any of the following fields: American History, European History, World History, or the History of Science/Agriculture/Technology. This tutorial approach culminates in the preparation of a paper of considerable length with an oral defense/presentation. 3 hours Lecture — 3 credits.

LA 4127
United States Foreign Policy
The history of American foreign relations concerns power, profit, security, politics, and ideology. This offering of US diplomatic history, covering selected topics from 1775 to the present, will explore competing interpretations of America’s hot and cold wars, periods of peace, isolation, and intervention. 3 hours Lecture and Discussion — 3 credits.

LA 4203
Social Psychology and Human Interaction
The scientific study of how people interact, communicate, influence, interpret and relate to one another. The course focuses on the way an individual relates to groups as well as how various groups affect the individual. Topics include prejudice, groupthink, attitude inoculation, polarization, eyewitness testimony, altruism, aggression, bargaining, mediation, arbitration, and conciliation. Prerequisite: Introduction to Psychology. 3 hours Lecture and Discussion — 3 credits.

LA 4224
Cultural Minorities
The social institutions of selected racial, ethnic and religious minorities, as well as the institutional, demographic and social/psychological aspects of intergroup relations, are reviewed. Prerequisite: Introduction to Sociology. 3 hours Lecture and Discussion — 3 credits.

LA 4228
The American Family
This course traces a history and background of American family patterns that includes the structure, functions, and values of the contemporary family. It also deals with the factors that may result in the disorganization of the family. 3 hours Lecture and Discussion — 3 credits.

LA 4243
Ethics
An introduction to classical and modern logic; major concerns and approaches to ethics are considered, with emphasis on modern ethical problems. 3 hours Lecture and Discussion — 3 credits.

LA 4372
Marriage and Family Counseling
This course is designed to introduce systems theories that are utilized in marriage and family counseling. Topics include family development, and the issues, concepts and interventions associated with major family therapy models. Prerequisite: Introduction to Psychology. 3 hours Lecture and Discussion — 3 credits.

LA 4583
Introduction to Behavior Modification
An introduction to the concepts, theories and applications of learning theory and behaviorism as they are applied to a variety of treatment conditions and applications in a variety of settings, with special emphasis on school settings. Prerequisite: Introduction to Psychology. 3 hours Lecture and Discussion — 3 credits.

LA 4892
Childhood Psychopathology
This course explores the biological, psychological and social/cultural factors in the etiology, course and treatment of childhood disorders. Prerequisite: Introduction to Psychology. Suggested Prerequisite: Abnormal Psychology. 3 hours Lecture and Discussion — 3 credits.

MATHEMATICS AND PHYSICS

MP 0009
Algebra II (High School)
This course is designed to prepare those students who do not have the requisite high school algebra background for the courses in college algebra which are required for a college degree. 3 hours Lecture and Discussion — 0 credits.

MP 0010
Basic Mathematics
A review of fundamental arithmetic and algebra to familiarize the students with the basic concepts of mathematics. The course is designed to provide the student with the requisite foundation and practice in preparation for the MP 1102, 1203 or 1205 sequence. Students assigned to this course are required to take MP 1102 College Algebra and MP 1203 Elementary Functions or MP 1205 Finite Mathematics to fulfill the Mathematics Core Curriculum requirement. 3 hours Lecture and Discussion — 3 institutional credits (Institutional credit will not be applied to either
required or elective credits, but will be counted
toward determining full-time status.)

**MP 1102**  
*College Algebra*
This course provides a detailed treatment of basic algebra, stressing solution of equations and problem-solving techniques. Emphasis throughout is on practical applications and manipulative skills. Prerequisite: Successful completion of MP 0010 Basic Mathematics or satisfactory performance on appropriate diagnostic exams administered to entering students. 3 hours Lecture and Discussion — 3 credits

**MP 1105**  
*Discrete Mathematics*
An introduction to the theory and application of discrete mathematics. Topics include logic, sets, functions and relations, combinations and elementary probability. Prerequisite: College Algebra. 3 hours Lecture and Discussion — 3 credits

**MP 1203**  
*Elementary Functions*
Mathematical functions, including logarithms and trigonometry, are treated from both the numerical and functional viewpoints. Emphasis throughout is on practical applications and manipulative skills. This course serves as a precalculus background. Prerequisite: College Algebra or its equivalent, as determined by the department, or satisfactory performance on appropriate diagnostic exams administered to entering students. 3 hours Lecture and Discussion — 3 credits

**MP 1204**  
*Calculus I*
This is a one-semester calculus course designed to introduce the student to the basic ideas, techniques, and applications of differential and integral calculus of a single-variable. Prerequisite: Elementary Functions or satisfactory performance on appropriate diagnostic exams administered to entering students. 4 hours Lecture and Discussion — 4 credits

**MP 1205**  
*Finite Mathematics*
This course provides students with an overview of finite mathematics. Topics include systems of linear equations and inequalities, linear programming, matrix theory, mathematics of finance, set theory, and combinatorics. Prerequisites: College Algebra or its equivalent, as determined by the department or satisfactory performance on appropriate diagnostic exams administered to entering students. 3 hours Lecture and Discussion — 3 credits

**MP 1206**  
*Geometry*
An overview of classical and modern geometry and its applications with an introduction to the axiomatic approach and the concepts of mathematical proof. Prerequisite: Elementary Functions. 3 hours Lecture and Discussion — 3 credits

**MP 2114**  
*Business Statistics I*
An introduction to the concepts of probability and statistics. Topics include data analysis and description, probability, probability distributions, sampling distributions, and estimation. Prerequisite: Elementary Functions or Finite Mathematics. 3 hours Lecture and Discussion — 3 credits

**MP 2115**  
*Introduction to Actuarial Science*
This course provides a basic introduction to actuarial science and its role in insurance as a discipline and an industry. Topics include a brief history of the evolution of the actuarial profession, basic mathematics of simple and compound interest, and introduction to probability theory, and applications of material to risk management and insurance. Prerequisite: Elementary Functions or Finite Mathematics or equivalent, as determined by the department. 3 hours Lecture and Discussion — 3 credits

**MP 2116**  
*Statistical Quality Control*
This course provides an introduction to the purpose and function of statistical quality control. Topics include the use of modern statistical methods for quality control and improvement as well as the principles of statistical quality control and their application in a variety of situations. Prerequisite: Elementary Functions or its equivalent, as determined by the department. 3 hours Lecture and Discussion — 3 credits

**MP 2119, MP 2219**  
*Physics I and II*
This is a general course stressing understanding of physical principles and methods of problem solving. The first semester covers the basic principles of mechanics, heat, and the kinetic theory of gases. The second semester covers electricity, magnetism, wave
motion, light, and selected topics in modern physics. In the laboratory, experiments are performed illustrating the basic physical principles and methods of experimental science. Prerequisites: Elementary Functions is a prerequisite for Physics I, and Physics I is a prerequisite for Physics II. 3 hours Lecture and Discussion, 3 hours Laboratory — 4 credits each.

MP 2121  
**Calculus II**  
This course is a continuation of Calculus I. Topics include methods of integration, infinite series, functions of several variables, partial differentiation and multiple integration. Prerequisite: Calculus I. 4 hours Lecture and Discussion — 4 credits.

MP 2123, MP 2224  
**Physics Ic and IIc**  
This is a general course which uses calculus to stress the understanding of physical principles and the methods of problem solving. The first semester covers the basic principles of mechanics, heat, and the kinetic theory of gases. The second semester covers electricity, magnetism, wave motion, and light. In the laboratory, experiments are performed illustrating the basic physical principles and methods of experimental science. Prerequisites: Calculus I is a prerequisite for Physics Ic, Physics Ic is a prerequisite for Physics IIc. 3 hours Lecture and Discussion, 3 hours Laboratory — 4 credits each. Students may take the lab that accompanies MP 2119 or MP 2219.

MP 2126  
**Linear Algebra**  
This course is an introduction to linear algebra. Topics may include systems of linear equations, matrices, determinants, vector spaces, linear transformations, eigenvalues and eigenvectors, and applications. Prerequisite: Calculus I. 3 hours Lecture and Discussion — 3 credits.

MP 2214  
**Business Statistics II**  
This is a course in statistical inference. Topics include parametric and non-parametric hypothesis tests on means and proportions, Chi squared tests, analysis of variance, regression, and correlation. Practical applications are stressed. Prerequisite: Business Statistics I. 3 hours Lecture and Discussion — 3 credits.

MP 2215  
**Statistics for Business**  
This course provides an introduction to the concepts of probability and statistics. Topics include data analysis and description, probability distributions, sampling distributions, estimation, and hypothesis testing. Prerequisite: Elementary Functions, Finite Mathematics, or an equivalent course, as determined by the department. 4 hours Lecture and Discussion — 4 credits.

MP 2223  
**Ordinary Differential Equations**  
This course covers the solution of ordinary differential equations. The topics of discussion include solution of first-order equations, linear equations with constant coefficients, and series solution of differential equations. Applications are stressed. Prerequisite: Calculus II, Physics II or IIc. 3 hours Lecture and Discussion — 3 credits.

MP 2230  
**Numerical Methods**  
A study of numerical methods involved in interpolation, differentiations and integration, numerical solutions of equations and systems of equations, and fitting empirical data. Applications are stressed. Prerequisites: Calculus II or both a programming Language and Elementary Functions. 3 hours Lecture and Discussion — 3 credits.

MP 3036  
**Methods in Advanced Mathematics**  
An introduction to the study of formal mathematics, with an emphasis on proofs. Topics may include finite mathematics and combinatorics, elementary number theory, and analysis. Prerequisite: Calculus II. 2 hours Lecture and Discussion — 2 credits.

MP 3037  
**Modern Algebra and Number Theory**  
An introduction to the theory of groups, rings, fields and polynomials, and the theory of numbers including unique factorization, congruence classes and the distribution of primes. Prerequisites: Linear Algebra and Methods in Advanced Mathematics or Permission of Instructor. 3 hours Lecture and Discussion — 3 credits.

MP 3120  
**Foundations of Mathematics**  
This course presents the logical and philosophical bases of mathematical structures and modes of thinking. This includes discussion of Godel’s theorem, the notion of completeness, the Axiom of Choice, and the Peano postulates. Prerequisite: Calculus I or Permission of Instructor. 3 hours Lecture and Discussion — 3 credits.
MP 3123
**Advanced Calculus**
This course provides an in-depth look at the calculus of several variables. Topics include the geometry of n-dimensional space, differentiation and integration of functions of several variables, integrals over curves and surfaces, and the theorems of Green, Stokes and Gauss. Prerequisite: Calculus II. 3 hours Lecture and Discussion — 3 credits

MP 3124
**Physics IIIc**
This course covers the modern concepts of physics and stresses appropriate mathematical techniques. The topics include special theory of relativity, important historical experiments, the classical theory of the electron, the Rutherford atom, the Bohr atom, early ideas on quantization, postulational quantum mechanics from the Schroedinger point of view, and the one electron atom. Prerequisites: Ordinary Differential Equations and either Physics II or IIc. 3 hours Lecture and Discussion — 3 credits

MP 3140
**Applied Mathematics**
The course covers the mathematical tools for treating a variety of problems in science; boundary value problems for differential equations, Green’s functions, calculus of variations, spectral theory of operators, and other topics as time permits are included. Prerequisites: Ordinary Differential Equations and Physics IIc. 3 hours Lecture and Discussion — 3 credits

MP 3231
**Statistics for Science**
A course in basic and intermediate methods of applied statistics, with emphasis on the analysis of data from laboratory and field experiments. Both parametric and non-parametric techniques are presented, and the logic underlying experimental design and statistical inference is stressed. Recommended for students anticipating graduate study or research careers. Prerequisite: Elementary Functions or Finite Mathematics. 3 hours Lecture and Discussion — 3 credits

MP 3235
**Fourier Series**
This is an introduction to Fourier series and eigenvalue functions covering the topics of orthogonal systems, Fourier series, eigenvalue functions and boundary value problems with an introduction to the derivation and classification of partial differential equations. Prerequisite: Ordinary Differential Equations. 3 hours Lecture and Discussion — 3 credits

MP 3241
**History of Mathematics**
Development of mathematics from the earliest days to the present, with emphasis on Greek mathematics, the development of calculus, and the history of algebra, analysis, and geometry in the nineteenth and twentieth centuries. Prerequisite: Calculus I or Permission of Instructor. 3 hours Lecture and Discussion — 3 credits

MP 4115, MP 4215
**Mathematics Seminar**
A program of individual reading, discussion, and student presentation of material on selected topics in mathematics. Prerequisites: Advanced Calculus and Modern Algebra. 1 hour Lecture and Discussion — 1 credit each

MP 4122
**Analysis**
This course is an introduction to the ideas and theorems of real analysis. Topics include basic set theory, function theory, topology, sequences and series, and the limits, continuity, differentiation and integration of functions on metric and Euclidean spaces. Prerequisite: Advanced Calculus and Methods in Advanced Mathematics. 3 hours Lecture and Discussion — 3 credits

MP 4125
**Partial Differential Equations**
Topics include eigenfunctions, expansions, separation of variables, types of partial differential equations, numerical methods, similarity solutions, and perturbation theory. Prerequisite: Advanced Calculus. 3 hours Lecture and Discussion — 3 credits

MP 4132
**Symbolic Logic**
Topics covered include Boolean algebra, logic circuit analysis, Karnaugh mapping, IC logic families, D/A and A/D conversions, memory devices, flip-flops, arithmetic circuits, number systems and codes, and interfacing. Prerequisites: Elementary Functions or Finite Math and either Physics II or a computer course. 3 hours Lecture and Discussion, 3 hours Laboratory — 4 credits

MP 4227
**Complex Variables**
This is an introduction to the theory of functions of complex variables. Topics covered are derivatives, Cauchy Riemann equations, harmonic functions, integrals, Cauchy’s Integral formula and power series. Additional topics may include conformal mapping and the theory of residues. Prerequisite: Advanced
Calculus and either Linear Algebra or Methods in Advanced Mathematics. 3 hours Lecture and Discussion — 3 credits

MP 4228
Special Topics in Mathematics
Topics to be decided at the discretion of Instructor and enrolled students. Prerequisite: Permission of Instructor. 3 hours Lecture and Discussion — 3 credits

ORNAMENTAL HORTICULTURE AND ENVIRONMENTAL DESIGN

OH 2014
Floriculture Techniques
This course stresses the application of basic floriculture, greenhouse management and crop-production techniques, as well as fundamental florist skills, through hands-on laboratories in small groups and practical lectures. Required for all Ornamental Horticulture majors. 2 hours Lecture and 3 hours Laboratory — 3 credits

OH 2015
Landscape Techniques
This course stresses the application of basic landscaping, landscape maintenance and nursery production, handling and marketing techniques through hands-on laboratories in small groups and practical lectures. Required for all Ornamental Horticulture majors. 2 hours Lecture and 3 hours Laboratory — 3 credits

OH 2118
Woody Plant Identification II
The course focuses on the identification, culture and landscape uses of native and introduced trees, shrubs and vines. This Spring course features evergreen coniferous plants and spring blooming plants. Extensive use is made of the Henry Schmieder Arboretum plant collections on campus. CAN be taken without Woody Plant Identification I. 1 hour Lecture and 3 hours Laboratory — 2 credits

OH 2220
Woody Plant Identification I
The course focuses on the identification, culture and landscape uses of native and introduced trees, shrubs and vines. This fall course features plants that bloom in the summer and fall as well as plants that display autumn foliage and fruits. Extensive use is made of the Henry Schmieder Arboretum plant collections on campus. 1 hour Lecture and 3 hours Laboratory — 2 credits

OH 2370
Employment Program
Each student in Ornamental Horticulture and Environmental Design is required to spend 500 hours in approved jobs related to the student’s major. Each employment experience that will be used toward the Employment Program must be registered with the Office of Career and Life Education before employment commences — 4 credits

OH 3000, 4000
Selected Topics I and II
Special projects designed to meet individual needs of students in the specialized fields of agriculture. Projects arranged on a one-to-one basis with a department faculty member and with the approval of the Department Chairperson. Total Selected Topics credit accepted toward graduation is limited to 2 credits. 3 hours of student/faculty instruction per week — 1 credit each

OH 3005
Plant Propagation
The course covers, in theory and practice, the principles and methods involved in the propagation of woody and herbaceous plants. Sexual reproduction and asexual reproduction by cuttings, graftage, layering, etc. are considered and practiced. 2 hours Lecture and 3 hours Laboratory — 3 credits

OH 3020
Basic Design
A practical and applied approach to the elements and principles of design, using mixed mediums. The course culminates with a three-dimensional presentation. 2 hours Studio — 1 credit

OH 3101
Flower Show Practicum
In this course, students are involved with every aspect of a major exhibit at the Philadelphia Flower Show, the largest indoor flower show in the world. Field trips and guest lecturers are used extensively to enrich the course. NOTE: This special course runs from September through March and requires participation outside of scheduled class hours. Students must register for both for Fall and Spring semesters. Total practicum credit accepted towards graduation is limited to 2 credits — 1 credit, pass/fail