods used by mathematicians. Applications will be selected by the instructor, but may include concepts from geometry, number theory, graph theory, combinatorics, coding theory, topology, abstract algebra, and theoretical computer science. This class will include a lot of mathematical writing and is highly recommended for students interested in pursuing mathematics in college.

Prerequisites: Calculus I or instructor approval
CU: $\frac{1}{2}$
Length: 1 semester

MA 266 – Linear Algebra (Spring Only)

This course is a study of systems of linear equations, matrices, 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.

Prerequisites: AP Calculus II or AP Calculus BC
CU: $\frac{1}{2}$
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. This course can count toward the MSMS 13 requirement for students who have completed the majority of the MSMS mathematics curriculum and received department permission. This course may also be used for Math and Science Outreach involvement.

Prerequisites: instructor approval and permission from the Director for Academic Affairs

CU: $\frac{1}{2}$ (elective CU 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 proficiency in 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 interests through elective courses and independent research.

Guidelines for Required Science Courses

In general, students complete two CUs of science during the junior year and the third CU of science and one-half swing CU 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 CUs in science by successfully completing one CU 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, University General Biology, or AP® Biology which are prerequisites for all other biology courses. Students coming to MSMS having scored a 4 or 5 on the AP Biology exam must still complete one full year of Biology, but do not have to take the prerequisite courses above.
- (2) Chemistry – Students who have not completed a year of chemistry at their home school should enroll in SC369 Advanced Chemistry I (fall) and SC370 Advanced Chemistry II (spring). Students who have completed a year of chemistry at their home school may enroll in either SC358 University General Chemistry I (fall) and SC359 University General Chemistry II (spring) OR SC355 AP® Chemistry, depending on ACT score and placement tests. Students who completed AP® Chemistry prior to MSMS and earned a passing score (≥ 3) on the AP® Chemistry examination should plan to enroll in SC357 Organic Chemistry and SC364 Analytical Chemistry during their senior year. Students who completed AP® Chemistry prior to MSMS and earned a score of ≤ 2 on the AP exam should enroll in SC358 University General Chemistry I (fall) and SC359 University General Chemistry II (spring).
- (3) Physics - All students must successfully complete SC331 Mechanics and SC332 Waves and Electricity or SC 337 AP Physics-C Mechanics and SC 338 AP Physics C E&M before graduation. Students who wish to experience the most rigorous first-year physics program offered at MSMS should enroll in AP-C Mechanics (SC337) in the first semester of physics studies and AP-C E&M concurrently with Fluids, Thermo and Optics in the second semester (SC 338 and SC 434).

Objectives

- 1) To prepare the student for success in college, specifically in the sciences.
- 2) To encourage the student in the application of scientific principles to problem solving and to train the student in critical thinking skills employing scientific standards of evidence. .
- 3) To prepare the student to read and comprehend scientific literature.
- 4) To encourage a life of scientific literacy and prepare the student to make intelligent civic choices concerning scientific issues.

BIOLOGY COURSES

Requirements for Graduation: All students are required to successfully complete one full year of biology for 1 full Carnegie Unit (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. 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. 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** or **University General Biology I and II**
- 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), **Introduction to Epidemiology** (0.5 CU), **Genetics** (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 studying every hour in lecture. This is typically a course for juniors. Seniors would need the permission of a faculty member to enroll.

Prerequisite: One year of Biology, appropriate score on the biology placement test, or
ACT score of 25 or higher
CU: 1 (biology)
Length: 1 year

SC 312 – Cell Biology

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

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

SC 326 - University General Biology I and Lab

University General Biology I explores fundamentals of biochemistry, cell biology, genetics, and evolution. Concepts include important organic molecules, cell structure and function, metabolism and enzyme activity, cellular respiration and photosynthesis, DNA structure, meiosis and mitosis, Mendelian genetics, and molecular evolution. Text: Biology, Campbell and Reece, Chapters 1-25.

Prerequisite: ACT Score > 22 or department approval
CU: 1 (biology)
Length: One Semester course

SC 327 - University General Biology II and Lab

University General Biology II covers fundamentals of biodiversity, the structure and function of organisms, and ecology. Concepts include molecular phylogeny, diversity of life, principles of plant and animal forms and reproduction, and ecological relationships at the population, ecosystem, and global levels Text: Biology, Campbell and Reece, Chapters 26-56.

Prerequisite: University Biology I
CU: 1 (biology)
Length: One Semester course

SC 313 – Microbiology

Microbiology covers the fundamentals of the microscopic world, including viruses, bacteria, and parasites. 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, first semester of AP® Biology or U Gen Bio, or score of 4 or better on AP Exam
CU: ½ (biology)
Length: 1 semester

SC 315 - Plant Physiology

Plant physiology surveys various physiological processes in plants (primarily angiosperms). Topics include photosynthesis, plant metabolism, plant cell/water relationships, regulation of plant growth, and reproductive strategies.

Prerequisite: Cell Biology, first semester of AP® Biology or U Gen Bio, or score of 4 or better on AP Exam
CU: ½ (biology)
Length: 1 semester

SC 316 - Animal Physiology

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

Prerequisite: Cell Biology, first semester of AP® Biology or U Gen Bio, **or** score of 4 or better on AP Exam
CU: ½ (biology)
Length: 1 semester

SC 318 – Genetics

Genetics covers 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.

Prerequisite: Cell Biology, first semester of AP® Biology or U Gen Bio, **or** score of 4 or better on AP Exam
CU: 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. Starting in Spring 2023, this course will be taught in conjunction with faculty at MSU. Focus will be placed on using *Mathematica* for the purpose of developing and evaluating mathematical models of key ecological and evolutionary processes.

Prerequisite: Cell Biology, first semester of AP® Biology or U Gen Bio, **or** score of 4 or better on AP Exam
CU: ½ (biology)
Length: 1 semester

SC 323 Introduction to Epidemiology (Seniors)

This course introduces 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.

Prerequisite: Cell Biology, 1st Semester of AP Biology, or University General Biology I, **or** score of 4 or better on AP Exam
CU: ½ (biology)
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.

Prerequisite: SC 357 and department approval
CU: 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
CU: ½ (elective CU beyond the 13.0 required)
Length: 1 semester (with the option to repeat the course for another ½ CU)

CHEMISTRY COURSES

Requirements for Graduation: All students are required to successfully complete one full year of chemistry for 1 Carnegie Unit (two semesters) at MSMS. Students will complete either the two-semester sequence of Advanced Chemistry I ($\frac{1}{2}$ CU) and Advanced Chemistry II ($\frac{1}{2}$ CU) or AP[®] Chemistry (1 CU) to fulfill the requirement. For students completing AP Chemistry and earning a passing score (≥ 3) on the AP Chemistry exam prior to MSMS, successful completion of Organic Chemistry ($\frac{1}{2}$ CU) and Analytical Chemistry ($\frac{1}{2}$ CU) during the senior year will satisfy the 1 CU graduation requirement. For students completing AP Chemistry and earning a score ≤ 2 , successful completion of SC358 University General Chemistry I (fall) will satisfy the 1 CU graduation 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[®] Chemistry or Dual Credit 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).

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 369 – Advanced Chemistry I

Advanced Chemistry I 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
CU: $\frac{1}{2}$ (chemistry)
Length: 1 semester

SC 370 – Advanced Chemistry II (Spring only)

Advanced Chemistry II studies the types of and laws governing the reactions of matter. 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.

Prerequisite: Adv Chemistry 1
CU: $\frac{1}{2}$ (chemistry)
Length: 1 semester

SC 355 – AP® Chemistry

This course provides an in-depth study of the principles of modern chemistry and should prepare the student for the AP® 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; Algebra II; appropriate score on the chemistry placement test or an ACT score of 25 or higher.
CU: 1 (chemistry)
Length: 2 semesters

SC 358 - University General Chemistry I and Lab

This course is designed to lay the groundwork for future study in chemistry by familiarizing the student with fundamentals of chemistry including naming of chemical species, stoichiometry, and atomic structure in addition to problem-solving. The lab experience will reinforce topics covered in class.

Prerequisite: ACT Score > 22 or department approval; enrollment in MA 221 or higher
CU: 1 (chemistry)
Length: One Semester course

SC 359- University General Chemistry II and Lab

This course is a continuation of SC 358. The course continues the exploration of chemistry fundamentals with kinetics, equilibrium, and acid-base chemistry among other topics. The lab experience will reinforce topics covered in class.

Prerequisite: SC358
CU: 1 (chemistry)
Length: One Semester course

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 369/370 or SC 355 or SC358/359; and department approval
CU: 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.

Prerequisite: SC 357 and department approval
CU: 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.

Prerequisite: SC 369/370 or SC 355 or SC358/359; and department approval

CU: 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.

Prerequisite: SC 369/370 or SC 355 or SC358/359; and department approval

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

Length: 1 semester

SC 325 – Special Topics in Chemistry

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

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

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

PHYSICS COURSES

Requirements for Graduation: All students are required to complete successfully one of the two combinations for 1 full Carnegie Unit:

- SC331 Mechanics and SC332 Waves and Electricity
OR
- SC337 AP Physics-C Mechanics and SC 338 AP Physics C E&M

Students who wish to experience the most rigorous first year physics program offered at MSMS should enroll in AP-C Mechanics (SC337) in the first semester of their physics studies and AP-C E&M concurrently with Fluids, Thermo and Optics in the second semester (SC338 with SC 434).

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. A 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 2.5 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. A 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 SC337 **AP Physics-C Mechanics** and SC 338 **AP Physics-C E&M**
- 0.5 Carnegie Unit SC 434 **Fluids, Thermodynamics and Optics**
- Additional 1.0 CU's (two semesters) which may include **Modern Physics** (SC339), **Electronics** (SC345), **Adv. Problems in Calc-based Physics** (SC333) or **Special Topics in Physics** (SC346).

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

SC 331 – Mechanics

Mechanics is an algebra and trigonometry-based course which provides a college level introduction to the principles of Newtonian mechanics. Successful completion of this course will provide the student with a solid foundation in the topics of kinematics, work, energy, momentum, and power. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences and an emphasis on conceptual understanding.

Prerequisite/ CU:	Completion of Algebra 2 with a B or higher $\frac{1}{2}$
Length:	1 semester

SC 332 – Waves and Electricity

Waves and Electricity is an algebra and trigonometry-based course which provides a college level introduction to rotation, vibration and wave motion, sound, and an introduction to the principles of classical electricity and DC circuits. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences.

Prerequisite: Mechanics
CU: $\frac{1}{2}$
Length: 1 semester

SC 434 – Fluids, Thermodynamics, & Optics

This algebra and trigonometry-based course provides the student with an introduction to fluid mechanics, thermodynamic principles, geometrical optics, and simple optical instruments. 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, light reflection, and refraction in optical instruments. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences. NOTE: This course may be taken concurrently with Waves & Electricity or AP-C E&M (or after completing them).

Prerequisite/Corequisite: Waves & Electricity or AP-C E&M
CU: $\frac{1}{2}$
Length: 1 semester

SC 339 – Modern Physics

This algebra and trigonometry-based course provides the student with a solid foundation in the topics of special relativity, electromagnetic waves, physical optics and radiometry, introductory atomic theory, radioactivity, and nuclear physics.

Prerequisite: Waves & Electricity or AP-C E&M
CU: $\frac{1}{2}$
Length: 1 semester

SC 337 - AP[®] Physics C: Mechanics (Fall Only)

The course provides students with a calculus-based introduction to the principles of classical mechanics. Topics include kinematics, Newton's Laws, collisions and conservation laws, work and energy, rotational motion, statics, harmonic motion, universal gravitation, and other topics as well. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences.

Prerequisite: Trigonometry or equivalent
Prerequisite/Corequisite: Calculus I or equivalent
CU: $\frac{1}{2}$
Length: 1 semester

SC 338 - AP® Physics C: Electricity and Magnetism (Spring Only)

The course provides students with a 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, leading to Maxwell's Equations. Critical thinking and reasoning skills are developed through inquiry-based laboratory experiences.

Prerequisite: AP® Physics C; Mechanics

Pre or Corequisite: Calculus 2

CU: $\frac{1}{2}$

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 basic DC and AC circuits, measuring voltage/current/resistance, measuring AC signals, assessing complex impedance, designing simple antennas, and other introductory electrical engineering practices. A major part of the grade will be a final project.

Prerequisite/Corequisite: Calculus 1 or equivalent

CU: $\frac{1}{2}$

Length: 1 semester

SC 346 – Special Topics in Physics

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

Prerequisite: Consent of instructor and Academic Director

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

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

SOCIAL SCIENCE

Introduction

The capacity to reason reflectively and constructively concerning the problems individual and society 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 problem solving of social concerns.

Requirements for Graduation: U.S. History is required of all students during their junior year unless they earned this Carnegie Unit in grades 9 or 10. Students who have not earned a full Carnegie Unit 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 CU is enrolled in U.S. History junior year, it is recommended they take World History senior year. Additionally, students must earn a ½ Carnegie Unit 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 explore the broad sweep of both ancient and contemporary ideas that have shaped our world;
- 2) To analyze the fundamentals of how our economic system works and how our political system functions;
- 3) To grasp the nuance between societies ranging from free to repressive;
- 4) To demonstrate this understanding through informed and committed exercise of citizenship.
- 5) To conduct research through primary source analysis and synthesize information into an original product.

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
CU: 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
CU: 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
CU: 1 (meets US History 1877-Present graduation requirement)
Length: 1 Year

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

University United States History II offers qualifying students an opportunity to receive dual CU 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, Composite ACT Score of 20 **OR** permission of Director for Academic Affairs
CU: 1 (**meets US History 1877-Present graduation requirement**); 3 MUW
CUs Length: 1 semester

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 event materials and research projects. **This course does not fulfill the Mississippi State Department of Education U.S. History graduation requirement.**

Prerequisite: None
CU: 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 CU Geography graduation requirement.**

Prerequisite: None
CU: ½
Length: 1 semester

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

This course will examine the sources and themes of 20th 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
CU: 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
CU: 1 (meets World History graduation requirement)
Length: 1 year

SS 626 –University History of Western Civilization (College CU)

History of Civilization offers qualifying students an opportunity to receive dual CU 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, Composite ACT Score of 20 **OR** permission of Director for Academic Affairs
CU: 1 (meets World History graduation requirement); 3 MUW CUs
Length: 1 semester

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 be built 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. This culminates in each student creating their own original business plan by the end of the course.

Prerequisite: None
CU: 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
CU: 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
CU: ½ (elective CU)
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, the 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 period of 1918 to 1950, with an emphasis on the years 1939-1945.

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

SS 609 - History of Science

Course Description: Throughout history, humans have struggled to understand the physical world around them. This course will examine their efforts to do so, beginning in ancient times and concluding in the twenty-first century. It will provide students with an overview of how major scientific and technological advancements emerged and the cultural context that allowed for their emergence. In other words, it will explore the interplay between major scientific developments and the cultural, social, political, and economic factors surrounding them.

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

SPECIAL STUDY OPTIONS

Guidelines for 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 a 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 three hours per week with a mentor and complete various assignments related to their placement. **Up to 1.5 Carnegie Units of mentorship can be earned at MSMS. However, only the 2nd ½ Carnegie Unit will count toward the 13 MSMS required courses.** Course may be repeated.

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

ID 196– Introduction to Scientific Methods I and II

If you want to compete in science fair- take this course! This course will provide an opportunity for participants to establish or advance their understanding of research through critical exploration of research language, ethics, and various research methods. The course introduces the language of research, ethical principles and challenges, and the elements of the research process within quantitative, qualitative, and mixed methods approaches. Participants will use these theoretical underpinnings to begin to critically review literature relevant to their field or interests and design, implement and defend their research in a Spring regional competition. **Students will meet once a week for an entire year.**

Prerequisite: None
CU: ½
Length: 1 year

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
CU: 1 hour
Length: 2 semesters

