

**ILLINOIS MATHEMATICS AND SCIENCE ACADEMY**  
*A Pioneering Educational Community*

**LEARNING OPPORTUNITIES 2007/2008**

**GRADUATION REQUIREMENTS AND COURSE LOAD**

The graduation requirements of the Illinois Mathematics and Science Academy are in concert with those maintained by the State of Illinois with additional requirements as established by the IMSA Board of Trustees. Each semester students must take a minimum of 2.5 credits and a maximum of 3.5 credits. One-semester classes generally receive .5 credits and two semester classes (e.g., World Languages) generally receive 1.0 credit. Most students will take between 5 and 7 academic classes per semester. Fine Arts, Wellness, and Independent Study courses do not count towards the 2.5 credit minimum. However, if a student wishes to take 3.5 credits of academic classes, he/she may choose to enroll in a Fine Arts, Wellness or Independent Study course on a Pass/Fail basis (see below).

**Credit in courses taken at the Academy must total a minimum of 17 units in three years.** The credit distribution is:

- **Eight (8.0) credits in Science and Mathematics**, which include:
  - a) **Minimum four credits (4.0) in Science.**  
The Core Science Program consists of four one semester courses: SCI105, Scientific Inquiries - Chemistry; SCI115, Scientific Inquiries - Physics; SCI125, Scientific Inquiries - Biology; and SCI135, Methods in Scientific Inquiry. **All students are required to complete SCI135, Methods in Scientific Inquiry.** Students new to IMSA who demonstrate an exemplary past academic record in biology, physics, or chemistry may choose to take a placement exam in that particular subject. A satisfactory placement exam score will demonstrate competency in the subject matter of that particular course and the student will then be enrolled in an appropriate elective course. Completion of the Science core program or its equivalent, i.e. satisfactory grades in the appropriate placement exams allows students to enroll in a large number of electives in earth/space science, biology, chemistry, physics, and applied sciences.
  - b) **Minimum three (3.0) credits in Mathematics**, which include core courses that move toward completion of AB or BC Calculus (including Geometry). **Students must be enrolled in at least one core Mathematics course each semester.** (Once the Calculus core sequence is completed, then any approved mathematics elective taken for grade will be considered to satisfy the core course enrollment requirement). All students are mandated to successfully complete the equivalent of a high school geometry course prior to graduation. This requirement can be met in one of the following ways:
    - i) A student completes geometry in own home school, prior to admission to IMSA; or
    - ii) A student completes an IMSA-approved geometry course by the end of junior year.
 Students who have not completed a geometry course prior to admission will automatically be placed into geometry in their sophomore year.
  - c) **One additional (1.0) credit (2 courses) in either Mathematics or Science.**
- **Three (3.0) credits in English**, which include Literary Explorations I and II and two semester electives of senior English. **Students must be enrolled in an English course each semester.**
- **Two and one-half (2.5) credits in Social Science**, which include American Studies (1.0) and Topics in World Studies (1.0) and one Social Science elective.
- **Two (2.0) credits (four semesters) in World Languages** taken two out of the three years at the Academy including completion of an Academy Level II course or higher. All World Languages courses are year long courses and cannot be dropped at the end of the fall semester unless the student receives approval from the instructor and the Principal's Office.
- **One-half (0.50) credit in Fine Arts** taken in music, art, or photography.
- **One (1.0) credit in Wellness** including a one-semester course of Moving and Learning and one elective course (all Wellness courses are P/F only).

All students are also required to:

1. Be enrolled in a minimum of 2.5 credits each semester in which all are taken for a grade.
2. Successfully complete one hundred (100) hours of Academy approved community service by graduation.
3. Successfully complete campus work service.
4. Participate and successfully complete three Intersessions.
5. Participate in Leadership Development programs (i.e. LEAD, Synergy, and Navigation).

Modification of these requirements can be made only with prior approval of the Principal.

Previous high school, virtual high school, or college credits earned at another institution will not earn graduation credit at IMSA.

## MATHEMATICS

**MAT101** (Fall)  
**MAT102** (Spring)

### **Geometry I/II (core)**

Grade Level: Sophomore/Junior/Senior  
Length: One Semester  
Credit: 0.50  
Prerequisite: Initial Placement by Math Department

This is a one semester accelerated course in Euclidean Geometry for students with a solid background in algebra. In addition to content from a standard year long geometry course, problem solving, algebra review, conjecture, and proof are emphasized. Students will also have the opportunity, using computers, to explore geometry dynamically.

**MAT110** (Year Long)

### **Mathematical Investigations I/II (core)**

Grade Level: Sophomore/Junior  
Length: Two Semesters  
Credit: 1.0  
Prerequisite: Initial Placement by Math Department

The Mathematical Investigations courses integrate topics from all areas of pre-calculus mathematics. In these courses, students will be expected to explore mathematical concepts, make conjectures and present logical, valid arguments for mathematical assertions. Both written and oral forms of communication are emphasized. Mathematical Investigations I/II is a two-semester sequence of courses. The first semester emphasizes advanced algebraic skills, linear relationships, equations and applications, data analysis and modeling, and an introduction to functions. The second semester concentrates on the study of matrices, beginning sequences, functions and function transformations, and exponential functions.

**MAT121** (Fall)  
**MAT122** (Spring)

### **Mathematical Investigations II (core)**

Grade Level: Sophomore/Junior/Senior  
Length: One Semester  
Credit: 0.50  
Prerequisite: Initial Placement by Math Department

The Mathematical Investigations courses integrate topics from all areas of pre-calculus mathematics. In these courses, students will be expected to explore mathematical concepts, make conjectures and present logical, valid arguments for mathematical assertions. Both written and oral forms of communication are emphasized. MI-2 focuses on the study of matrices, linear relationships, functions and function transformations, while also introducing exponential functions and combinatorics.

**MAT131** (Fall)  
**MAT132** (Spring)

### **Mathematical Investigations III (core)**

Grade Level: Sophomore/Junior/Senior  
Length: One Semester  
Credit: 0.50  
Prerequisite: Mathematical Investigations II or Initial Placement by Math Department

The Mathematical Investigations courses integrate topics from all areas of pre-calculus mathematics. In these courses, students will be expected to explore mathematical concepts, make conjectures and present logical, valid arguments for mathematical assertions. Both written and oral forms of communication are emphasized. MI-3 builds on MI-2, extending the concept of function and applications to include logarithmic functions, polynomial functions, rational functions, and trigonometric functions.

**MAT141** (Fall)  
**MAT142** (Spring)

**Mathematical Investigations IV** (core)

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Mathematical Investigations III or Initial Placement by Math Department

The Mathematical Investigations courses integrate topics from all areas of pre-calculus mathematics. In these courses, students will be expected to explore mathematical concepts, make conjectures and present logical, valid arguments for mathematical assertions. Both written and oral forms of communication are emphasized. MI-IV focuses on the study of sequences and series, vectors, advanced trigonometry, polar coordinates, complex numbers, and mathematical induction.

**MAT211** (Fall)

**AB Calculus I** (core)

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Mathematical Investigations IV and recommendation of MI Instructors

AB Calculus is a two-semester sequence, which includes the concepts presented in the Advanced Placement AB Calculus syllabus. The first semester course discusses limits, derivatives and their applications.

**MAT222** (Spring)

**AB Calculus II** (core)

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: AB Calculus I

The second semester of this sequence will include additional topics from the Advanced Placement AB Calculus syllabus with a concentration on the integral and its applications. Students completing AB Calculus I and II will have completed the equivalent of a semester of college level calculus.

**MAT311** (Fall)  
**MAT312** (Spring)

**BC Calculus I** (core)

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Mathematical Investigations IV and recommendation of MI Instructors

BC Calculus is a three-semester sequence, which includes the material covered in the Advanced Placement BC Calculus syllabus. This course will cover the foundations of calculus including concepts and applications of rates of change, derivatives, antiderivatives, and limits. With help from technology, these will be seen from graphical, numerical, and analytic points of view.

**MAT321** (Fall)  
**MAT322** (Spring)

**BC Calculus II** (core)

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: BC Calculus I

This second course will continue the study of derivatives and begin work on concepts and applications of integrals. Technology will be an important part of the development of the course.

**MAT331** (Fall)  
**MAT332** (Spring)

**BC Calculus III** (core)

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: BC Calculus II

The third course of the sequence will conclude the material covered in the Advanced Placement BC Calculus syllabus. Topics will include sequences and series, differential equations, and polar graphs.

**MAT402** (Spring)

**Advanced Geometry**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisites: Mathematical Investigations III or recommendation of Instructor

This course is a study of advanced topics in geometry selected from such areas as: points of concurrence, pedal triangles, Miquel points, Wallace lines, non-Euclidean Geometries, the theorems of Ceva, Menelaus, Pascal, Desargues, and Pappus. The course emphasizes mathematical connections through individual and group explorations, discussions and problem solving.

**MAT405** (Fall or Spring)

**Data Analysis**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Mathematical Investigations III or recommendation of Instructor

This is a very hands-on course in elementary statistics. Descriptive statistics and graphical displays for single and bi-variate data will be created and analyzed. Computer software is used for dynamic modeling of data. Students will also analyze ways in which data is used and displayed in public documents. Several group and individual projects are required. Additional topics will be selected from probability, discrete and continuous distributions, regression analysis and correlation, design of experiments, and hypothesis testing.

**MAT415** (Fall or Spring)

***Mathematica* and Mathematics**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Mathematical Investigations IV OR Mathematical Investigations III and permission of instructor.

Students will learn how to use *Mathematica* computer software to help model and explore mathematical topics. Much of the course will be project oriented, including creating interactive notebooks and programming, depending upon individual student backgrounds and interests. Students will work with 2D and 3D graphics, colors, and animations. No prior experience with *Mathematica* or with computer programming is necessary.

**MAT421** (Fall)**Number Theory**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: BC Calculus I (which in exceptional cases may be taken concurrently) and permission of Instructor and Mathematics Operational Coordinator

Number Theory challenges students to question the number systems they have used all their lives. The integers are defined axiomatically, and familiar properties of arithmetic are proven. Exploration then turns to divisibility, primes, and the Fundamental Theorem of Arithmetic, the GCD, and linear diophantine equations. Linear congruence problems and multiple congruences (Chinese Remainder Theorem) are followed by special congruences (Theorems of Wilson and Euler-Fermat). This is then used to study decimal expansions of rational and real numbers. Further topics may include primality testing, continued fractions, introductory cryptography, and quadratic reciprocity. This course is centered around a dual emphasis on calculation techniques and rigorous proof.

**MAT425** (Fall or Spring)**Problem Solving**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Mathematical Investigations III or recommendation of Instructor

In this course, students will learn how to apply a broad range of problem solving techniques and strategies while making inter and intra-disciplinary mathematical connections. The course will emphasize both individual and group investigations and explorations. Students will not receive credit for Problem Solving if they have prior credit in Advanced Problem Solving.

**MAT431** (Fall)**Advanced Problem Solving**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: BC Calculus I, or permission of Instructor; and Mathematics Operational Coordinator. Student should have a very strong score on the AMC contest, though need not be a mathlete.

The course will emphasize advanced problem solving techniques and strategies used on the AIME, ARML, Mandelbrot and AVASC level contests. Methods of proof, derivation, and validation will be highlighted in solutions to non-routine problems. The course content will focus upon topics from advanced geometry, combinatorics, theory of equations, series, sequences, trigonometry and number theory, etc.

**MAT435** (Fall or Spring)**Discrete Mathematics**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Mathematical Investigations III or recommendation of Instructor

This course is a study of topics that are based on concepts, ideas, and algorithms in mathematics that can, in some manner, be divided into "separate" or "discontinuous" (and thus, *discrete*) parts. Major areas of mathematical content addressed in the course can include social applications and decision making (such as voting theory), techniques of counting, permutations, combinations, probability, graph theory (including applications of paths and circuits in graphs, graph coloring, and spanning trees), recursion, algorithm development, pattern generation and recognition in a variety of contexts, Pascal-type triangles and their connection to other mathematical content, modular math, and modeling. Individual and group investigations and explorations are emphasized throughout the course.

**MAT441** (Fall)  
**MAT442** (Spring)

### **Multi-Variable Calculus**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: BC Calculus III and recommendation of Instructor

Multi-Variable Calculus will apply the tools of calculus to functions of several variables. Topics will include the algebra and geometry of vectors, a study of functions of several variables, applications of partial derivatives, multiple integrals, line and surface integrals, and (time permitting) Green's, Stokes' and Gauss' Theorems.

**MAT445**

### **Theory of Analysis**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Multi-variable Calculus or Advanced Problem Solving or Number Theory and permission of the Instructor and Mathematics Operational Coordinator.

This course provides a theoretical look at many of the important concepts studied in the BC Calculus sequence. The emphasis in this course will be upon rigorous mathematical proof. Major ideas addressed in this course include: mathematical proof, theory of sets, sequences, topology of the real numbers, limits, continuity, and differentiation. Enrollment in this course requires a high degree of mathematical maturity along with a deep understanding of the concepts covered in the BC Calculus sequence. There will be opportunity for the class to take excursions into related theory when students in the class take the lead. There will be an emphasis on group work and student presentations to the class.

**MAT451** (Fall)  
**MAT452** (Spring)

### **Differential Equations**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: BC Calculus II (or AB Calculus II with permission of Instructor)

The theory of differential equations is interesting as a mathematical topic and has special relevance because it describes a surprising diversity of real world situations. In this course, we will investigate the behavior of solutions to linear and nonlinear differential equations. Special emphasis will be given to applications in the physical and biological sciences. Upon completion of this course, a student will be able to choose, trouble-shoot, customize, or develop a variety of differential equation modeling schemes to suit his or her own particular needs.

**MAT462** (Spring)  
**MAT472** (Spring)

### **Introduction to Algebraic Structures I**

### **Introduction to Algebraic Structures II**

(Use MAT472 only if enrolled in MAT462 last year.)

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Multi-variable Calculus or Advanced Problem Solving or Number Theory and permission of the Instructor and Mathematics Operational Coordinator.

Algebraic Structures I and II are advanced course offerings for students working at a level beyond Calculus. One of the two course options described below will be chosen by the mathematics department to be taught each spring semester. Students taking the course for the first time should sign up for enrollment in Algebraic Structures I (MAT462). Students who have already received credit for course number MAT462 should sign up for enrollment in Algebraic Structures II (MAT472) after discussion with instructor or department coordinator.

**OPTION 1 (Linear Algebra)**

This course concentrates on the theory of simultaneous linear equations. Gaussian elimination is used as a tool to solve linear systems and to investigate the subspace structure of a matrix (kernel, range, etc.) Extensions of these ideas include orthogonality and least squares. Determinants are examined from several perspectives. Eigenvalues and eigenvectors are introduced, including a discussion of special matrices (symmetric, unitary, normal, etc.). Applications may include singular value decomposition and the Fast Fourier transform.

**OPTION 2 (Abstract Algebra)**

The content of this course is flexible, but is generally an introduction to abstract algebra. Students learn about groups, subgroups, homomorphisms, and the structure of various groups (such as the structure theorem for finitely generated Abelian groups, the Sylow theorems, etc.) Students also investigate the basics of rings. Ring topics include ideals and homomorphisms; PIDs, UFDs, and Euclidean domains; fields and (time permitting) field extensions including applications such as constructibility. All aspects of the course are presented with full mathematical rigor, and students are expected to produce proofs of equivalent quality to mathematics majors at a university.

**MAT705 (Fall or Spring) Computer Science in Emerging Technology**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisites: None

This course is designed to advance the student's understanding of computer science through a breadth-first survey of the field. Topics covered range from the fundamentals of the field (basic discrete mathematics and logic) to today's emergent technologies. Actual content of the course changes from semester to semester to reflect the nature of the field. Modern computing application will be examined, and the social implications of the use of technology will be explored. The course will conclude with an introduction to the current tools used by computer scientists to model real-world applications such as programming constructs and design principles.

**MAT715 (Fall or Spring) Introduction to Visual Basic**

Grade Level: Junior/Senior  
 Length: One semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisites: Mathematical Investigations III or permission of instructor AND no previous computer science coursework.

This course is an introduction to computer programming using the Visual Basic computer language. Visual Basic is intended specifically for students who wish to learn about computer programming but do not have aspirations in computer science related fields. (Any student wishing to take AP Computer Science or Computer Seminar must take Introduction to Computer Science)

**MAT725 (Fall or Spring) Introduction to Computer Science**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail Option  
 Prerequisite: Mathematical Investigations III or recommendation of Instructor

Intro to C.S. is an introduction to programming and computer science using the current APCS language (Java). The course emphasizes programming methodology concentrating on problem solving and algorithm development, using object oriented programming. It is intended to feed naturally into AP Computer Science (MAT732).

**MAT731** (Fall)**Computer Seminar**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Introduction to Computer Science or recommendation of Instructor

This course will study advanced computer science topics including object oriented programming. Students will be expected to complete several individual and group projects that will involve research, programming, and presentation of results.

**MAT732** (Spring)**AP Computer Science**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Introduction to Computer Science or recommendation of Instructor

This course will complete the AP Computer Science AB syllabus. Topics may include: recursion, stacks, queues, trees, linked lists, and advanced programming techniques including advanced sorts and searches. A major focus of the course will be an analysis of the AP Computer Science case study.

**MAT735** (Fall or Spring)**Assembly Language Programming**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Introduction to Computer Science or recommendation of Instructor

This course will introduce the students to the mathematics of computing and the specifics of assembly language programming in the context of the 80x88 family of computers. Approximately half of the semester will be spent learning the language by writing programs that manipulate text and numeric data. The remainder of the semester will be spent writing more difficult programming activities. Possibilities include, but are not limited to, specific hardware interfaces, direct screen manipulation, and interfacing assembly language routines with high-level programs.

**MAT801** (Fall)**Advanced Topics in Mathematics****MAT802** (Spring)

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisites: Multi-Variable Calculus and one of Advanced Problem Solving, Number Theory, or Algebraic Structures I and permission of Instructor and Mathematics Operational Coordinator

Students who have finished the core mathematics program and for whom there is no other appropriate mathematics course available can petition for this as an option. Student and instructor will select topics jointly. Course may be used as core mathematics course.



## SCIENCE

### SCI105 (Fall or Spring) **Scientific Inquiries - Chemistry**

Grade Level: Sophomore  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: None

Scientific Inquiries – Chemistry is a one semester course required of all IMSA sophomores. This course addresses four broad conceptual areas: physical and chemical properties of matter, states of matter, reactions, and energetics. Students encounter concepts and materials in this course through a combination of lab-based activities, guided inquiry, group discussion, and direct instruction.

### SCI115 (Fall or Spring) **Scientific Inquiries - Physics**

Grade Level: Sophomore  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: None

Scientific Inquiries – Physics is a one semester course required of all IMSA sophomores. The course addresses four broad conceptual areas: kinematics and the equations of motion, Newton's first and second laws, the conservation of energy, and Newton's law of gravitation. These laws are used to explain the mechanics of the solar system. Students encounter concepts and materials in this course through a combination of lab-based activities, guided inquiry, group discussion, and direct instruction.

### SCI125 (Fall or Spring) **Scientific Inquiries - Biology**

Grade Level: Sophomore  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: None

Scientific Inquiries – Biology is a one semester course required of all IMSA sophomores. This course addresses four broad conceptual areas: cell structure and function, metabolism, heredity, and evolution. The role of plate tectonics in the evolution of life on Earth is included. Students encounter concepts and materials in this course through a combination of lab-based activities, guided inquiry, group discussion, and direct instruction.

### SCI135 (Fall or Spring) **Methods in Scientific Inquiry**

Grade Level: Sophomore  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: None

Methods in Scientific Inquiry is a one-semester course that is required of all IMSA sophomores. The course explicitly addresses three broad areas encompassed by the nature of science: data acquisition and analysis, experimental design, and written and oral communication. Activities will support the development of basic skills across the science disciplines and promote an understanding of scientific inquiry and the nature of research.

### SCI201 (Fall) **\* Advanced Chemistry - Matter and Molecules**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Chemistry or equivalent

SCI202 (Spring)

**\* Advanced Chemistry - Reactions and Qualitative Analysis**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Chemistry or equivalent

\* Advanced Chemistry consists of two one-semester electives. Advanced Chemistry - Matter and Molecules is only offered in the fall and Advanced Chemistry - Reactions and Qualitative Analysis is only offered in the spring. Students may take either one in any sequence but it is recommended that those who plan on taking the AP or SATII examinations in chemistry take both courses. Emphasis is placed on laboratory exploration, demonstrations, discussions and problem solving to further advance the student's understanding of inorganic chemistry. Chemical concepts introduced in their sophomore science course are reintroduced and expanded upon in addition to new content. In the fall, the course focuses on laboratory skills, periodicity, electronic structure, bonding/geometry, states of matter, solutions, as well as gas phase and solubility equilibria. In the spring semester, students investigate thermodynamics, the rates of chemical reactions, acid/base equilibrium, and electrochemistry before applying many of these reaction principles to identify the ions present in an unknown solution.

SCI215 (Fall or Spring)

**\* Organic Chemistry I**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries – Chemistry or equivalent

SCI222 (Spring)

**\* Organic Chemistry II**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Organic Chemistry I

\* These courses are designed as an introduction to the main functional groups of organic chemistry and their reactions. Emphasis is placed on understanding the theory behind organic reactions that includes discussion and problem solving. Experiments are included to introduce laboratory techniques as well as to demonstrate concepts introduced in the classroom. State-of-the-art instruments will be utilized in the laboratory. IMSA is one of the few high schools in the country to have a Fourier Transform Infra-Red instrument and the only high school to have a Fourier Transform Nuclear Magnetic Resonance instrument. Connected with the course is an out of class NMR Group that meets once a week to enhance NMR theory and use of the instrument.

SCI235 (Fall or Spring)

**Biochemistry**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Chemistry or equivalent and Scientific Inquiries - Biology or equivalent

Biochemistry is the study of the substances found in living organisms and of the chemical reactions underlying life processes. This science is a branch of both chemistry and biology. The chief goal of biochemistry is to understand the structure and behavior of biomolecules. These are carbon containing compounds that make up the various parts of the living cell and carry out the chemical reactions that enable it to grow, maintain and reproduce itself, as well as use and store energy. Some of the topics to be discussed are: amino acids, proteins, carbohydrates, lipids, nucleic acids, immunoglobulins and enzymes; their structure, regulation and function. Systems of the human body; their function, regulation (hormones) and pathophysiology will also be discussed. The laboratories in Biochemistry will include separation techniques used in biology, such as molecular sieving, cellulose acetate and gel electrophoresis, and a project designed by the student.

SCI401 (Fall)

**Advanced Physics - Motion and Forces**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Physics or equivalent

This course continues the study of basic physics concepts begun in sophomore level physics. It reviews some previously covered topics and presents additional material on conservation laws, rotational kinematics and dynamics, statics, and oscillating systems. The emphasis throughout is on laboratory-based discovery, problem-solving techniques, and laboratory analysis. This course, as well as Advanced Physics – Waves and Fields, and Modern Physics is recommended for students who intend to take the AP Physics B exam.

SCI402 (Spring)

**Advanced Physics - Waves and Fields**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Physics or equivalent

This course continues the study of basic physics concepts begun in sophomore level physics. It reviews some previously covered topics and presents additional material on wave behavior, sound, light, ray optics, electricity, and magnetism. The emphasis throughout is on laboratory-based discovery, problem-solving techniques, and laboratory analysis. This course, as well as Advanced Physics –Motion and Forces, and Modern Physics is recommended for students who intend to take the AP Physics B exam.

SCI411 (Fall)

**\* Calculus-based Physics - Mechanics**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Physics or equivalent and Mathematical Investigations IV. Successful completion of AB I or BC I Calculus is strongly recommended.

SCI412 (Spring)

**\* Calculus-based Physics - Electricity/Magnetism**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Physics or equivalent and AB I or BC I Calculus. Successful completion of Calculus-based Physics – Mechanics is strongly recommended.

\* Calculus-based Physics follows the typical sequence of a university physics course. The first semester is devoted to topics in mechanics, while the second semester develops the ideas of electricity and magnetism. The major emphasis of the course is on problem-solving and calculus is used throughout. These courses are strongly recommended for students who intend to take the AP Physics C exam.

**SCI425 (Fall or Spring) Planetary Science**

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: None

The Earth is an extremely complex system. Our planet is currently in the midst of dramatic changes, with measurable effects on the biosphere, hydrosphere and atmosphere. What phenomena are causing these dramatic changes and what, if anything, can we do about it? Systems evolve because of the exchange and transformation of energy and matter between the system and its environment, and among the system's components. So to fully understand what's causing the evolution of the Earth system, we must investigate the interactions among Earth's major components, as well as the matter and energy inputs from the other bodies in the solar system and the galaxy beyond. Such an investigation has become possible only in the recent past. In the Planetary Science course, students will learn about the evolution of Earth by studying the evolution of the solar system and its many diverse examples of planetary bodies. In the process, we'll enhance our understanding of how to live on Earth in a sustainable way.

**SCI435 (Fall or Spring) Electronics**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Physics or equivalent

This is an introductory course in electronics designed for students with an interest in hands-on experience with basic electronics. Students are encouraged to discover basic electrical concepts through laboratory-based discovery, problem-solving and laboratory analysis. Projects, incorporating the knowledge gained through guided discovery, provide a culminating experience for the students. The course will address topics in both analog and digital electronics.

**SCI445 (Fall or Spring) Modern Physics**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Physics or equivalent

This course includes topics that relate to phenomena and devices of importance to modern physicists, and are beyond the scope of other IMSA Physics courses. These include: wave motion, quantum physics, atomic and nuclear physics, and special relativity. This course is recommended for students who intend to take the AP Physics B exam, in addition to Advanced Physics I and II. Students are expected to complete regular homework assignments and lab reports, read relevant articles, and participate in class discussions.

**SCI455 (Fall or Spring) Applied Engineering**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Successful completion of or concurrent enrollment in Advanced Physics – Motion and Forces or Calculus-based Physics – Mechanics

This course continues the study of physics concepts learned in previous science courses. Students will engage in a study of various engineering areas such as electrical, industrial, and mechanical. Sessions will take place on Inquiry Days and some may be offsite in collaboration with Northern Illinois University. Students will also complete team projects related to their studies in engineering, such as building and programming a robot for a specified competition.

**SCI605 (Fall or Spring) Evolution, Biodiversity, and Ecology**

Grade level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Biology or equivalent and Methods in Scientific Inquiry

This is a one-semester course that explores the diversity of living organisms and their interactions with each other and the environment. Students will investigate the biological species concept, mechanisms for evolution and speciation, causes of extinction, and patterns of biological diversity across geographic space and time. They will also study the varied ways that organisms interact with members of their own species, with different species, and with their physical surroundings. Some field trips and/or outdoor activities will be included as a part of this course.

**SCI615 (Fall or Spring) Molecular and Cellular Biology**

Grade level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Biology or equivalent, Scientific Inquiries – Chemistry or equivalent and Methods in Scientific Inquiry

This is a one-semester course that explores modern molecular and cellular biology as well as its foundation in classical genetics. Students will investigate transmission genetics, the informatics in the structure of biomolecules, as well as the function of biomolecules in the control of the cell cycle, cellular signaling pathways, and tissue development. Students will engage in emerging genetic and molecular techniques as they conduct laboratory work with the tools of modern biology.

**SCI625 (Fall or Spring) Microbes and Disease**

Grade level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Biology or equivalent, Scientific Inquiries – Chemistry or equivalent and Methods in Scientific Inquiry

This is a one-semester integrated course that explores topics related to microbes and the relationship between infection and human defense mechanisms. Topics include the germ theory, microbial structure and function, invasiveness and pathogenicity, the human immune system, epidemiology, and an introduction to emerging infectious diseases. Microbial life will be studied in the laboratory setting by using non-pathogenic microbes so that students attain the appropriate laboratory skills.

**SCI635 (Fall or Spring) Physiology and Disease**

Grade level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Scientific Inquiries - Biology or equivalent, Scientific Inquiries – Chemistry or equivalent and Methods in Scientific Inquiry

This is a one-semester integrated course that explores topics of human physiology and the changes in physiology that result from non-infectious disease or physiological conditions. Topics include cellular physiology, metabolic functions and nutrition, and changes in systems homeostasis during disease. Significant student inquiry opportunities are presented throughout the course through organ dissections, study of disease development and practical applications of lab conditions. The course ends with student-led seminars that detail their understanding of the etiology and physiology of different non-infectious diseases and conditions.

SCI641 (Fall)

**Seminar in Biology: Neurobiology**

Grade level: Senior

Length: One Semester

Credit: 0.50 Pass/Fail option

Prerequisite: Letter grade of 'A' in both Molecular and Cellular Biology and Physiology and Disease or permission of instructor.

The focus of this seminar course is the biology of the human central nervous system. We will explore the structure of the brain in comparison to homologous primate structures as well as the underlying molecular biology of brain development. We will develop an understanding of the biology of normal brain activity in motor/sensory and cognitive functions. Topics for possible seminars will include various neurological diseases and conditions (Alzheimer's, Parkinson's, Huntington's, and schizophrenia) as they illuminate brain biology. Numerous seminars will be student developed and led and based in current scientific literature.

SCI651 (Fall)

**Seminar in Biology: Ethology**

Grade level: Senior

Length: One Semester

Credit: 0.50 Pass/Fail option

Prerequisite: Letter grade of 'A' in Evolution, Biodiversity, and Ecology or permission of instructor.

This seminar course will explore animal behavior and will focus on the ecological and evolutionary processes that shape behavior. Topics will include behavioral genetics, social behavior, communication, aggression and territoriality, courtship, parenting, foraging, defense against predators, navigation and migration, and behavioral rhythms or cycles. Many of the seminars will be developed and led by students and will be based in classic and current scientific literature.

**ENGLISH****ENG100** (Full Year)**Literary Explorations I**

Grade Level: Sophomore  
 Length: Two Semesters  
 Credit: 0.50 per semester  
 Prerequisite: None

This course introduces students to a variety of genres in literature, to the processes of effective aesthetic reading, to the work of discussion and performance as a response to literature, and to the processes of writing in various forms for different purposes. Students will explore readings of aesthetic and cultural significance from American and world literature, focusing in particular on their thematic and historical connections. Commonly taught works include Homer's Odyssey, a Theban play by Sophocles, Shakespeare's Tempest or Othello, and Mark Twain's Adventures of Huckleberry Finn.

**ENG200** (Full Year)**Literary Explorations II**

Grade Level: Junior  
 Length: Two Semesters  
 Credit: 0.50 per semester  
 Prerequisite: Literary Explorations I

Students continue to develop their skills in reading, writing, discussion, and performance. Juniors will explore readings of aesthetic and cultural significance from British and world literature, focusing in particular on their thematic and historical connections. Commonly taught works include a Euripidean drama, Shakespeare's Hamlet, Joseph Conrad's Heart of Darkness, and T. S. Eliot's The Waste Land.

**ENG301** (Fall)**Topics in World Literature: Modern World Fiction**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

We will read a selection of texts spanning the twentieth century (and samples from the turn of the millennium), and the globe. We will look at this literature (mostly in the form of short fiction, ranging from such writers as Borges, Faulkner and Kafka, to Achebe, Bei Dao and Akutagawa) as defining and expressive of modernism and post-modernism, in their many facets. More specifically, we will consider kinds of, approaches to, and functions of realism; challenges to realism; what constitutes a "modern aesthetic sensibility," and what ends such a sensibility serves; and some major thematic issues particularly relevant to the twentieth century.

**ENG311** (Fall)**Belief in Question in Modern Literature**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisites: Literary Explorations II

In this course we will raise the human experience of belief as a complex of attitudes that has stimulated the literary imagination. Works by Jorge Luis Borges, Graham Greene, Bernice Rubens, John Updike, William James, and Sigmund Freud, among others, will allow us to look at belief as a phenomenon that has served to radicalize thought as well as enslave it. We will see that while belief is commonly conceived and often expressed in religious terms, it is also a human stance secured by non-sacral tethers.

ENG321 (Fall)

**Portraits of Creativity**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

We will examine the lives and work of creative people in several of the arts (including literature, music, and painting) and the sciences, posing questions concerning the nature of artistic and scientific work, the roles of the artist and scientist in our culture, and the relationship between Apollonian order and Dionysian spontaneity in creative work. Through discovery, students will consider issues of creativity in their own lives.

ENG331 (Fall)

**Film Study: History and Criticism**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

In this class, students will study the following: the development of film as an art form and method of documentation; the language of film; a selection of influential American and international films and filmmakers; genres of film criticism; methods of adapting prose to film; and cultural influences of popular cinema. Students can expect to be tested on their knowledge of film history and language, to read and write critical reviews, to research an aspect of film production, to compare print and film texts, and to demonstrate understanding of film language through a creative project. In addition to the regular daytime schedule, the course scheduling requires students to be free twice a month on Tuesday evenings between 6:00 and 9:00 P.M. for film screenings.

ENG341 (Fall)

**Gender Studies**

Grade level: Senior  
 Length: One semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

This course will examine gender as a social construction--i.e., roles, assumptions, and beliefs that are built up by societies over time. These constructions become particularly visible and important when conflicts arise; we'll examine some of these conflicts in literature and history for what they can tell us about how our ideas of gender arose. This class requires an openness to questioning many of your long-held, most-cherished assumptions about sex, gender, and sexuality. You'll also be required to read and write carefully and critically, questioning the assumptions of the authors we study.

ENG502 (Spring)

**The Idea of the Individual**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

The focus of this course is the individual: what is this being we call the individual? What is the self? What is the relationship of society, culture, and the self? Is there any such thing as a fully free individual? What forces threaten our individuality? These are just some of the many questions we will consider as we read works as diverse as Dostoevsky's Crime and Punishment, Joyce's Portrait of the Artist as a Young Man, Kafka's Metamorphosis, Shakespeare's King Lear, and a variety of poetry and short fiction, as well as supplemental selections from theologians, philosophers, psychologists and natural scientists. The whole notion of the self, from its roots in antiquity, to the revolution of evolution, to today's possibilities of genetic manipulation in human beings, certainly suggests that we need to consider this topic if we are to make meaningful, powerful choices about what we want to be, and can be, both for ourselves and in our relations with others.



ENG512 (Spring)

**Topics in World Literature: Victorian Fiction**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

This course will focus specifically on Victorian fiction, literature written between 1837 and 1901. One of our main objectives will be to explore the parallels between Britain of the nineteenth century and America of the new millennium. Much like our society today, Britain during this time was a nation facing unprecedented economic and technological growth. Through the study of the novel and the short story, this course will examine the social, political, and cultural ideology of Britain during an era in which it rose to dominance as both a nation and an empire. Some of the issues we will investigate include the effects of the industrial revolution and urbanization, the implications of advances in science and technology such as the railroad and the telegraph, and the ethics of imperialism. We will look at works by Emily Brontë, Charles Dickens, George Eliot, and H. G. Wells, among others.

ENG522 (Spring)

**Modern Irish Literature**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

Irish artists sing songs of rage and rapture that are a forming force in modern literature. In listening to them we engage with an often-comic cultural vision that is oddly energized by a fear of sex and a love of death. The course explores the fiction and poetry of seminal authors James Joyce and W.B. Yeats, and the drama of Synge and O'Casey. In addition we read, discuss and write about some of their descendents in contemporary Irish literature: fiction writers William Trevor, Edna O'Brien, Roddy Doyle; poets Seamus Heaney, Eavan Boland, Michael Longley; dramatists Brian Friel, Marina Carr and Martin McDonough. Students are provided with information about the historical scaffolding of Irish culture in order to develop an understanding of the transformative change in a society that has moved from enervating famine to the economic feasting of the "the Celtic tiger." Some of the resultant tensions are examined in class in the flowering of Irish film and Irish rock music in the 1990s. Written work ranges from short writes to full essay (including a departure essay, "Farewell to IMSA"), and there are opportunities for oral presentation and performance.

ENG542 (Spring)

**IMSATube: Non-Fiction Video Production**

Grade level: Senior  
 Length: One Semester  
 Credit: 0.50  
 Prerequisite: Literary Explorations II

Students will study the definition, history, types, production, and cultural issues of non-fiction film and video. In addition, students will learn to plan, shoot, and edit their own non-fiction videos. Skills involved in making non-fiction videos include the technical aspects of camera, editing, lighting, and sound and also planning and composing skills such as choosing a topic, shaping a focus, researching, scripting, narrating (or not), interviewing, using archival footage, and facing ethical questions about human subjects and honesty. Group skills also are developed as students cooperate on the production of the videos.

**HISTORY AND SOCIAL SCIENCE****HSS100** (Full Year)**American Studies**

Grade Level: Sophomore  
 Length: Two Semesters  
 Credit: 0.50 per Semester  
 Prerequisite: None

The American Studies survey serves a dual function at the Academy. Through a rigorous curriculum, it introduces students to college-level reading, research, and writing skills. Through compelling historical content, it seeks to foster such values as citizenship, patriotism, and stewardship. American history is an unfinished drama, an experiment unlike any that has come before. Through the use of primary documents, quantitative data, and narrative, the course seeks to enlist the students into that experiment by showing them its origins and challenging them to carry it forward into their own time.

**HSS200** (Full Year)**Topics in World Studies**

Grade Level: Junior  
 Length: Two Semesters  
 Credit: 0.50 per Semester  
 Prerequisite: American Studies

Modern culture, society and politics have assumed an increasingly global character, and this course examines the world's history and the major issues confronting its people. Selected topics include ideologies, political events, social trends, economic systems, and creative expressions drawn from major world cultures. Integrative thinking, critical analysis, research skills, and ethical awareness all play a role in students' exploration of the human past.

**HSS301** (Fall)**European History**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisites: Topics in World Studies

Our contemporary world was forged in the heat of Europe's twentieth century wars. By 1900, Europe stood astride the globe, and from this apex she slid into a fiery maelstrom of extremism, greed, and horror sucking the rest of the world with her. Fed by the blood of tens of millions, the fires of two great wars and the hammers of dictatorship destroyed Europe and changed the world. Phoenix like she rose from the ashes but now, yielding much to others, reclaimed only part of her former position of power and glory in a very different world. In this world, from East Jerusalem to England's once again green and pleasant hills, the "White Man's Burden" has made boom boxes everyman's bittersweet joy. The course will explore several dimensions of the birth, and development of the modern Europe, and its purported death at the hands of a global and non-national, nomadic power elite. Both the history and the historiography of these phenomena will be addressed. Moreover, the investigation of this specific subject matter will lead into an exploration of the nature of the historical process and will facilitate students in their acquisition of a historical consciousness, a prerequisite for leadership in any field.

**HSS302** (Spring)**International Relations**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

Nation-states play a "Great Game," to use Kipling's expression, sometimes cordial, sometimes deadly. This course will explore that game, its spirit, and its players, in the context of historical and contemporary events. Students will confront diplomatic problem through source analysis and simulation, and they will have the opportunity to attempt to resolve some of the world's most pressing problems. The course places special emphasis on the truly global issues that transcend the interests of any single state.

**HSS311** (Fall)**Political Theory**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisites: Topics in World Studies

Political Theory will survey the most significant theoretical and philosophical contributions made to Western political thought starting with the Classical Greeks. Students will be required to understand and speak of the formulation of ideas, as they concern society and politics, over the past 3,000 years. In doing so the student can see the continuities and failures in the Western effort to balance the need for security with a desire for political and individual freedoms. The introduction to these specific political theories will also potentiate the student's experience and knowledge gained in the American and World Studies courses. Students will accomplish this by reading excerpts from the actual writers, looking at the historical background, and through extensive class discussion.

**HSS321** (Fall)**Macroeconomics**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

Macroeconomics is an issues oriented course in which basic macroeconomics concepts and theories (scarcity, supply and demand, inflation, unemployment, fiscal and monetary policy) are presented through the exploration and analysis of specific political and social realities. The issues themselves are ordered so as to facilitate a logical and systematic development of macroeconomics principles, concepts and theories. An exploration of economic thought provides the background for debates, discussions, simulations, and research that will be the tools for analysis. Students will also have an opportunity to participate in a mock international currency and interest rate vehicle trading exercise that should give their newly acquired knowledge of macroeconomics concepts certain immediacy.

**HSS322** (Spring)**Microeconomics**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

Microeconomics is an issues oriented course in which basic microeconomics concepts and theories (demand and consumer choice, the firm, monopoly, oligopoly, capital, interest, profits, labor unions and collective bargaining) are presented through the exploration and analysis of specific political and social realities. The issues themselves are ordered so as to facilitate a logical and systematic development of microeconomics principles, concepts, and theories. An exploration into the historical development of the modern corporation and capitalism provides the background for debates, discussions, simulations and research that will be the tools for analysis. Students will have an opportunity to guide the fortunes of a fictitious multinational conglomerate through the hazards of a simulated international business environment that should give their newly acquired knowledge of microeconomics concepts certain immediacy.

**HSS331** (Fall)**Topics in Recent United States History**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

This course will focus on the years 1945 to the present. Recent U.S. History will present many of the topics, themes, issues, personalities, and events which are often not covered because time runs out in regular History courses. Therefore, this course will permit greater flexibility within the IMSA American Studies curriculum. The teacher and students will select units from among various themes and topics, a few of which include: The Cold War, Diversity: Counter-culture movements, Justice and Equality: Civil Rights and Civil Liberties in Post-War America, Power: Who Runs America?, The Seventies and the Issues of Scarcity and Limitations, The Significance of the Vietnam War in American History, American Post-War Popular Culture, Literature, and Movies, Evaluating the Reagan-Bush 80's: The Good or Bad Decade and many other possible options. The themes and topics will be presented, in many instances, from an inter-disciplinary perspective incorporating Science, Literature, Political Science, International Relations, Sociology, Economics, and Art and Music.

**HSS332 (Spring)                      The Second World War and the Cold War, 1937-1991**

Grade Level: Senior  
 Length: One semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

The Second World War (1937-1945) and the immediately following Cold War (1945-1991) have critically shaped the way our modern world works. Both conflicts were truly world ranging, and touched the lives of everyone on the globe. However, the Second World War has fallen prey to numerous myths and misconceptions, while the Cold War remains relatively unknown – except as a political-academic issue. The goal of this course is to facilitate the student's knowledge of the many events and ideologies that struggled across the globe for over 50 years. Much of the material covered will also potentiate the student's experience and knowledge gained in American and World Studies. Students will accomplish this by reading excerpts from the actual writers, looking at the historical context, and through extensive class discussion and debate. Knowledge gained in this course will enable the student to be an effective and intelligent participant in present political and historical discourse.

**HSS341 (Fall)                      Mind and Cosmos: A Cultural History of Astronomy**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

Astronomy serves as the perfect vehicle for the examination of the history of science and its relationship with culture as a whole. Humanity has sought to explain the phenomena of the heavens for thousands of years, and those explanations have taken a variety of forms: mythological, philosophical, and scientific. In addition, many of the revolutions in thought that have transformed humanity's views of physical nature have centered on astronomical and cosmological questions. This course will concentrate on four major themes: the development of astronomical and cosmological thought; the analysis of different approaches to truth, certainty and method; the interactions between astronomy, physics, and mathematics; and the relationship of astronomy and physics to religion and philosophy. We will trace these themes from Greek antiquity to the Newtonian universe of the Enlightenment and beyond.

**HSS352 (Spring)                      A History of Technology and Culture**

Grade Level: Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Topics in World Studies

Technology defines culture; it shapes human interactions and mediates the relationship of humanity to the physical environment. Conversely, culture defines technology; existing social structures and intellectual systems determine the nature of technical innovation. This course will examine the complex dialogue between technology and culture through a series of case studies,

distributed in time and space. In the process, we will explore a number of dominant themes in the history of technology: the role of science, the impact of warfare, the significance of economic forces, and the importance of custom and class. The course will conclude with an extended problem-based unit, as students construct a case study of their own.

**HSS362** (Spring)

**Women and Power**

Grade Level: Senior  
Length: One semester  
Credit 0.50 Pass/fail option  
Prerequisite: Topics in World Studies

For much of human history, women have been ruled politically, economically, and culturally by men. The struggle for female power constitutes an important part of the story of our past and present. This course looks at the origins of cultural thinking about women and power. We will use primary documents, literature, art, film, and documentaries to analyze where these attitudes come from. We will work back and forth between contemporary issues and current events to the historical causes that gave rise to them, tracing links between Western and non-Western societies. Three short papers (3-4 pages) and a project chosen by the student that helps explain an aspect of women and power are required.

## WORLD LANGUAGES

**WLG110** (Full Year)

### **French I**

Grade Level: Sophomore/Junior/Senior

Length: One Year

Credit: 1.0 per Year Pass/Fail option

Prerequisite: None. This course is not open to students with prior experience in French.

In this course, students begin to develop proficiency in listening, speaking, reading, and writing. Topics revolve around the students' immediate world, including self, family, friends, school and home communities, interests, food, professions, health, transportation, holidays, seasons, and clothes. Students build good pronunciation and listening skills, and read simple authentic texts. In addition this course seeks to develop and enhance an understanding of the diverse cultures of the francophone world.

**WLG120** (Full Year)

### **French II**

Grade Level: Sophomore/Junior/Senior

Length: One Year

Credit: 1.0 per Year Pass/Fail option

Prerequisite: French I and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

Students build upon the skills developed in French I (with appropriate review of previously learned material). They develop greater proficiency in listening, speaking, reading, and writing. The topical context is expanded from the students' immediate world to the world of the target cultures. Topics may include shopping, cuisine, geography, travel, wellness, leisure time activities, and careers. Students will be required to write compositions on a regular basis.

**WLG130** (Full Year)

### **French III**

Grade Level: Sophomore/Junior/Senior

Length: One Year

Credit: 1.0 per Year Pass/Fail option

Prerequisite: French II and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

In Level III, students continue to build communication skills developed in Levels I and II. Specifically, students participate actively in extended oral and written discourse, using compound and complex sentences to provide information in a coherent and fluent manner. Students narrate and describe past and present events; they predict future events. They develop critiquing skills. Students explore options in a given situation, and handle difficulties and unexpected events. They also learn to initiate and sustain a conversation, discussion, or debate. Students demonstrate these language functions in various contexts (personal, social, political, socio-economic, scientific, literary, artistic, historical and philosophical). Students keep a journal throughout the school year as a reflective process and assessment tool. During second semester students examine the social, psychological, and cultural implications of fairy tales. Reading selections include three famous French novels: Le Petit Nicolas, La Belle et la Bête, and Le Petit Prince.

**WLG140** (Full Year)

### **French IV**

Grade Level: Sophomore/Junior/Senior

Length: One Year

Credit: 1.0 per Year Pass/Fail option

Prerequisite: French III and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

**WLG150 (Full Year)****French V**

Grade Level: Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: French IV and recommendation of Instructor

Students of French IV and V are in the same class and follow the same curriculum for the academic year. The curriculum is a two-year cycle, alternating every other year. The first quarter of each year is devoted to an in-depth grammar review, and new grammatical structures will be introduced and reviewed throughout the year. Students read authentic texts that include advanced grammatical structures (i.e. passive voice, subjunctive and conditional moods, indirect discourse), and topics that are technical, scientific, philosophical, and literary.

Learning experience designs for French IV and French V include:

**Slice of Time**--an interdisciplinary approach to the study of a selected period of history, beginning with a piece of literature, a film, a historical period, a philosophical movement, or an art movement, etc. as a focal point. Examples of learning experiences are: Life in the Middle Ages and Renaissance; French Presence in Indochina; French Presence in Africa; Questions of the Individual, Identity, and Existentialism; Questions of Religion, War and Death, and the Loss of Innocence; etc.

**Visual Thinking**--based on the belief that art is essential to people's lives and is an invaluable tool in education. This study of art involves careful observation and analysis, encourages deductive reasoning, as well as speculation about possible meaning. It also requires both interpretation and judgment (adapted from material written by Amelia Arenas, Abigail Housen, and Philip Yenawine for the Museum of Modern Art's Education Department).

**Le Septième Art**—French cinéma is appreciated and renowned throughout the world. Within France, cinema is held in such high esteem that it has been called "The Seventh Art". Students will explore a particular theme as it is developed through film. Film selections may include classics, and more recent productions, as well as films from francophone countries beyond France. Examples of themes: Revolution; and, Liberty, Equality, and Fraternity.

**Current Events** - Newsworthy events regarding France, the francophone world, the European Union, and the United States will be discussed as they present themselves throughout the year. The instructor will present topics for discussion and students are encouraged to do so as well. Every effort will be made to find readings in French about current events, but some may be in English.

Level IV students continue to build on the skills from the first three levels of their study of French by developing and refining the five major skills of listening, speaking, reading, writing, and cultural competency. As the year progresses, students' written and oral French is expected to reflect advanced grammatical structures and an ever-expanding, sophisticated, precise, and eloquent vocabulary. Students become more adept at comprehending the speech of native speakers, speaking at a normal rate of speed, in most situations.

Expectations for performance and progress are higher for French V students. Students at level V of French continue to build on the five skills. Due to their experience with and exposure to the language and francophone cultures, they are expected to access and demonstrate greater mastery of the grammar and vocabulary in their written and oral communication. As the year progresses, students will be expected to demonstrate increasingly effective communication through the creative use of vocabulary in context, and grammatical and syntactical accuracy. For example, their written French will demonstrate increasing fluency, more concise expression when necessary, and greater control of the mechanics of the written and spoken language. Spoken French will reflect more accurate pronunciation, increasing fluency, and authentic French intonation.

**WLG220 (Full Year)****Spanish II**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Spanish I and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

Students build upon the skills developed in Spanish I (with appropriate review of previously learned material). They develop greater proficiency in listening, speaking, reading, and writing. The topical context is expanded from the students' immediate world to the world of the target cultures. Topics may include shopping, cuisine, geography, travel, education, wellness, leisure time activities, careers, and the 21st century. Students will also keep a journal to improve their writing.

**WLG230 (Full Year)****Spanish III**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Spanish II and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

In Level III, students continue to build communication skills developed in Levels I and II. Specifically, students participate actively in extended oral and written discourse, using compound and complex sentences to provide information in a coherent and fluent manner. Students narrate and describe past and present events; they predict future events. They develop critiquing skills. Students explore options in a given situation, and handle difficulties and unexpected events. They also learn to initiate and sustain a conversation, discussion, or debate. Students demonstrate these language functions in various contexts (personal, social, political, socio-economic, scientific, literary, artistic, historical and philosophical). Students keep a journal throughout the school year as a reflective process and assessment tool. Some of the topics covered in Spanish III are music, death, family, friendship and love, politics, environment, and poetry.

**WLG240 (Full Year)****Spanish IV**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Spanish III and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

In Level IV students continue to develop and refine the major skills of listening, speaking, reading and writing. They read and comprehend authentic texts that include advanced grammatical structures (i.e. passive voice, subjunctive and conditional moods, indirect discourse), and topics that are technical, scientific, philosophical and literary. Students' writing and speaking also reflect advanced grammatical structures and an ever-expanding, sophisticated, and eloquent vocabulary. Students become more adept at comprehending the speech of native speakers, speaking at a normal rate of speed, in most situations.

Learning experience designs include:

**Slice of Time**--an interdisciplinary approach to the study of a selected period of history, beginning with a piece of literature, a film, a historical period, a philosophical movement, or an art movement, etc. as a focal point. Some recent learning experiences have been: Medieval Spanish Literature, The Origins of the Spanish Language, Surrealist Spanish Painting, Revolutionary Movements in Twentieth Century Latin American, and Immigration: Myths and Reality.

**Visual Thinking**--based on the belief that art is essential to people's lives and is an invaluable tool in education. This study of art involves careful observation and analysis, encourages deductive reasoning, as well as speculation about possible meaning. It also requires both interpretation and judgment (adapted from material written by Amelia Arenas, Abigail Housen, and Philip Yenawine for the Museum of Modern Art's Education Department).

**Science and Ethics**--designed so that students can examine a scientific problem that affects individuals and society as a whole. The choice of "problem" may vary from year to year; however, the problem must reflect an ethical dilemma. Examples of topics are: the pros and cons of nuclear energy, the effects of oil spills, genetics engineering, euthanasia, forestry management, use/misuse of the information superhighway, the political role of environmental groups, the responsibility of the scientist in society, etc.



**WLG250 (Full Year)****Spanish V**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Spanish IV and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

In Level V, students build on the skills developed in previous years of study in order to enhance all aspects of communicative and cultural competency. The goal is to acquire greater proficiency in conversation, reading, writing, and listening comprehension. There is an in-depth review of grammar. Throughout the course, we examine aspects of Spanish culture and civilization through the study of history, literature, art and cinema.

**WLG310 (Full Year)****German I**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: None. This course is not open to students with prior experience in German.

In this course, students begin to develop proficiency in listening, speaking, reading, and writing. Topics revolve around the students' immediate world, including self, family, friends, school and home communities, interests, food, health, holidays, and clothes. Students build good pronunciation and listening skills, and read simple texts. In addition this course seeks to develop and enhance an understanding of the diverse cultures of the German-speaking world.

**WLG320 (Full Year)****German II**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: German I and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

Students build upon the skills developed in German I (with appropriate review of previously learned material). They develop greater proficiency in listening, speaking, reading, and writing. The topical context is expanded from the students' immediate world to the world of the target cultures. Topics may include shopping, cuisine, geography, travel, wellness, leisure time activities, and careers.

**WLG330 (Full Year)****German III**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per year Pass/Fail option  
 Prerequisite: German II and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

In Level III, students continue to build communication skills developed in Levels I and II. Specifically, students participate actively in extended oral and written discourse, using compound and complex sentences to provide information in a coherent and fluent manner. Students narrate and describe past and present events; they predict future events. They develop critiquing skills. Students explore options in a given situation, and handle difficulties and unexpected events. They also learn to initiate and sustain a conversation, discussion, or debate. Students demonstrate these language functions in various contexts (personal, social, political, socioeconomic, scientific, literary, artistic, historical and philosophical). Each semester students will be expected to complete a project that requires them to gather and process information in the target language. Students may be asked to keep a journal throughout the school year as a reflective process and assessment tool. They will read selected authentic texts (fiction and non-fiction) that will provide the impetus for discussions. Typical topics for German III include: Germany in the Middle Ages, The Age of Goethe, Environmental Issues, Contemporary Sociological Issues, From Aachen to Zwickau: Germany's Urban Landscape, Germany's Pop Culture, A Philatelist's Tour Through German Culture and History.

**WLG340 (Full Year)****German IV**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: German III and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

**WLG350 (Full Year)****German V**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: German IV and recommendation of Instructor

In Levels IV and V students continue to develop and refine the major skills of listening, speaking, reading and writing. They read and comprehend authentic texts that include advanced grammatical structures (i.e. passive voice, subjunctive and conditional moods, indirect discourse), and topics that are technical, scientific, philosophical and literary. Students' writing and speaking also reflect advanced grammatical structures and an ever-expanding, sophisticated, and eloquent vocabulary. Students become more adept at comprehending the speech of native speakers, speaking at a normal rate of speed, in most situations.

Learning experiences include: Slice of Time--an interdisciplinary approach to the study of a selected period of history, beginning with a piece of literature, a film, a historical period, a philosophical movement, or an art movement, etc. as a focal point. Some recent learning experiences have been: The Weimar Republic, literary selections such as Deutschstunde and Der Richter und Sein Henker, 40 Year DDR / BRD and Politics and Contemporary Germany. Other topics include:

Visual Thinking--based on the belief that art is essential to people's lives and is an invaluable tool in education. This study of art involves careful observation and analysis, encourages deductive reasoning, as well as speculation about possible meaning.

Science and Ethics--designed so that students can examine a scientific problem that affects individuals and society as a whole. The choice of "problem" may vary from year to year; however, the problem must reflect an ethical dilemma. Examples of topics are: the pros and cons of nuclear energy, the effects of oil spills, genetics engineering, euthanasia, forestry management, use/misuse of the information superhighway, the political role of environmental groups, the responsibility of the scientist in society, etc.

**WLG410 (Full Year)****Japanese I**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: None. This course is not open to students with prior experience in Japanese.

In this course, students begin to develop proficiency in listening, speaking, reading, and writing. Topics revolve around the students' immediate world, and include self, family, friends, school and home communities, interests, food, transportation, holidays, seasons, and clothes. Students build good pronunciation and listening skills, and learn to read and write in both katakana and hiragana (phonetic writing systems) and a small number of kanji/Chinese characters. In addition this course seeks to develop and enhance an understanding of Japanese culture.

**WLG420 (Full Year)****Japanese II**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Japanese I and recommendation of Instructor

Students build upon the skills developed in Japanese I (with appropriate review of previously learned material). They develop greater proficiency in listening, speaking, reading, and writing. The topical context is expanded from the students' immediate world to the world of the target culture. Topics may include shopping, cuisine, geography, travel, education, wellness, leisure time activities, careers, and the 21st century. Students will continue to develop their hiragana and katakana writing skills, and will learn more kanji.

**WLG430 (Full Year)****Japanese III**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per year Pass/Fail option  
 Prerequisite: Japanese II and recommendation of Instructor

The overall theme for Level III is "Living in Japan". Students imagine going to Japan as part of an exchange program, and within that context, they develop practical, real-world skills that they would need if they were to travel to Japan and live with a host family. They also learn more about the Japanese lifestyle and culture so that they can interact and speak appropriately with Japanese people. Level III continues the patterns established at Levels I and II. The main emphasis is still on spoken communication and communicative competency; however, students will be expected to do more reading and writing than at Level II. Furthermore, students will tackle some challenging ideas and grammatical structures, including the passive construction (which is significantly different from passive in English), the verbs of giving and receiving (which reveal much about Japanese society and mindset), and provisional, conditional, and potential tenses.

**WLG510 (Full Year)****Russian I**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: None. This course is not open to students with prior experience in Russian.

In this course, students are expected to master the Cyrillic alphabet in order to develop proficiency in listening, speaking, reading, and writing. Students are expected to master Russian penmanship. Topics revolve around the students' immediate world, including self, family, friends, home communities, interests, food, professions, health, transportation, holidays, and seasons. In addition this course seeks to develop and enhance an understanding of Russian culture.

**WLG520 (Full Year)****Russian II**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Russian I and recommendation of Instructor **or** Proficiency Exam and recommendation of Instructor

Students build upon the skills developed in Russian I (with appropriate review of previously learned material). They develop greater proficiency in listening, speaking, reading, and writing. The topical context is expanded from the students' immediate world to the world of the target cultures. Topics include cuisine, geography, education, seasons and holidays, family, and character traits. Students build good pronunciation and listening skills, and read simple authentic texts. Russian II students are required to keep a diary throughout the school year.

**WLG530 (Full Year)****Russian III**

Grade Level: Sophomore/Junior/Senior  
 Length: One Year  
 Credit: 1.0 per Year Pass/Fail option  
 Prerequisite: Russian II and recommendation of Instructor or Proficiency Exam and recommendation of Instructor

In Level III students continue to build communication skills developed in Levels I and II. Students are expected to regularly demonstrate and improve the following language skills: participate actively in class conversations, discussions, and debates; use compound and complex sentences to provide information in a coherent and fluent manner; develop critiquing skills. Students will continue to regularly write in journals for the purpose of mastering reflective thinking skills and grammatical accuracy. Reading authentic Russian literary texts is at the foundation of the Russian III curriculum. Russian III students will read short stories by Aleksander Pushkin and Anton Chekhov, as well as a selection of Russian fairytales, and poetry by various 19th and 20th century Russian poets. In order to develop better reading skills, students will read abstracts and short articles from Russian newspapers and learn to summarize their content. Written assessments will include short writes, quizzes, and longer essays. Oral performance will be assessed by means of class contributions and in-class presentations.

**WLG701 (Fall)****Literature and Language Through Culture**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50; Pass/Fail Option NOTE: This course may not be used to satisfy the 2.0 credit World Languages graduation requirement.  
 Prerequisite: None

In "Literature and Language Through Culture" students will read, discuss, and analyze literature, originally written in languages other than English. The literary selections will represent different historical periods and cultures. Students will develop deeper and broader cultural competency by reading, comparing, and contrasting exemplars of literature from varied and diverse cultural sources. Students will have numerous opportunities to discern and create connections, discovering universal themes in the literary works read that cross cultural traditions and historical epochs. In the process, they will also grapple with the concept of language. Students will learn to recognize the filters that shape conceptions and personal views of the world. They will develop an aesthetic awareness and capacity. Students will learn about the human experience and its interrelatedness. As a result of this course, students will develop much of the understanding and many of the skills necessary to become global leaders. Students will continue development of communicative competency through writing, speaking, and listening, in small group and whole class activities.

**WLG712 (Spring)****Explorations in Linguistics**

Grade Level: Junior/Senior  
 Length: One Semester  
 Credit: 0.50; Pass/Fail Option NOTE: This course may not be used to satisfy the 2.0 credit World Languages graduation requirement.  
 Prerequisite: None

This is a one semester survey course in the scientific study of language. Topics include the "core" areas of linguistic theory (morphology, syntax, semantics, and phonology) along with other important areas (phonetics, sociolinguistics, psycholinguistics, language acquisition, and practical applications of the above). The skills acquired can lead to increased cultural awareness and appreciation, improved knowledge and application of the language acquisition process, and "world-oriented," multicultural thinking that will enable tomorrow's leaders to better shape the world they live in. Students will engage in problem-based learning exercises and original research in a subfield of their choice to explore the nature, structure, function, and evolution of language using tools and methodologies employed by professional linguists.

This course provides an opportunity for students to learn more about language in a general sense and as a construct, as opposed to focusing on one particular language or culture. This fosters an improved focus on linguistic pluralism that will carry over to greater appreciation for all forms of communication and increased interest in further pursuing already-acquired languages, in the acquisition of a new language, or in pursuing further study in linguistics.

## FINE ARTS

**FAR101** (Fall)  
**FAR102** (Spring)

### **Concert Band**

Grade Level: Sophomore / Junior / Senior  
Length: One or Two Semesters  
Credit: 0.50 - 1.0 Pass/Fail option  
Prerequisite: Audition and approval of instructor

Students enrolled in Concert Band will have the opportunity to study, rehearse and perform several styles of Concert Band literature at the high school music grade 4 and 5 levels. Students will perform in four formal concerts, as well as participate in the IHSA Organizational Music Contest. Students have the opportunity for auditioning for the IMEA All-District and All-State Organizations. Concert band will combine with the Wind Ensemble for marching.

**FAR111** (Fall)  
**FAR112** (Spring)

### **Wind Ensemble**

Grade Level: Sophomore / Junior / Senior  
Length: One or Two Semesters  
Credit: 0.50 - 1.0 Pass/Fail option  
Prerequisite: Audition and approval of instructor

Students enrolled in Wind Ensemble are placed in this ensemble through an audition prior to enrolling. Students will play advanced Band literature at the high school music grade 5 and 6 levels. Students will perform on four formal concerts, as well as participate in the IHSA Organizational Music Contest. Students also have the opportunity for auditioning for the IMEA All-District and All-State Organizations. Principal chairs will have the responsibility of playing in Orchestra. Wind Ensemble will combine with the Concert Band for marching. Expectations in this group are extremely high.

**FAR121** (Fall)  
**FAR122** (Spring)

### **String Orchestra**

Grade Level: Sophomore / Junior / Senior  
Length: One or Two Semesters  
Credit: 0.50 - 1.0 Pass/Fail option  
Prerequisite: Audition and approval of instructor

Students enrolled in String Orchestra will have the opportunity to study, rehearse and perform various styles of music. Music will be the high school levels of grade 3, 4 and occasionally 5. Students will perform four, formal concerts each year, and will participate in the IHSA Organizational Music Contest, as well as have the ability to audition for the IMEA All-District and All-State ensembles.

**FAR131** (Fall)  
**FAR132** (Spring)

### **Chamber Strings**

Grade Level: Sophomore / Junior / Senior  
Length: One or Two Semesters  
Credit: 0.50 - 1.0 Pass/Fail option  
Prerequisite: Audition and approval of instructor

Students enrolled in Chamber Strings are the top 20-25 string players in the Academy. Enrollment is by audition. Students will immerse themselves in both string orchestra and chamber ensembles. Music levels will be the high school music levels of grade 5 & 6. Students will perform in four formal concerts each year. Students will participate in the IHSA Organizational Contest and the IMEA All-District and All-State. This is a very advanced group. To be in this organization, private lessons are necessary, either at IMSA or outside.

**FAR201** (Fall)  
**FAR202** (Spring)

### **Concert Choir**

Grade Level: Sophomore/Junior/Senior  
 Length: One or Two Semesters  
 Credit: 0.50 - 1.0 Pass/Fail option  
 Prerequisite: First Semester: Basic level ability of matching pitches.  
 Second Semester: Satisfactory completion of one semester of Concert Choir or Chamber Choir or permission of instructor based on audition.

This course provides students with the opportunity to explore choral music on many levels. As performers they will discover and practice multiple aspects of singing including the development of proper vocal technique, the interpretation of music with stylistic and historical accuracy and the synergy of ensemble singing. Students will develop critical thinking and problem solving skills through rehearsal in small and large group settings, score study, regular sight-singing experiences as well as through observation and critiques of both their own and other ensembles' performances. Two major concerts are scheduled each semester. (Students enrolled in the Music Program are eligible to participate in any music sponsored co-curricular activity.)

**FAR211** (Fall)  
**FAR212** (Spring)

### **Chamber Choir**

Grade Level: Junior/Senior  
 Length: One or Two Semesters  
 Credit: 0.50 - 1.0 Pass/Fail option  
 Prerequisite: Participation in IMSA Concert Choir or by audition, moderate to good music reading skills, and instructor's approval.

This course provides experienced singers with the opportunity to explore and perform advanced-level choral literature. Both semesters provide opportunities for solo, as well as small and large ensemble singing through many diverse performing venues. Emphasis however, is on Renaissance and a cappella music culminating in a series of madrigal concerts. Students will be challenged to continue developing their musical literacy, interpretive performing skills and aesthetic sensitivity through their study of a great variety of choral music. Two to four major concerts are scheduled each semester. (Students enrolled in the Music Program are eligible to participate in any music sponsored co-curricular activity.)

**FAR301** (Fall)

### **Music Theory**

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: Ability to read in treble and bass clef. Solid instrumental foundation such as piano.

Music Theory is open to any student with a solid music background interested in learning the principles of writing and analyzing music. Students will learn the elements of music theory, including intervals, chord progressions, harmony, transposition, voicing, arranging and ear training. This is a course for students who do not play a band or orchestra instrument and would like to have a music course satisfy their Fine Arts credit requirement. Knowledge of the Sibelius notation system is helpful, but not mandatory, as much work will be completed in the Music Theory lab.

**FAR402** (Spring)

### **Art Design**

Grade Level: Sophomore/Junior/Senior  
 Length: One Semester  
 Credit: 0.50 Pass/Fail option  
 Prerequisite: None

Students will investigate the elements and principals of design through various styles and periods of art and art history. Students will create both two and three-dimensional solutions to design problems encountered. An emphasis will be placed on drawing, problem solving, aesthetics and reflection.

**FAR405** (Fall or Spring)**Ceramics**

Grade Level: Sophomore/Junior/Senior

Length: One Semester

Credit: 0.50 Pass/Fail option

Prerequisite: None

This course will provide students with the opportunity to explore methods of working with clay including hand building and throwing on the potter's wheel. Students will solve design problems in clay by considering aesthetic, historical, and technical processes related to ceramics. Students will have the opportunity to investigate traditional as well as new advances in technology with their learning, including firing methods, clay and glaze formulation and function. Demonstration of student learning will take place through production, critique and self-assessment.

**FAR415** (Fall or Spring)**Photography**

Grade Level: Junior/Senior

Length: One Semester

Credit: 0.50 Pass/Fail option

Prerequisite: None

This course will provide students with the opportunity to obtain a general overview of the uses for and history of photography. The course is specific to black and white photography. Students will learn to use photographic and aesthetic terminology and obtain practice in picture taking, film processing, printing, and professional display techniques. Through these experiences, students will gain confidence in both creating and evaluating photography as an art form. Students must supply their own 35mm SLR cameras and batteries.

**FAR425** (Fall or Spring)**Advanced Ceramics**

Grade Level: Junior/Senior

Length: One Semester

Credit: 0.50 Pass/Fail option

Prerequisite: Ceramics and recommendation of Instructor

This course will provide students who have proven themselves proficient in basic Ceramics, an opportunity to perfect basic skills, explore advanced techniques, and express their interests and creativity through individualized projects. Students in Advanced Ceramics will attend class with Ceramics students, but will be given individualized instruction appropriate to their skill level.

## WELLNESS

**WEL105** (Fall or Spring)

### **Moving and Learning**

Grade Level: Sophomore  
 Length: One Semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: None

This semester-long course is the core wellness class for all sophomores. It is designed to develop physically educated individuals who have the knowledge, skills, and confidence to enjoy a lifetime of healthful physical activity. This activity-based course emphasizes the kinesthetic concepts and principles of motor learning, motor development, biomechanics, and health-related physical fitness. Learning experiences will focus on tactics and strategies for a variety of physical activities, conceptual understanding of improving motor performance and physical fitness. Additional focus will be placed upon the importance of nutrition and sleep as they relate to overall fitness and stress management.

**WEL201** (Fall)

### **Tennis and Badminton**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

This tennis and badminton course will follow a tactical games approach and sports education model in order for students to understand and demonstrate tennis tactics, skills, and positive sporting behavior, etiquette, safety and fair play. As tactical complexity increases, students will develop understanding and performance of skills that enable them to make successful shot selection and placement and court positioning. Biomechanical principles of movement will be integrated in the learning experiences to enhance the connection between science and sport. Students will participate in game play involving singles, doubles and mixed doubles. All students are encouraged to have fun as they discover the tactical and social aspects of tennis and badminton.

**WEL211** (Fall)

### **Golf and Indoor Games**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

Golf is part of the wellness required elective program at IMSA that allows students to explore a variety of physical activities and sports in depth. It is a quarter long class that is designed to help students develop the tactics and skills necessary to play the game of golf. It includes an understanding of the history, rules, etiquette, strategies, and the social, emotional, and physical values of the game. Students experience practice and play at a driving range as well at actual golf courses.

The quarter-long Indoor Games course is a Wellness Elective that is comprised of multiple motor skills to produce further development and success in games and sports. Students will actively participate in athletic opportunities and leisure-time activities to build on the skill and health-related fitness experiences introduced in the sophomore curriculum. Activities will include pickleball, floor hockey, multicultural games and team building challenges. The emphasis of skills is placed on how they can be used in real play, real life, and real environments using the tactical approach to game understanding. Outcomes aimed at positive group interaction, collective achievement, culture, change, conflict resolution, cooperation, empathy and tolerance will guide course objectives so that all students can achieve success as physically educated learners in a group situation.



WEL221 (Fall)

**Lifeguarding and Water Polo**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

Basic rules, techniques, and strategies of water polo will be discussed, demonstrated, and implemented in game situations. Elements of the tactical games approach to understanding sports will be used. Olympic water polo videos will be shown. Students will be assessed on skill and strategy improvement through use of video-taping. Ability to swim one length of the pool (25 yards) and tread water for at least two minutes is required.

The lifeguarding class is a certification program through the American Red Cross for those students at least 15 years of age on or before the last scheduled session, and wishing to be lifeguards at summer pools or at IMSA for work service. There are two swimming pre-requisites for this course which all students must successfully complete the first class session. They are:

1. Swim 300 yards continuously using breaststroke and front crawl (100 yards front crawl, 100 yards breaststroke, 100 yards front crawl-breaststroke combo).
2. Timed Event: Swim 20 yards using front crawl or breaststroke, surface dive to a depth of 7-10 feet, retrieve a 10 pound object, return to the surface, and swim 20 yards back to the starting point with the object. Exit the pool without using steps or ladder. Timed event must be completed in 1 minute 40 seconds or less.

There are two certifications earned with the successful completion of this course: Lifeguard Training and First Aid (valid for three years), and CPR for the Professional Rescuer (valid for one year). A \$14.50 Lab Fee is required for the CPR portion of this class.

WEL231 (Fall)

**Outdoor and Indoor Games**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

This semester long course is comprised of multiple motor skills to produce further development and success in games and sports. Students will actively participate in athletic opportunities and leisure-time activities to build on the skill and health-related fitness experiences introduced in the sophomore curriculum. Activities will include games and activities from invasion, net/wall, striking/fielding and/or target categories. Students will be exposed to the tactical approach to learning games and activities drawing connections of both the strategies and skills associated with the games in each category. They will become thinking players, learning to react to and deal with the challenge presented in a game situation. This approach to learning game play provides quality opportunities for the student to give and receive feedback.

WEL302 (Spring)

**Beginning and Intermediate Swimming**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

For students who would like to learn to swim better but need one on one attention to progress beyond non-swimmer status. Starting with basic floats and glides, the student will progress to elementary backstroke and crawl stroke during beginning swimming and will learn sidestroke, backstroke, and breaststroke during the intermediate level. In addition, the swimmer's ability to swim farther continuously will be improved with the idea of using swimming as a fitness activity.

WEL312 (Spring)

**Dance: Ballroom and Multicultural**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

In Ballroom Dance, the basic steps of waltz, fox trot, swing, cha cha, tango, salsa, merengue and other current dances will be covered. Good leading and following techniques, dance patterns, transitions, rhythm, tempo and style will be emphasized throughout. Students will move toward creating their own dance patterns. Beginning and intermediate Multicultural Dance dances will allow the students to experience various styles and rhythms along with historical context. Circle, partner, solo, and mixers danced to traditional music will enable participants to cross cultures and participate in the nonverbal language of dance.

WEL322 (Spring)

**Badminton and Tennis**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

This badminton and tennis course will follow a tactical games approach and sports education model in order for students to understand and demonstrate tennis tactics, skills, and positive sporting behavior, etiquette, safety and fair play. As tactical complexity increases, students will develop understanding and performance of skills that enable them to make successful shot selection and placement and court positioning. Biomechanical principles of movement will be integrated in the learning experiences to enhance the connection between science and sport. Students will participate in game play involving singles, doubles and mixed doubles. All students are encouraged to have fun as they discover the tactical and social aspects of badminton and tennis.

WEL332 (Spring)

**Basketball and Soccer**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

Basketball is part of the wellness required elective program at IMSA that allows students to explore a variety of physical activities and sports in depth. It is a quarter long class that is designed to help students develop the skills, tactics, and strategies necessary to play the game of basketball. The tactical approach will be utilized so that students learn the "overall picture" of how basketball is played effectively. Skills and strategies will be taught as they will be used in the game, not in isolation. Basic rules will be learned, and student will gain an appreciation for the history of the game. In addition, the social, emotional, and physical; values of the game are explored. Students will experience half and full court game play throughout the course. Video-tape assessments of skill and understanding will be used.

Soccer, the world's number one sport, is part of the wellness required elective program at IMSA that allows students to explore a variety of physical activities and sports in depth. It is a quarter long class, and is paired with basketball because it gives students the opportunity to develop eye-hand and eye-foot coordination in the same semester by engaging in two fast-moving sports which are also excellent for developing cardiovascular endurance. This quarter-long course is designed to help students develop the skills, tactics, and strategies necessary to play the game of soccer. Skills and strategies will be taught as they will be used in game play, not in isolation. Basic rules will be learned and student will gain an appreciation for the history of the game. In addition, the social, emotional, and physical values of the game are explored. Students experience skill drill work, skill assessments, modified soccer games, and full-length field soccer games throughout the course.

**WEL342** (Spring)**Adolescent Issues and Volleyball**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

This elective is designed to provide learning experiences that allow students to explore methods relevant for managing stress in today's world. Students will learn mind/body techniques such as yoga, pilates, and tai chi for improved health and wellness.

During the semester this elective offers an opportunity for students to participate in recreational volleyball. Students will participate in a games-based approach to learning volleyball by integrating tactics, strategies, and skills during game play.

**WEL505** (Fall or Spring)**Bowling and Fencing**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

The quarter-long Bowling elective includes a historical and cultural overview; basic skills, techniques, and strategies; care and selection of equipment; and personal safety procedures and practices. Most of the instruction will take place off-campus at a local bowling facility and a bowling fee is required. This class will provide an authentic experience for students to explore the recreational and social values of bowling.

The quarter-long Fencing elective includes a historical and cultural overview; basic skills and techniques of foil fencing; rules, strategies, and etiquette of bouting; care and selection of equipment; personal safety procedures; and officiating practices. Students will have opportunities to participate in tournament competition using manual scoring techniques.

**WEL515** (Fall or Spring)**Individualized Physical Fitness**

Grade Level: Sophomore/Junior/Senior  
 Length: One semester  
 Credit: 0.5 Pass/Fail Only  
 Prerequisite: Wellness or Moving and Learning

This elective is a semester long course that will enable students to extend their knowledge and practice in all health-related fitness components as well as any of the skill-related components of their choice. As a member of the common exercise group, students will have the opportunity to establish factors that enable exercise adherence for themselves and others. There will be frequent guidance, support, and structures for periodic evaluation and motivation of individual fitness plans. This course is designed for a mature, self-motivated exerciser who is willing to extend their potential for physical development.

## STUDENT INQUIRY AND RESEARCH

SIR100 (Junior Full Year)  
 SIR103 (Rising Junior Summer)  
 SIR200 (Senior Full Year)  
 SIR203 (Rising Senior Summer)

Grade Level: Junior/Senior  
 Length: Two Semesters. Students must discuss plans with and get permission from the SIR Coordinator before enrolling in SIR.  
 Credit: 1.0 Note: SIR credit does not fulfill any graduation requirement.  
 Prerequisite: Permission of SIR coordinator

Student Inquiry and Research (SIR) is an interactive partnership that pairs students with on-campus and off-campus professionals so that they can actively pursue an in-depth investigation into a topic that they are passionate about. The SIR standards center on planning, investigating, analyzing, and communicating. Requirements include a proposal, investigation journal, active engagement, progress report, final paper, and presentation at IMSAloquium. Due to the independent nature of this course, active investigations must be started before the end of September or students will be dropped from course enrollment. SIR does not count toward the minimum course requirements for graduation, and maximum course credits apply as stated in the student handbook. SIR receives a "pass with distinction," "pass," or "fail" grade, assessed by the coordinator of Student Inquiry and Research in consultation with the SIR advisor. Students may enroll in SIR for both their junior and senior years; all SIR enrollment requires permission from the SIR Coordinator.

Dr. Judy Scheppler is the Student Inquiry and Research Coordinator. She can be reached via email at [quella@imsa.edu](mailto:quella@imsa.edu), by telephone at (630) 907-5899, or in her office in the Grainger Center for Imagination and Inquiry.

## TALENT

TALENT stands for *Total Applied Learning for Entrepreneurs*. Student investigations in this program focus on entrepreneurship and technologies that would benefit mathematics and science businesses. See the [IMSA news story](#) for a program overview. The [concept proposal](#) (PDF, 126k) gives more insights on program motivations, objectives and strategies.

TALENT provides the student with learning opportunities across a wide expanse of technology, business, and entrepreneurship. Its goal is to instill the thinking patterns and mindset of a technical entrepreneur and to engage the student in career opportunities that may influence their studies, college choices, professional choices, and other life-decisions. To provide these learning opportunities, IMSA has blended together a mixture of both [Internal Components](#) and [External Components](#). Students can [enroll](#) in TALENT Students by discussing their plans with the TALENT Program Director. During that discussion they will [choose various components](#) to comprise their TALENT Portfolio. Non-TALENT students can choose to take TALENT components a la carte, and experience those that are of particular interest to them. Students who successfully complete the program are eligible for TALENT recognition on their transcript and they are also eligible for a variety of TALENT scholarship opportunities.

The TALENT Program is intended to be a 2-year program, started in the Junior year. Sophomores are eligible to enroll in the TALENT Program, provided they have room in their schedule.

At this time participation in the TALENT program does not earn Academy credit.

Mr. Nick Scholtes is the TALENT Program Director . He can be reached via email at [nscholte@imsa.edu](mailto:nscholte@imsa.edu), by telephone at (630) 907-5949, or at his office in B104A.

## **Independent Study**

Independent Study is a student-selected learning experience that goes beyond the IMSA course catalog. Unlike Student Inquiry and Research, Independent Study lacks a focusing question and is driven by a curriculum that is largely teacher-directed. Except with the Principal's permission, an Independent Study may only be conducted by a senior under the direction of an IMSA faculty member for one or two semesters. A proposal for an Independent Study, consisting of a learning contract must be submitted to the Curriculum and Assessment Leadership Team by the faculty advisor and student no later than the last class day of the third quarter in the student's junior year. An Independent Study counts as 0.5 credits each semester in a student's course load and receives a "pass with distinction," "pass," or "fail" grade, assessed by the advisor. It does not count towards the course requirements for graduation, and maximum course credits apply, as stated in the student handbook. If a student enrolls in an Independent Study because he or she has exhausted the IMSA course catalog in a certain field, he or she may, with the advisor's consent, appeal to the Principal that the credits earned in Independent Study be applied towards graduation.

## **Illinois Virtual High School (IVHS)**

IVHS offers a number of on-line courses. Currently, IMSA students may enroll in an IVHS course for credit on a Pass/Fail basis, if the course was developed and is taught by an IMSA faculty member, and if the student is not able to enroll in the equivalent face-to-face course. Students who wish to enroll in an IVHS course need to get approval from their counselor. Information about IVHS can be found at the following website <http://www.ivhs.org/index.learn?action=welcome&bhcp=1>.