High School Achievement Program

2017 - 2018
Course Catalog

FINAL 4/2017

Business Law

BLAW 240 Business Law I

An introduction to the legal system and the basic legal concepts pertinent to the structure, management and operation of businesses. This course will also examine current trends and issues relevant to the legal and ethical responsibilities of business. *Prerequisite:* placement at ENGL 110 or higher. 3 sem. hrs. 3 crs.

BLAW 240 Learning Objectives

The learning objectives for the Business Law I course include a substantial range of legal and ethical topics within the business environment. Students will improve basic deductive reasoning skills and will acquire knowledge of both basic and advanced topics within the subject matter presented. Students will be engaged in learning activities that will enhance their competency skills in writing, critical thinking, oral communication, and information literacy. Upon completing this course, students should be able to apply their knowledge and their skills to identify and analyze sophisticated legal and ethical issues in the business environment and apply the relevant legal concepts to address those issues. Specifically, they will be able to:

1. Discuss and apply the principles regarding the legal environment of business and business ethics and corporate social responsibility.
2. Apply the laws of corporate governance to management decision making.
3. Identify and discuss the legal relevance of different corporate structures.
4. Identify, discuss and/or describe various laws and legal concepts related to business law and its application to business entities.
5. Develop skills to identify and critically analyze legal and ethical issues in business situations and fact patterns and apply relevant legal concepts to address those issues.

Computer Information Systems

CISC/MATH 120 Introduction to Computers and Application Software

An introduction to computers and computing including the fundamentals of computer nomenclature, particularly with respect to personal computer hardware and software and the World Wide Web; develop an understanding of why computers are essential components in the business world and society in general; focus on the computer as a valuable productivity tool; present strategies for purchasing, and maintaining a personal computer system. This course has a wide-ranging hands-on lab component, which includes an introduction to and actual use of; word processing, spreadsheet, presentation, and Internet browser software. *Prerequisites:* ENGL 109 level or departmental approval. Students passing a CISC 120 challenge exam may substitute a liberal arts elective for this course. 3 sem. hrs; 3 crs.

CISC/MATH 120 Student Learning Outcomes:

At the completion of the course, students will be able to:

1. identify and describe important and current issues facing the field of computers and computing, including computer and information security, information privacy and protection, ethics and intellectual property rights, computers and health, the environment, and emerging technologies.

2. identify and describe the different hardware and software components of a computer and explain how these parts interact.
3. browse and search the World Wide Web, and search different databases to get scholarly and trade articles as well as other information as required for assignments, research papers, or other projects.
4. interact with a computer to issue the most common operating system commands (using Microsoft Windows 10).
5. complete assignments and projects that need the use of a word processor (Microsoft Word), a spreadsheet (Microsoft Excel), presentation software (Microsoft Power Point), database software (MS Access) or html, and browser software (Internet Explorer/Firefox/ Chrome).

English

ENGL 111 Written English and Literary Studies I

Introduction to elements of expository writing and research methods through the study of literary texts (nonfiction genre). Students read and examine these texts in order to formulate essays in several rhetorical modes. Placement determined by the English faculty. 3 sem. hrs. 3 crs.

Course Goals:

1) To introduce students to literary essays and the rhetorical situations within them
2) To understand and practice the writing process, which includes reading, pre-writing, drafting, writing, editing, and revising
3) To write in several rhetorical modes using the prose, analytical, and organizational strategies associated with each
4) To develop students' critical thinking and reading skills
5) To recognize and develop elements of grammar, punctuation, style, and MLA documentation

Student Learning Outcomes:

By the completion of the course, students should be able to:

1) use close reading strategies to fuel analytical discussions of literary texts
2) write clear, coherent essays in several rhetorical modes
3) recognize and adhere to conventions of grammar and MLA style

ENGL 112 Written English and Literary Studies II

Students read and critically analyze literary works (fiction and/or drama). Students compose a full-length research essay based on assigned topics. Prerequisite : ENGL 111. 3 sem. hrs. 3 crs.

Course Goals:

6) To continue developing critical reading skills

7) To continue refining one's writing process, including: reading, pre-writing, drafting, editing, and revising
8) To learn to situate oneself in a critical debate, thinking critically about the ways texts interact and intersect
9) To write competently in the rhetorical modes, using textual evidence to support ideas
10) To practice and refine elements of grammar, punctuation, style, and MLA documentation

Student Learning Outcomes:

By the completion of the course, students should be able to:

1) use close reading strategies to fuel analytical discussions of literary texts
2) write clear, coherent essays in rhetorical modes while incorporating and evaluating evidence and support
3) recognize and adhere to conventions of grammar and MLA style
4) demonstrate advanced research methods, including the selection and citation of credible scholarly sources and the creation of an annotated bibliography

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Economics

ECON 120 The World of Business

This course introduces students to the world of business. The course presents the methods and practices that are used not only in business organizations but also in health care, education, government, and other organizations. With its coverage of management, marketing, finance, and information systems, the course provides a broad foundation for further study of these areas as well as useful knowledge for the workplace. 3 sem. hrs. 3 crs.

ECON 120 Course Goals

Students will acquire essential knowledge of the theories and practices of management, marketing, finance, and information systems that are used in virtually every type of organization. Students will be engaged in learning activities that will enhance their skills in writing, critical thinking, quantitative reasoning, oral communication, and information literacy. Upon completing this course, students should be able to apply their knowledge and skills to a wide variety of situations in the workplace.

Learning Objectives

1. Discuss key theories and practices of management: finance, information systems, human resource management, accounting, and marketing.
2. Apply key theories and practices of management (finance, information systems, human resource management, accounting, and marketing) within a variety of settings.
3. Discuss how management, marketing, law, finance, technology, sociology environment, and ethics relate in the business world.
4. Develop research skills to analyze the current environment of management.

History

HIST 101 European History to 1500

An overview of European history from antiquity to 1500: the rise and fall of Greece and Rome; the Middle Ages; the Italian and Northern Renaissance; the beginning of the Reformation. Extensive map work is required. 3 sem. hrs. 3 crs

HIST 101 STUDENT LEARNING OUTCOMES:

- Students should be abler to demonstrate proficiency in critical reading and thinking by providing written evaluations of texts. Primary and secondary texts.
- Students should be abler to demonstrate proficiency in critical reading and thinking by providing written evaluations of texts.
- Students should be able to demonstrate historical knowledge of various and specific time periods and geographic regions through quizzes, exams, oral, and written assignments.
- Students should be able to demonstrate understanding of historical methods, analytical skills, and critical writing in forms of in-class assignments and assigned essays.
- Students should be able to demonstrate improved writing skills and show proficiency in appropriate grammar and syntax. Students must also be able to evaluate primary and secondary sources through an array of writing and oral assignments.

HIST 102 European History Since 1500

An overview from the Reformation to the present: Luther, Calvin, the Counter Reformation; the Age of Discovery; absolutism and parliamentarianism; the Scientific Revolution and the Enlightenment; the French Revolution and the Napoleonic Era; the development of political and economic ideologies; World War I; the Russian Revolution; the emergence of Fascism and Totalitarianism; World War II and its aftermath. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 102 STUDENT LEARNING OUTCOMES:

- Students should be able to understand and recognize critical analysis of primary and secondary sources.
- Students should be able to critically read and provide written responses in European history.
- Students should be able to understand change over time within a historical context with respect to social, religious, political, economic, and/or technological forces among the various societies.
- Students should be able to analyze cause and effect relationships while demonstrating a sense of historical time.

HIST 105 American History through 1877

A general survey from the Age of first contact through the end of Reconstruction, covering such major developments as the emergence and growth of the 13 colonies; the founding and organization of the nation state; changing political, social, and economic patterns; and the origins and impact of the Civil War. Extensive map work is required 3 sem. hrs. 3 crs.

HIST 105 Learning Objectives of this course are to:

1. Improve the quality of the student's mind so that at the end of the term he/she will think, speak and write more logically, critically and effectively.
2. Give students a basic introduction to the study of history and its implications for the present and future.
3. Survey major political, social and economic trends, giving attention to the individual, institutions and cultural transformation that have shaped the American history.
4. Eliminate the fallacies and oversimplification with which students are likely to view the American past, substituting analysis and a more complex picture.

HIST 106 American History Since 1877

A general survey from the end of Reconstruction to the recent past. Major themes will be the development of American domestic politics; the nation's emergence as a world power; changes in American society, economy, and culture; and the influence of past events on contemporary life. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 106 STUDENT LEARNING OUTCOMES:

- Students should be able to understand and recognize critical analysis of primary and secondary sources.
- Students should be able to critically read and provide written responses in American history.
- Students should be able to understand change over time within a historical context with respect to social, religious, political, economic, and/or technological forces among the various societies.
- Students should be able to analyze cause and effect relationships while demonstrating a sense of historical time

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Mathematics

MATH 201 Pre-Calculus

An introduction to real-valued functions and their graphs including polynomial, rational, exponential, logarithmic, and trigonometric functions. Functions will be represented symbolically, numerically, graphically, and verbally. Real-world applications will be used to introduce the concepts. Graphing calculators will be used throughout the course. *Prerequisite:* MATH 116 or a minimum grade of B in high school intermediate algebra. 2 sem. hrs. 2 hrs. lab, 3 crs.

MATH 201 Learning Outcomes

1. Students will know how to read and interpret graphs of linear, quadratic, polynomial, exponential, logarithmic and trigonometric functions that will support success with other outcomes.
2. Students will raise their comfort level when approaching a multi-step mathematical problem.
3. Students will be prepared to tackle the challenges of higher mathematics and computer science.
4. Students will know how to set up and solve word problems involving linear, quadratic, exponential, logarithmic and trigonometric equations.

MATH 260 Calculus I

A review of elementary functions using numerical, graphical and algebraic techniques; limits; derivative and its definition; interpretation of derivatives and their application to problems of optimization. Particular emphasis is given to the use of technology to understand the concepts and to solve real-world problems. *Prerequisite:* MATH 201 or the equivalent. 4 sem. hrs. 4 crs. (Offered in fall and summer semesters.)

MATH 260 Learning Outcomes

Upon completion of the course, students will be able to:

1. Interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modeled by the function.
2. Verify the value of the limit of a function at a point using the definition of the limit.
3. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques including L'Hospital's rule.
4. Find points of discontinuity for functions and classify them.
5. Interpret the derivative of a function at a point the as the instantaneous rate of change in the quantity modeled and state its units.
6. Interpret the derivative of a function at a point as the slope of the tangent line and estimate its value from the graph of a function
7. Sketch the graph of the derivative from the given graph of a function.
8. Compute the value of the derivative at a point algebraically using the (limit) definition
9. Derive the expression for the derivative of elementary functions from the (limit) definition.
10. Show whether a function is differentiable at a point.
11. Compute the expression for the line tangent to a function at a point
12. Compute the expression for the derivative of a function using the rules of differentiation including the power rule, product rule, and quotient rule and chain rule.
13. Compute the expression for the derivative of a composite function using the chain rule of differentiation.
14. Differentiate a relation implicitly and compute the line tangent to its graph at a point.
15. Differentiate exponential, logarithmic, and trigonometric and inverse trigonometric functions.
16. Obtain expressions for higher order derivatives of a function using the rules of differentiation.
17. Interpret the value of the first and second derivative as measures of increase and concavity of functions.
18. Compute the critical points of a function on an interval.
19. Identify the extrema of a function on an interval and classify them as minima, maxima or saddles using the first derivative test.

Spanish

SPAN 115 Spanish for Communication

A beginning Spanish course designed to help develop listening and speaking skills in the Spanish language. The course will help students deal with real everyday situations (identifying needs, shopping, seeking medical assistance, gathering information, etc.). The aim of the course is to enable students to understand basic spoken Spanish within the limits of the topics presented in the course, including (but not limited to) business, travel, and social interaction. This course is not open to students who have studied Spanish in high school for more than two semesters or to students who have native or near-native fluency in Spanish. 3 sem. hrs. 3 crs.

SPAN 115 GENERAL OBJECTIVES

The primary objective of this course is to enable students to communicate in Spanish orally and in writing. Using basic language functions such as socializing, providing and obtaining information, expressing feelings and opinions and convincing others to adopt a course of action, students will gain semantic and contextual understandings of how to speak Spanish. Further objectives of this course include but are not limited to reading comprehension and understanding of key grammatical structures.

The course is to be taught almost entirely in Spanish, and students are expected to use Spanish as their primary language of communication in the classroom. Accurate and intelligible pronunciation is fundamental to achieving this goal, and students will be corrected accordingly.

SPECIFIC OBJECTIVES

This course is specifically designed to allow students to develop the language skills needed for understanding, speaking, reading and writing in Spanish. An emphasis is placed on the acquisition of a practical vocabulary and oral use of the language as well as gaining fundamental tools for learning a foreign language. The basic
topics for conversation will include the following:

1. Greetings, farewells
2. Useful questions and answers, polite expressions
3. Daily activities, telephone calls, personal information

COMPETENCIES

Students who successfully complete this course will be able to orally and in writing:

1. Ask questions and respond to questions in a variety of contexts.
2. Express feelings and inquire about the feelings of others
3. Describe self and others

Sociology

SOCL 101 Introduction to Sociology

Introduction to the scientific study of human behavior as related to group membership. Major areas of study in sociology: basic structure of human society and of smaller groups; transmission of culture and regulation of behavior; acquisition of the social self; violation of norms; stratification by class, race, ethnicity, sex, and age; major social institutions; populations dynamics; and sociocultural change. 3 sem. hrs. 3 crs.

SOCL 101 General Learning Goals: The student who completes this course will have the following knowledge and abilities.

1. **To acquire an understanding of the sociological perspective**
2. **To understand the basic features of social science research**
3. **To understand: the discipline of Sociology and such key terminology as culture, socialization, social interaction, social structure, groups, deviance stratification, globalization, race, ethnicity, gender, age, social institutions, and social change.**

SOCL 101 Student Learning Objectives:

1. **Identify the basic features of social scientific research;**
2. **Be able to use a academic database to locate a peer reviewed research article**
3. **Compare and contrast sociology with other academic disciplines**
4. **Compare and contrast the role of values in sociological theory, research and practice**
5. **Recognize the relationships between sociological concepts and principles as they related to everyday living Describe the effect of gender, age, race, ethnicity, class on human behavior and experience**

Italian

ITAL 115 Italian for Communication

A beginning Italian course designed to help develop listening and speaking skills in the Italian language. The course will help students with real everyday situations (identifying needs, shopping, seeking medical assistance, gathering information, etc.). The aim of the course is to enable students to understand basic spoken Italian within the limits of the topics presented in the course, including (but not limited to) business, travel and social interaction. This course is not open to students who have studied Italian in high school for more than two semesters or to students who have native or near-native fluency in Italian. 3 sem. hrs. 3 crs.

Political Science

POLS 101 Political Power in America

The use of political science theory and method to investigate American political institutions: executives, legislature, judiciaries, bureaucracies, mass media, parties, interest groups, elites, and publics; comparisons with foreign political institutions, including their relationship to American institutions as manifested in foreign politics and international relations; the importance of political institutions, American and foreign, to the lives of students. 3 sem. hrs. 3 crs.

POLS 101 Student Learning Outcomes

a. Describe how knowledge from different cultural perspectives might affect interpretations of prominent problem in politics, society, the arts and/or global relations.
b. Evaluate the sources of his or her own perspectives on selected issues in culture, society, politics, the arts or global relations and compares that perspective with other views.
c. Identify a significant issue affecting at least two countries or continents
d. Justify a position on a public issue and relate this position to alternate views within the community/policy environment.

Psychology

PSYN 101 Introduction to Psychology

An introduction to the science of psychology, including a review of major historical perspectives, methods of research, and contemporary theory and knowledge. Major areas of study include the biological basis of behavior, emotion and motivation, learning and conditioning, human development, personality, and abnormal behavior. 3 sem. hrs. 3 crs.

PSYN 101 General Learning Goal:
The student should acquire a basic understanding of the nature and scope of modern psychology.

PSYN 101 Student Learning Objectives/Outcomes:
Upon completion of the class, students should be able to:

1. Discuss the basic concepts and terminology in each of the major areas of psychology.
2. Recognize several of the outstanding psychologists and to discuss their theories.
3. Understand different research techniques, their interpretation and ethical issues related to human and animal research.
4. Recognize and find a peer reviewed research study using academic databases, discuss the parts of the paper and know how to reference articles in APA format.
5. Demonstrate effective writing skills.
6. Apply psychological content and skills to careers goals.

AP Courses and the Mercy equivalent

(All AP courses must be approved by the College Board)

Courses that only receive 3 credits

(Courses generally are Yearlong but could also be offered for just 1 semester, Fall or Spring)

AP Environmental Science

BIOL 112 Environmental Science

A study of the basic biological concepts and scientific methodology as exemplified in the study of the present-day environmental problems such as air and water pollution, food control and population, and their effects on humans. 3 sem. hrs. 3 crs.

BIOL 112 Student Learning Outcomes

1. Become familiar with the urban environmental problems and possible solutions.
2. Enlighten students about cultural changes, worldviews, ethics and sustainability.
3. Empower students to think critically about environmental science through the use of scientific models and concepts.
4. Emphasize the interdisciplinary nature of environmental science.
5. Provide in-depth knowledge of matter and energy resources – types and concepts.
6. Analyze how ecosystems work and discuss the major types of ecosystems; the response of living systems to environment stress; population dynamics; evolution, adaptation and natural selection; and the impact of human activities on ecosystems.

AP Computer Science

CISC 131 (MATH 131) Foundations of Computing I

An introduction to the fundamental concepts of object-oriented programming, including classes, objects, and basic program control flow statements. Using the programming language, Java, students are introduced to principles of software design and reuse. *Prerequisites:* CISC/MATH 120 and MATH 116 or departmental approval. 2 sem. hrs. 2 hrs. lab. 3 crs.

CISC (MATH) 131 Student Learning Outcomes:

- Upon completion of the course, students will be able to:
- describe the interdisciplinary nature of computer science
- explain the fundamental principles and goals of software engineering and object-oriented programming

- explain the importance of the syntax and semantics of a programming language
- use all elementary constructs of the Python language
- use Python's basic graphic capabilities and graphical user interfaces
- systematically analyze a problem and design a simple algorithm from a specification
- translate an algorithm into the Python programming language
- use an Integrated Development Environment to write, edit, execute, and test Python programs

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AP Statistics

MATH 122 (ECON 122) Statistics

A survey of statistical material and techniques, with special reference to economic and business data. Methods of collecting, charting, and analyzing statistical data; frequency distributions; introduction to discrete probability; normal curve analysis; introduction to hypothesis testing and confidence intervals; linear regression and correlation; index numbers. *Prerequisites:* MATH 115 or 116, and CISC/MATH 120 and placement at the ENGL 109 level. 3 sem. hrs. 3 crs.

MATH 122 Student Learning Outcomes

Content: Students should be able to show competence in the terminology, concepts, methodologies and theories used within the statistics discipline.

Communication: Students should be able to discuss knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to statistics.

Critical Thinking: Students should be able to analyze information carefully and logically from multiple perspectives, using discipline specific methods and develop reasoned conclusions of studies.

AP Physics 1 & 2 (1st and 2nd year)

PHYS 160 Physics for the Life Sciences I

This is the first in a two-semester sequence of introductory physics with integrated laboratory. Algebra-based introduction to general physical principles in the areas of mechanics, energy, thermodynamics with conceptual and quantitative applications to phenomena in the life and health sciences. *Prerequisite:* MATH 201 or the equivalent. 3 hrs. lect. 3 hrs. lab . 4 crs.

PHYS 160 Student Learning Outcomes
Quantitative Reasoning

After completion of this course, students should be able to:

1. Express and analyze natural phenomena in quantitative terms that include an understanding of the natural prevalence of basic functional relationships
    - Proportional relationships
    - Linear relationships

- Quadratic relationships
- Inverse relationships
- Inverse square relationships
- Logarithmic/exponential relationships
- Periodic relationships

2. Use of units of measurable quantities; dimensional analysis and unit conversion
3. Identify functional relationships from visually represented data
    - Interpret physical meaning of graphical representations of data
        - Slope
        - Area under curve
        - Y-intercept
    - Describe graphical functional relationships in mathematical form
    - Draw and interpret visual display of vectors
        - Motion Diagrams
        - Free-body diagrams
        - Extended body diagrams
4. Modeling Functional Relationships
    - Be able to mathematically model pertinent aspects of a natural phenomenon in terms of functional relationships of measurable quantities
    - Make inferences about natural phenomena using mathematical models
    - Be able to articulate in words what relationships a mathematical model is expressing
    - Be able to discuss limitations of models, the simplifications and approximations made, and the temporal and spatial scale in which it is relevant.
5. Quantify and interpret changes in dynamical systems (How things change with time)
    - Kinematics
    - Biomechanical dynamics
        - 1D Linear dynamics
        - 2D linear dynamics
        - Rotational dynamics
    - Thermodynamics
    - Fluid dynamics

Scientific Inquiry

After completion of this course, students should be able to:

1. Demonstrate creative inquiry into the physical basis of natural phenomena
2. Demonstrate observational and interpretive skills
    - Hands-on activities in virtually every class
    - Bodies-on activities using kinesthetic sense

3. Operate basic laboratory instrumentation for scientific measurement or field experiences.
    - Computer-acquisition and analysis of data using:
      2D Force Plates, Force sensors, Motion sensors, 3 D accelerometers, goniometers, temperature sensors, pressure sensors, infrared sensors
    - Video analysis of visibly dynamic phenomena
4. Articulate reasoning to explain or question data.
5. Raise scientific questions, acquire and analyze data
    a. Guided inquiry during class
    - Student projects

Basic physical principles

After completion of this course, students should be able to:

1. Apply mechanics principles to living systems
    • Understand the interrelationships among work, energy, force, and acceleration.
        - How you move objects
        - How you get moved by objects (as a passenger)
        - How you move yourself (locomotion)

    • Understand the interrelationships among rotational work, rotational energy, torque, and angular acceleration
        - How engagement of your muscles moves your limbs

    • Apply knowledge of mechanics to movement in biological systems at various scales, from the molecular to the organismal.
        - How your limbs enable you to move objects and move yourself
        - How food energy is converted into muscular work

4. Apply principles of thermodynamics and fluid motion to functional properties of tissues and organisms. .
    - Heat transfer mechanisms and role of evaporation in the body
    - Entropy, life, and energy efficiency
    - Fluids and Pressures in the Body
    - Blood pressure and vascular blood flow
    - Lung pressures and breathing
    - Random Walks, Diffusion, and Osmosis
    - Effect of temperature on enzymes activity
    - Metabolic rate and caloric requirements

Synergy of principles in complex living systems

After completion of this course, students should be able to apply physical principles synergistically to topics in at least 3 of the following areas:

1. Apply physical principles to the function of cells, tissues, organs, and organisms.
    - Explain physical basis of functional properties of tissues and organs.

        - Elasticity/Injury of Body Tissues
        - Respiratory System
        - Circulatory System
    - Apply physics principles to biomechanics and exercise
        - Food energy conversion into muscular work
        - Gait analysis
        - Biomechanics to optimize sports technique
        - Exercise equipment design for optimal muscular engagement
        - Ergonomic considerations in human movement

2. Explain the physical basis of the mechanisms by which organisms sense and control their internal environment, sense and respond to their external environment.
    - Energy in bodily processes
    - Thermal regulation of the body
    - Vestibular apparatus - Balance
    - Cutaneous receptors and proprioceptors

3. Apply physical principles to the mechanisms of occupational and physical therapy modalities
    - Traction
    - Therapeutic heat and cold
    - Aquatics and hydrotherapy

4. Apply physics principles to biomedical and biophysics research techniques
    - Centrifuge

5. Apply physics principles to health field specializations
    - Dental
        - Chewing mechanics, TMJ
        - Tooth damage and repair
    - Veterinary
        - Distinctive animal locomotion and physiology
        - Extreme environment coping mechanisms

6. Apply physics principles to living on the earth, in the modern world
    - Climate effects, atmosphere, global warming, hurricanes, tornados
    - Shelter/clothes and temperature regulation
    - Transportation mechanics
        - Moving walkways, elevators
        - Surface vehicles
        - Air and water transport

PHYS 161 Physics for the Life Sciences II

This is the second in a two-semester sequence of algebra-based, introductory physics with integrated laboratory. The physical principles in the areas of fluids, oscillations, waves, magnetism, electricity, quantum and nuclear physics, with conceptual and quantitative applications to phenomena in the life and health sciences. *Prerequisites:* MATH 201 or the equivalent; PHYS 160. 3 hrs. lect. 3 hrs. lab, 4 crs.

PHYS 161
Quantitative Reasoning

After completion of this course, students should be able to:

2. Express and analyze natural phenomena in quantitative terms that include an understanding of the natural prevalence of basic functional relationships
    - Proportional relationships
    - Linear relationships
    - Quadratic relationships
    - Inverse relationships
    - Inverse square relationships
    - Logarithmic/exponential relationships
    - Periodic relationships
2. Use units of measurable quantities; dimensional analysis and unit conversion
3. Identify functional relationships from visually represented data
    - Interpret graphical representations of data
        - Physical meaning of
            - Slope
            - Area under curve
            - Y-intercept
        - Describe graphical functional relationships in mathematical form
        - Interpret frequency spectrums
    - Draw and interpret Visual display of
        - Vectors
        - Vector fields
            - Electric fields
            - Magnetic fields
4. Model
    - Be able to mathematically model pertinent aspects of a natural phenomenon in terms of functional relationships of measurable quantities
    - Make inferences about natural phenomena using mathematical models
    - Be able to articulate in words what relationships a mathematical model is expressing
    - Be able to discuss limitations of models, the simplifications and approximations made, and the temporal and spatial scale in which it is relevant.
5. Quantify and interpret changes in dynamical systems
    - Exponential functions
        - Damping

- Capacitance circuits
- Radioactive decay
- Attenuation/absorbtion

- Oscillations
  - Simple harmonic motion
    - Resonance
    - Damping
- Waves
- Electrical systems
- Electromagnetic Induction

Scientific Inquiry

After completion of this course, students should be able to:

6. Demonstrate creative inquiry into the physical basis of natural phenomena by asking questions and defining problems.
7. Demonstrate observational and interpretive skills
   - Hands-on activities in virtually every class
   - Articulate reasoning to explain or question data
8. Operate basic laboratory instrumentation for scientific measurement, interpretation, and analysis.
   - Computer-acquisition and analysis of data using:
     - temperature sensors,
     - pressure sensors,
     - sound sensors,
     - voltage and current sensors,
     - magnetic field sensors,
     - light, UV, and infrared sensors
     - Geiger counter sensor
   - Optics benches, multimeters, infrared camera
9. Search effectively, evaluate critically, and communicate analysis of scientific literature.
   - Literature search and review as part of student project.

Basic physical principles

After completion of this course, students should be able to:

1. Apply principles of electricity and magnetism to biological systems
   - Electrical forces, fields and potential:
     - Endogenous: cell membrane, action potentials, epithelial, intracellular
     - Electrocytes and electric field detection by fish
     - Electrostatic basis of chemical structure and function
     - Diagnostic – ECG, EMG, EEG
     - Therapeutic – Wound healing, electroporation, ionosphoresis, defribillation
   - Electric current and circuits

        - Nerve conduction
        - Resistivity/Impedance of bodily tissues, GRS, body fat composition
        - Electrical Safety: household and therapeutic
    - Magnetism and Electromagnetic induction
        - Diagnostic and therapeutic techniques using magnetism: MRI, bone repair
        - Endogenous magnetic fields of living systems
        - Magnetic sensing by animals
        - Electrical power generation
    - Electromagnetic waves
        - Natural and manmade sources and receivers at all scales of the EM spectrum

3. Apply physical principles of wave generation and propagation to application to living systems

- Matter Waves
    - Sound, Hearing, and Speech
    - Diagnostic and Therapeutic Ultrasound
- Electromagnetic Waves
    - Bodily effects at all scales in the electromagnetic spectrum
    - Diagnostic, therapeutic, and research uses at all scales in the spectrum
    - In everyday human use
- Geometric optics
    - Image formation in the eye and in microscopes
    - Fiber optics in medical scopes
- Wave optics
    - Image resolution in the eye and in microscopes
    - X-ray diffraction for biomolecular structure determination
    - Double slit and diffraction used for evidence of particle-wave duality

5. Apply principles of quantum mechanics and nuclear physics to the application to biological systems.

- Wave-particle duality as a basis for atomic and molecular energy levels and orbitals in biochemical structure and function,
- Quantum basis of biomedical investigative tool: spectroscopy, lasers, MRI
- Atomic/molecular energy levels and the origin of light and ionizing radiation
- Interaction of exogenous electromagnetic radiation with atoms and molecules of living systems in all scales of spectrum.
- Radioactivity: isotopes as biological tracers
- Biological effects of nuclear radiation
- Nuclear fission and fusion for educated citizenship

Synergy of principles in complex living systems

After completion of this course, students should be able to apply physical principles synergistically to topics in at least 4 of the following areas:

7. Apply principles of electrostatics, quantum mechanics, and thermodynamics to biochemical processes. *Examples:*
    - Ionic and covalent bonding, Van der Waals interactions, hydrogen bonding
    - Hydrophobicity and hydrophilicity driving molecular association.
    - Structure of biological macromolecules and the effect of structure on properties.
    - Biosynthesis: DNA, RNA transcription, self assembly, protein folding
    - Energy storage in fatty acids and ATP and the transduction to functional activity
    - Spontaneity of biochemical processes

8. Apply physical principles to the function of cells, tissues, organs, and organisms. *Examples:*
    - Physical mechanisms of cellular function:
        - Energy conversion and metabolism
        - Membrane structure and function
        - Cell transport and storage
        - Molecular motors, muscle contraction and cell motility
    - Physical mechanisms of functional properties of tissues and organs.
        - Nervous system
        - Respiratory system
        - Circulatory system

9. Explain the physical basis of the mechanisms by which organisms sense and control their internal environment, sense and respond to their external environment. *Examples:*
    - Energy in bodily processes
    - Homeostasis, feedback
    - Reception and transduction of receptor signals
    - Eyes and Vision
    - Ears and Hearing
    - Signaling: inter- and intracellular communication

10. Explain the physical basis of possible mechanisms of occupational and physical therapy modalities. *Examples:*
    - Electrical Stimulation – biofeedback, repatterning, muscular strengthening, tissue repair, pain management, wound healing
    - Therapeutic ultrasound
    - Laser light therapy
    - Transdermal drug delivery (ionphoresis and phonophoresis)
    - Vibration/Rhythm (rocking, swinging, vibration plate)

11. Apply physics principles to medical treatment and diagnostic tools. *Examples:*
- Imaging (ultrasound, x-rays, Cat scan, MRI, infrared, radioactive tracers, PET)
- Surgical or tumor destruction (cauterization, laser, gamma knife, electroporation)
- Nuclear medicine
- Function replacement (heart, limb, joint)
- Electrical (ECG, EMG, EEG, GRS, nerve conduction)

12. Apply physics principles to biomedical and biophysics research techniques. *Examples:*
- Electrophoresis, chromatography, DNA analysis
- Voltage dyes, ion patch clamp
- Fluorescence microscopy
- Atomic force microscopy
- Optical tweezers
- Spectroscopy

13. Apply physics principles to health field specializations. *Examples:*
- Dental
  - Decay detection
  - Ultrasonic cleaning
- Veterinary
  - Distinctive animal communication
  - Distinctive sensing; prey detection, magnetic sensing

14. Apply physics principles to living on the earth, in the modern world. *Examples:*
- Earthquakes
- Electromagnetic effects: Lightning, magnetic storms, man-made electromagnetic fields, polar auroras, earth's magnetic and electric fields
- Electrical appliances and computer devices
- Communication

15. Apply physics principles to consider possible mechanisms for alternative and complementary wellness approaches. *Examples:*
- Acupuncture
- Bodywork (massage, cranial sacral, chiropractic, reflexology, structural integration, applied kinesiology, Reiki, therapeupic touch, dance)
- Somatic techniques (yoga, qiqong, tai chi, Gyrotonic, Alexander, Feldenkrais, Pilates)
- Mind/Body (visualization, prayer, hypnosis, meditation, humor/laughter, placebo effect)
- Sound (music therapy, bi-aural entrainment, chanting)
- Electromagnetic (magnets, bio-field imaging, electrodermal testing, bioresonance, earth grounding)
- Light (full spectrum, laser, color)

- Accredited alternative health disciplines (naturopathy, osteopathy, oriental medicine)
- Others (homeopathy, iridology, aromatherapy, crystal healing, flower essences)

AP Psychology

PSYN 101 Introduction to Psychology

An introduction to the science of psychology, including a review of major historical perspectives, methods of research, and contemporary theory and knowledge. Major areas of study include the biological basis of behavior, emotion and motivation, learning and conditioning, human development, personality, and abnormal behavior. 3 sem. hrs. 3 crs.

PSYN 101 Student Learning Objectives/Outcomes:

Upon completion of the class, students should be able to:

1. Discuss the basic concepts and terminology in each of the major areas of psychology.
2. Recognize several of the outstanding psychologists and to discuss their theories.
3. Understand different research techniques, their interpretation and ethical issues related to human and animal research.
4. Recognize and find a peer reviewed research study using academic databases, discuss the parts of the paper and know how to reference articles in APA format.
5. Demonstrate effective writing skills.
6. Apply psychological content and skills to careers goals.

AP Government and Politics

POLS 101 Political Power in America

The use of political science theory and method to investigate American political institutions: executives, legislature, judiciaries, bureaucracies, mass media, parties, interest groups, elites, and publics; comparisons with foreign political institutions, including their relationship to American institutions as manifested in foreign politics and international relations; the importance of political institutions, American and foreign, to the lives of students. 3 sem. hrs. 3 crs.

POLS Student Learning Outcomes

a. Describe how knowledge from different cultural perspectives might affect interpretations of prominent problem in politics, society, the arts and/or global relations.

b. Evaluate the sources of his or her own perspectives on selected issues in culture, society, politics, the arts or global relations and compares that perspective with other views.

c. Identify a significant issue affecting at least two countries or continents

d. Justify a position on a public issue and relate this position to alternate views within the community/policy environment.

Courses that may receive up to 6 or 8 credits depending on lab component.

(Courses are Yearlong with 2 term registrations, Fall and Spring)

AP Biology (Must meet the criteria for both BIOL 160 & 161)

BIOL 160 General Biology I Lecture

This course is an introduction to contemporary biology, covering the chemical basis of biology, cell structure and function, cell division, genetics, and basic molecular biology. *Prerequisite:* Placement at MATH 116 level and ENGL 110 or the equivalent. 3 hrs. lect., 3 hrs. lab. 4 cr.

BIOL 160A General Biology I Laboratory

This laboratory course is designed to complement concepts taught in the BIOL 160 lecture course. Students will gain proficiency in light microscopy, spectrometry, pipetting and experimentation. This course also has a recitation session devoted to advanced genetic problems. *Prerequisite:* Placement at MATH 116 level and ENGL 110 or the equivalent. 3 hrs. lab. 1 crs.

BIOL 160 Student Learning Outcomes

1. Students will be able to describe the chemical organization of the cell and its relationship to cellular functions, especially in metabolic operations, energy manipulations, and inheritance.
2. Students will know about the structural organization of the cell and the relationship to cellular diversity.
3. Students will be able to describe the function and significance of cell membranes.
4. Students will be able to describe the metabolic pathways of cellular respiration and photosynthesis and the relationship to cellular operations.
5. Students will understand how the cell divides, sexual reproduction, and the concept of inheritance.
6. Students will know the importance of nucleic acids in determining cellular properties, cellular operations, and mechanisms of inheritance.
7. Students will be able to describe the structure and function of the gene and its control over protein synthesis.
8. Students will understand how genes regulate cellular and organismal function.

BIOL 161 General Biology II Lecture

A study of the structure and function of living organisms with primary emphasis on multicellular organisms and their interactions. *Prerequisite:* BIOL 160. 3 hrs. lect., 3 hrs. lab. 3 crs.

BIOL 161A General Biology II Laboratory

This laboratory course is designed to complement concepts taught in the BIOL 161 lecture course. Corequisite: BIOL 161. *rperequisites:* BIOL 160/160A. 3 hrs. lab. 1 crs.

BIOL 161 Student Learning Outcomes

1. Students will be able to identify and classify a wide range of organisms from each kingdom of life.
2. Students will be able to identify the structure, function and interaction of the major organ systems of mammals.

AP Chemistry (Must meet the criteria for both CHEM 160 & 161)

CHEM 160 General Chemistry I Lecture

A systematic development of the fundamental laws and theories of modern chemistry and the application of these principles to the chemistry of the elements and their compounds. Topics include: atomic structure, the periodic table and properties of elements, chemical bonding, stoichiometric relationships, thermochemistry, and states of matter. *Prerequisites:* MATH 116 with a grade of C or higher. Corequisite: CHEM 160A.

CHEM 160A General Chemistry Laboratory

The laboratory introduces basic synthetic and analytical techniques, including gravimetric analysis, qualitative analysis, small-scale calorimetry, and the use of computers for data collection and analysis. *Prerequisites:* MATH 116 . with a grade of C or higher. Corequisite: CHEM 160. 3 hrs. lab. 1 crs.

CHEM 160 Student Learning Outcomes

1. Categorize matter by physical state and chemical composition; perform density calculations.
2. Distinguish between physical and chemical changes in matter.
3. Explain the difference between atoms, molecules, and ions; describe the properties of the basic subatomic particles, perform calculations using atomic number, mass number, and atomic mass.
4. Determine atomic mass from isotopic masses and fractional abundance.
5. Use the periodic table to predict properties of elements and the compounds they form.
6. Correctly write formulas for compounds and name compounds (including binary & ternary acids and hydrates); differentiate between ionic and covalent compounds.
7. Convert amongst grams, atoms, and moles; calculate molar mass of a compound and mass percent composition.
8. Determine the empirical formula of a compound from its mass percentage composition. Determine molecular formulas from empirical formulas.
9. Balance chemical equations; perform stoichiometric calculations; calculate the limiting reactant.
10. Classify chemical reactions as synthesis, decomposition, single displacement, or double displacement.
11. Use solubility rules to predict the solubility of compounds in water; write net ionic equations and identify spectator ions.
12. Write equations for precipitation, acid-base, gas evolution, oxidation-reduction, or combustion reactions.
13. Calculate the oxidation number of an element in a compound; identify which element is oxidized and which is reduced in a reaction.
14. Distinguish between dilute and concentrated solutions.
15. Use molarity as a measurement of concentration; interconvert molarity, moles, and volume, perform calculations involving dilution of solutions.
16. Distinguish between kinetic and potential energy, and between energy and enthalpy.
17. Distinguish between heat and temperature; perform calorimetry calculations using specific heat.
18. Determine whether a reaction is endothermic or exothermic from its heat of reaction.

19. Distinguish between enthalpy and entropy; write and manipulate thermochemical equations.
20. Determine heats of reaction (ΔH) from calorimetric data; apply Hess's Law to calculate ΔH.
21. Convert between wavelength and frequency of light; calculate the energy of a photon.
22. Determine the wavelength or frequency of a hydrogen atom transition.
23. Use the de Broglie equation to determine the wavelength associated with a particle.
24. Distinguish between sets of quantum numbers that are permissible and not permissible; describe properties of the atomic orbitals.
25. Use the Aufbau Principle, its exceptions, the Pauli Exclusion Principle, and the periodic table to write and recognize correct electron configurations of atoms and ions.
26. Use Hund's Rule to write orbital diagrams and predict magnetic properties of atoms.
27. Use the periodic table to predict trends in the following properties: atomic radius, ionic radius, ionization energy, electron affinity, and electronegativity.
28. Write Lewis structures of atoms, molecular compounds, polyatomic ions, and resonance structures. Distinguish between the properties of ionic, covalent, and polar covalent bonds.
29. Determine relative lattice energies, formal charges, bond lengths, and bond energies.
30. Use the VSEPR Model and Valence Bond (hybrid orbital) Theory to determine the geometry of molecules; determine the effect of lone electron pairs on bond angle; relate dipole moment to molecular geometry; describe multiple bonding in terms of sigma and pi bonds.
31. Use the kinetic molecular theory to explain properties of gases; solve problems using Boyle's, Charles's, Avogadro's, Dalton's, Graham's laws the ideal gas law, and the van der Waals equation.
32. Determine the molecular weight of a gas from its density; calculate the mass of a gas collected over water.
33. Apply their knowledge of chemical concepts to explain biological phenomena.

CHEM 161 General Chemistry II Lecture

This course is a continuation of general chemistry I and is designed to provide students an understanding of solutions, acids and bases, thermodynamics, electrochemistry, and kinetics. *Prerequisites:* CHEM 160/160A. Corequisite: CHEM 161A. 3 hrs. lect. 3 crs.

CHEM 161A General Chemistry II Laboratory

The laboratory emphasizes analytical techniques associated with lecture topics. Computers are used in laboratories for data collection and analysis. *Prerequisites:* CHEM 160/160A. Corequisite: CHEM 161. 3 hrs. lab. 1 crs.

CHEM 161

1. Use the kinetic molecular theory to explain properties of liquids and solids, vapor pressure, and boiling; calculate the heat required for a phase change; calculate vapor pressure at a given temperature; interpret phase diagrams.
2. Identify the relevant intermolecular force operating between molecules; relate type of bonding and intermolecular forces to properties of liquids and solids.
3. Perform calculations involving molarity and volumetric analysis; describe factors affecting solubility of substances; solve problems using Henry's Law and colligative properties.

4. Calculate reaction rates, order of a reaction, and the half-life of a reaction from experimental data.
5. Apply Collision Theory to explain the factors affecting reaction rates and interpret potential energy diagrams. Use the Arrhenius equation to determine the effect of temperature on rate.
6. Relate the reaction mechanism to the rate law.
7. Calculate equilibrium constants from the reaction composition; use the equilibrium constant to predict the direction of a reaction and the equilibrium concentrations of substances.
8. Apply Le Chatelier's Principle to predict the response of a system at equilibrium to a change in condition.
9. Use the Arrhenius, Bronsted-Lowry, and Lewis definitions of acids and bases to explain their properties.
10. Distinguish between weak and strong acids, dilute and concentrated solutions; relate acid strength to molecular structure.
11. Calculate pH of a solution from its hydrogen ion concentration or from its equilibrium constant, K_a or K_b.
12. Classify a solution as acidic, basic, or neutral based on its pH; classify a salt solution as acidic, basic, or neutral based on the composition of the salt.
13. Perform calculations involving the common ion effect, buffers, titration, and complex ion equilibria.
14. Apply the three laws of thermodynamics to chemical reactions; use the Gibbs Free Energy equation to predict the spontaneous direction of a chemical reaction.
15. Calculate the heat of reaction, entropy change, and enthalpy change for a reaction.
16. Relate the Gibbs Free Energy Change to the equilibrium constant for a reaction; determine the non-standard free energy change for a reaction.
17. Write half-reactions for oxidation and reduction; identify oxidizing and reducing reagents in a reaction. Determine the oxidation state of an element in a compound or polyatomic ion.
18. Balance equations for oxidation-reduction reactions.
19. Calculate standard electrode potentials and use them to determine the spontaneous direction of a redox reaction and the equilibrium constant. Determine non-standard electrode potentials.
20. Analyze an equation for an electrolytic cell. Write the equations for the reactions at the anode and cathode. Perform stoichiometry calculations related to electrolysis.
21. Predict a product or reactant in a nuclear reaction; write equations for nuclear reactions; predict the category of radioactive decay that a radioactive nuclide will undergo.
22. Perform calculations involving half-life and radioactive dating.
23. Describe the use of radioactive isotopes in medical therapy and diagnostic imaging procedures.
24. Apply their knowledge of chemical concepts to explain biological phenomena.

AP English *(Language & Composition) or (Literature and Composition)*

ENGL 111 Written English and Literary Studies I

Introduction to elements of expository writing and research methods through the study of literary texts (nonfiction genre). Students read and examine these texts in order to formulate essays in several rhetorical modes. Placement determined by the English placement policy. 3 sem. hrs. 3 crs.

Course Goals:

11) To introduce students to literary essays and the rhetorical situations within them
12) To understand and practice the writing process, which includes reading, pre-writing, drafting, writing, editing, and revising
13) To write in several rhetorical modes using the prose, analytical, and organizational strategies associated with each
14) To develop students' critical thinking and reading skills
15) To recognize and develop elements of grammar, punctuation, style, and MLA documentation

Student Learning Outcomes:

By the completion of the course, students should be able to:

4) use close reading strategies to fuel analytical discussions of literary texts
5) write clear, coherent essays in several rhetorical modes
6) recognize and adhere to conventions of grammar and MLA style

demonstrate basic skills necessary for a research paper, such as quoting and paraphrasing and using parenthetical citation

ENGL 112 Written English and Literary Studies II

Students read and critically analyze literary works (fiction and/or drama). Students compose a full-length research essay based on assigned topics. *Prerequisite*: ENGL 111. 3 sem. hrs. 3 crs.

AP French

FREN 115 French for Communication

A beginning French course designed to help develop listening and speaking skills in the French language. The course will help students deal with real everyday situations (identifying needs, shopping, seeking medical assistance, gathering information, etc.). The aim of the course is to enable students to understand basic spoken French within the limits of the topics presented in the course, including (but not limited to) business, travel, and social interaction. This course is not open to students who have studied French in high school for more than two semesters or to students who have native or near-native fluency in French. 3 sem. hrs. 3 crs.

FREN 116 Communicating in French

This course is a continuation of French 115 and is designed to further the progress made by students who will continue to learn the basic elements of French structure and vocabulary necessary for an ability in this language. The main emphasis of the course is on speaking and understanding French as it is spoken today in France and in over thirty countries throughout the world. Prerequisite: FREN 115 or the equivalent; two years of high school French; or approval of the Language program director. Please note that candidates for New York State Teacher Certification and Mercy College English Literature majors must take two courses (six credits) in a second language. These two courses must be in the same second language. 3 sem. hrs. 3 crs.

AP European History

HIST 101 European History to 1500

An overview of European history from antiquity to 1500: the rise and fall of Greece and Rome; the Middle Ages; the Italian and Northern Renaissance; the beginning of the Reformation. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 101 STUDENT LEARNING OUTCOMES:

- Students should be abler to demonstrate proficiency in critical reading and thinking by providing written evaluations of texts. Primary and secondary texts.
- Students should be abler to demonstrate proficiency in critical reading and thinking by providing written evaluations of texts.
- Students should be able to demonstrate historical knowledge of various and specific time periods and geographic regions through quizzes, exams, oral, and written assignments.
- Students should be able to demonstrate understanding of historical methods, analytical skills, and critical writing in forms of in-class assignments and assigned essays.
- Students should be able to demonstrate improved writing skills and show proficiency in appropriate grammar and syntax. Students must also be able to evaluate primary and secondary sources through an array of writing and oral assignments.

HIST 102 European History Since 1500

An overview from the Reformation to the present: Luther, Calvin, the Counter Reformation; the Age of Discovery; absolutism and parliamentarianism; the Scientific Revolution and the Enlightenment; the French Revolution and the Napoleonic Era; the development of political and economic ideologies; World War I; the Russian Revolution; the emergence of Fascism and Totalitarianism; World War II and its aftermath. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 102 STUDENT LEARNING OUTCOMES:

- Students should be able to understand and recognize critical analysis of primary and secondary sources.
- Students should be able to critically read and provide written responses in European history.
- Students should be able to understand change over time within a historical context with respect to social, religious, political, economic, and/or technological forces among the various societies.
- Students should be able to analyze cause and effect relationships while demonstrating a sense of historical time.

AP US History

HIST 105 American History through 1877

A general survey from the Age of first contact through the end of Reconstruction, covering such major developments as the emergence and growth of the 13 colonies; the founding and organization of the nation state; changing political, social, and economic patterns; and the origins and impact of the Civil War. Extensive map work is required 3 sem. hrs. 3 crs.

HIST 105 Learning Objectives of this course are to:

1. Improve the quality of the student's mind so that at the end of the term he/she will think, speak and write more logically, critically and effectively.
2. Give students a basic introduction to the study of history and its implications for the present and future.
3. Survey major political, social and economic trends, giving attention to the individual, institutions and cultural transformation that have shaped the American history.
4. Eliminate the fallacies and oversimplification with which students are likely to view the American past, substituting analysis and a more complex picture.

HIST 106 American History Since 1877

A general survey from the end of Reconstruction to the recent past. Major themes will be the development of American domestic politics; the nation's emergence as a world power; changes in American society, economy, and culture; and the influence of past events on contemporary life. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 106 STUDENT LEARNING OUTCOMES:

- Students should be able to understand and recognize critical analysis of primary and secondary sources.
- Students should be able to critically read and provide written responses in American history.
- Students should be able to understand change over time within a historical context with respect to social, religious, political, economic, and/or technological forces among the various societies.

- Students should be able to analyze cause and effect relationships while demonstrating a sense of historical time

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AP World History

HIST 101 European History to 1500

An overview of European history from antiquity to 1500: the rise and fall of Greece and Rome; the Middle Ages; the Italian and Northern Renaissance; the beginning of the Reformation. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 101 STUDENT LEARNING OUTCOMES:

- Students should be abler to demonstrate proficiency in critical reading and thinking by providing written evaluations of texts. Primary and secondary texts.
- Students should be abler to demonstrate proficiency in critical reading and thinking by providing written evaluations of texts.
- Students should be able to demonstrate historical knowledge of various and specific time periods and geographic regions through quizzes, exams, oral, and written assignments.
- Students should be able to demonstrate understanding of historical methods, analytical skills, and critical writing in forms of in-class assignments and assigned essays.
- Students should be able to demonstrate improved writing skills and show proficiency in appropriate grammar and syntax. Students must also be able to evaluate primary and secondary sources through an array of writing and oral assignments.

HIST 106 American History Since 1877

A general survey from the end of Reconstruction to the recent past. Major themes will be the development of American domestic politics; the nation's emergence as a world power; changes in American society, economy, and culture; and the influence of past events on contemporary life. Extensive map work is required. 3 sem. hrs. 3 crs.

HIST 106 STUDENT LEARNING OUTCOMES:

- Students should be able to understand and recognize critical analysis of primary and secondary sources.
- Students should be able to critically read and provide written responses in American history.
- Students should be able to understand change over time within a historical context with respect to social, religious, political, economic, and/or technological forces among the various societies.

- Students should be able to analyze cause and effect relationships while demonstrating a sense of historical time

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AP Italian

ITAL 115 Italian for Communication

A beginning Italian course designed to help develop listening and speaking skills in the Italian language. The course will help students with real everyday situations (identifying needs, shopping, seeking medical assistance, gathering information, etc.). The aim of the course is to enable students to understand basic spoken Italian within the limits of the topics presented in the course, including (but not limited to) business, travel and social interaction. This course is not open to students who have studied Italian in high school for more than two semesters or to students who have native or near-native fluency in Italian. 3 sem. hrs. 3 crs.

ITAL 115 COURSE OUTCOMES:

By the end of this course, students will gain the skills needed for understanding, speaking, reading, and writing in Italian. An emphasis is placed on the acquisition of a practical vocabulary and oral use of the language as well as gaining fundamental tools for learning a foreign language. The basic topics for conversation will include the following:

1. Greetings, farewells, personal data
2. Daily activities of self and others, telephone calls, nationalities
3. Characteristics of people and things
4. Food, beverage, and party activities
5. Travel, leisure, and friends
6. Descriptions of family members, weather, seasons, holidays

ITAL 115 COMPETENCIES

Students who successfully complete this course will be able to orally and in writing:

1. ask questions
2. respond to questions
3. express feelings and inquire about the feelings of others
4. ask for prices and bargain for a favorable deal
5. describe self and others
6. express and describe actions in the present and future
7. express needs when traveling and asking for directions

ITAL 116 Communicating in Italian

This course is a continuation of Italian 115 and is designed to further the progress made by students in developing basic communication skills in Italian. Students will continue to learn the basic elements of Italian structure and vocabulary necessary for an ability to communicate in this language. A large emphasis of the course is on speaking and understanding Italian as

it is spoken today in Italy and in other parts of the world. Prerequisite: ITAL 115 or the equivalent; two years of high school Italian; or approval of the Language program director. Please note that candidates for New York State Teacher Certification and Mercy College English Literature majors must take two courses (six credits) in a second language. These two courses must be in the same second language. 3 sem. hrs. 3 crs.

COURSE OUTCOMES

By the end of this course, students will have developed an intermediate level in the language skills of listening, speaking, reading, and writing with emphasis placed on a practical vocabulary and oral use of the language. The basic topics for conversation will include the following:

1. Greetings, farewells, personal data
2. Daily activities of self and others, telephone calls, nationalities
3. Characteristics of people and things
4. Food, beverage, and party activities
5. Travel, leisure, and friends
6. Descriptions of family members, weather, seasons, holidays

COMPETENCIES

Students who successfully complete this course will be able to orally and in writing:

1. ask questions
2. respond to questions
3. express feelings and inquire about the feelings of others
4. persuade others and tell others what to do
5. describe self and others
6. express and describe actions in the past and in the subjunctive mode
7. express needs when traveling and asking for directions

AP Calculus AB

MATH 201 Precalculus

An introduction to real-valued functions and their graphs including polynomial, rational, exponential, logarithmic, and trigonometric functions. Functions will be represented symbolically, numerically, graphically, and verbally. Real-world applications will be used to introduce the concepts. Graphing calculators will be used throughout the course. *Prerequisite:* MATH 116 or a minimum grade of B in high school intermediate algebra. 2 sem. hrs. 2 hrs. lab, 3 crs.

MATH 201 Learning Outcomes

1. Students will know how to read and interpret graphs of linear, quadratic, polynomial, exponential, logarithmic and trigonometric functions that will support success with other outcomes.
2. Students will raise their comfort level when approaching a multi-step mathematical problem.
3. Students will be prepared to tackle the challenges of higher mathematics and computer science.
4. Students will know how to set up and solve word problems involving linear, quadratic, exponential, logarithmic and trigonometric equations.

MATH 260 Calculus I

A review of elementary functions using numerical, graphical and algebraic techniques; limits; derivative and its definition; interpretation of derivatives and their application to problems of optimization. Particular emphasis is given to the use of technology to understand the concepts and to solve real-world problems. *Prerequisite:* MATH 201 or the equivalent. 4 sem. hrs. 4 crs. (Offered in fall and summer semesters.)

MATH 260 Learning Outcomes

Upon completion of the course, students will be able to:

1. Interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modeled by the function.
2. Verify the value of the limit of a function at a point using the definition of the limit.
3. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques including L'Hospital's rule.
4. Find points of discontinuity for functions and classify them.
5. Interpret the derivative of a function at a point the as the instantaneous rate of change in the quantity modeled and state its units.
6. Interpret the derivative of a function at a point as the slope of the tangent line and estimate its value from the graph of a function
7. Sketch the graph of the derivative from the given graph of a function.
8. Compute the value of the derivative at a point algebraically using the (limit) definition
9. Derive the expression for the derivative of elementary functions from the (limit) definition.
10. Show whether a function is differentiable at a point.
11. Compute the expression for the line tangent to a function at a point
12. Compute the expression for the derivative of a function using the rules of differentiation including the power rule, product rule, and quotient rule and chain rule.
13. Compute the expression for the derivative of a composite function using the chain rule of differentiation.
14. Differentiate a relation implicitly and compute the line tangent to its graph at a point.
15. Differentiate exponential, logarithmic, and trigonometric and inverse trigonometric functions.
16. Obtain expressions for higher order derivatives of a function using the rules of differentiation.
17. Interpret the value of the first and second derivative as measures of increase and concavity of functions.
18. Compute the critical points of a function on an interval.
19. Identify the extrema of a function on an interval and classify them as minima, maxima or saddles using the first derivative test.

AP Calculus BC

MATH 260 Calculus I

A review of elementary functions using numerical, graphical and algebraic techniques; limits; derivative and its definition; interpretation of derivatives and their application to problems of optimization. Particular emphasis is given to the use of technology to understand the concepts and to

solve real-world problems. *Prerequisite:* MATH 201 or the equivalent. 4 sem. hrs. 4 crs. (Offered in fall and summer semesters.)

MATH 260 Learning Outcomes
Upon completion of the course, students will be able to:

1. Interpret a function from an algebraic, numerical, graphical and verbal perspective and extract information relevant to the phenomenon modeled by the function.
2. Verify the value of the limit of a function at a point using the definition of the limit.
3. Calculate the limit of a function at a point numerically and algebraically using appropriate techniques including L'Hospital's rule.
4. Find points of discontinuity for functions and classify them.
5. Interpret the derivative of a function at a point the as the instantaneous rate of change in the quantity modeled and state its units.
6. Interpret the derivative of a function at a point as the slope of the tangent line and estimate its value from the graph of a function
7. Sketch the graph of the derivative from the given graph of a function.
8. Compute the value of the derivative at a point algebraically using the (limit) definition
9. Derive the expression for the derivative of elementary functions from the (limit) definition.
10. Show whether a function is differentiable at a point.
11. Compute the expression for the line tangent to a function at a point
12. Compute the expression for the derivative of a function using the rules of differentiation including the power rule, product rule, and quotient rule and chain rule.
13. Compute the expression for the derivative of a composite function using the chain rule of differentiation.
14. Differentiate a relation implicitly and compute the line tangent to its graph at a point.
15. Differentiate exponential, logarithmic, and trigonometric and inverse trigonometric functions.
16. Obtain expressions for higher order derivatives of a function using the rules of differentiation.
17. Interpret the value of the first and second derivative as measures of increase and concavity of functions.
18. Compute the critical points of a function on an interval.
19. Identify the extrema of a function on an interval and classify them as minima, maxima or saddles using the first derivative test.

MATH 261 Calculus II

The definite integral, its definition and interpretation; antiderivatives; The Fundamental Theorem of Calculus; techniques of integration; numerical methods; improper integrals; applications of the integral to problems to real-world problems; a brief introduction to ordinary differential equations. *Prerequisite:* MATH 260 4 sem. hrs. 4 crs. (Offered in spring semester.)

MATH 261 LEARNING OUTCOMES:

Upon completion of the course, the student will be able to:
1. Define standard integral objects.

2. Develop integration techniques.

3. Develop numerical integration techniques.
4. Explore various applications of the integral.
5. Solve definite and indefinite integrals
6. Solve application problems.
7. Interpret the area enclosed between curves as a definite integral and compute its value.
8. Set up the Riemann sum representing the volume enclosed by a geometric solid, convert the result to a definite integral and compute its value.
9. Interpret a volume of revolution of a function's graph around a given axis as a sum of disks or cylindrical shells, convert to definite integral form and compute its value.
10. Express the length of a curve as a (Riemann) sum of linear segments, convert to definite integral form and compute its value.
11. Express the surface area of revolution of a function's graph around a given axis as a (Riemann) sum of rings, convert to definite integral form and compute its value.
12. Anti-differentiate products of functions by parts.
13. Recognize and implement appropriate techniques to anti-differentiate products of trigonometric functions.
14. Devise and apply a trigonometric substitution in integrals involving Pythagorean quotients.
15. Decompose a rational integrand using partial fractions.
16. Determine convergence of improper integrals with discontinuities in their domain or infinite limits of integration.
17. Apply basic anti-differentiation techniques to selected problems arising in various fields such as physical modeling , economics and population dynamics.

AP Spanish

SPAN 115 Spanish for Communication

A beginning Spanish course designed to help develop listening and speaking skills in the Spanish language. The course will help students deal with real everyday situations (identifying needs, shopping, seeking medical assistance, gathering information, etc.). The aim of the course is to enable students to understand basic spoken Spanish within the limits of the topics presented in the course, including (but not limited to) business, travel, and social interaction. This course is not open to students who have studied Spanish in high school for more than two semesters or to students who have native or near-native fluency in Spanish. 3 sem. hrs. 3 crs.

SPAN 115 GENERAL OBJECTIVES

The primary objective of this course is to enable students to communicate in Spanish orally and in writing. Using basic language functions such as socializing, providing and obtaining information, expressing feelings and opinions and convincing others to adopt a course of action, students will gain semantic and contextual understandings of how to speak Spanish. Further objectives of this course include but are not limited to reading comprehension and understanding of key grammatical structures.
The course is to be taught almost entirely in Spanish, and students are expected to use Spanish as their primary language of communication in the classroom. Accurate and intelligible pronunciation is fundamental to achieving this goal, and students will be corrected accordingly.

SPECIFIC OBJECTIVES

This course is specifically designed to allow students to develop the language skills needed for understanding, speaking, reading and writing in Spanish. An emphasis is placed on the acquisition of a practical vocabulary and oral use of the language as well as gaining fundamental tools for learning a foreign language. The basic
topics for conversation will include the following:

1. Greetings, farewells
2. Useful questions and answers, polite expressions
3. Daily activities, telephone calls, personal information

COMPETENCIES

Students who successfully complete this course will be able to orally and in writing:

1. Ask questions and respond to questions in a variety of contexts.
2. Express feelings and inquire about the feelings of others
3. Describe self and others

SPAN 116 Communicating in Spanish

This course is a continuation of Spanish 115 and is designed to further the progress made by students in developing basic communication skills in Spanish. Students will continue to learn the basic elements of Spanish structure and vocabulary necessary for an ability to communicate in this language. A large emphasis of the course is on speaking and understanding Spanish as it is spoken today in twenty countries in Europe and in the Americas. *Prerequisite:* SPAN 115 or the equivalent; two years of high school Spanish; or approval of the Language program director. 3 sem. hrs. 3 crs.

COURSE OUTCOMES:

By the end of this course, students will have developed an intermediate level of language skills in listening, speaking, reading, and writing with emphasis placed on a practical vocabulary and oral use of the language. The basic topics for conversation will include the following:

7. Greetings, farewells, personal data
8. Daily activities of self and others, telephone calls, nationalities
9. Characteristics of people and things
10. Food, beverage, and party activities
11. Travel, leisure, and friends
12. Descriptions of family members, weather, seasons, holidays

COMPETENCIES

Students who successfully complete this course will be able to orally and in writing:

8. ask questions
9. respond to questions
10. express feelings and inquire about the feelings of others
11. persuade others and tell others what to do
12. describe self and others
13. express and describe actions in the past and in the subjunctive mode
14. express needs when traveling and asking for directions