2014 APEA Course List

Courses meet daily unless otherwise noted. Full courses at Carnegie Mellon carry 9 to 12 units, corresponding to 3 to 4 credits at other U.S. colleges and universities. Students who reside in university housing must be enrolled in two full courses, while commuter students have the option to enroll in either one or two full courses. Students who wish to enroll in more than 25 units must first receive approval from the APEA Program Director, Dr. William Alba (alba@cmu.edu, 412-268-7333).

Newly listed courses for the APEA Program in 2014 include:

09-106  Modern Chemistry II  
33-101  Science and Science Fiction  
33-124  Introduction to Astronomy  
70-122  Introduction to Accounting  
76-234  20th Century American Literary and Cultural Studies: Novels and Films about the US Economy  
76-270  Writing for the Professions  
79-255  Irish History  
80-135  Introduction to Political Philosophy  
80-205  Introduction to Rational Choice

Visit www.cmu.edu/enrollment/pre-college/apea.html for up-to-date course availability and class times. Additional courses may be available during the university’s concurrent Summer Session 2 for appropriately prepared students. The faculty member teaching the course and the APEA Director must authorize your choice. For a complete listing of available Summer Session 2 courses, contact Dr. William Alba.

Some of the courses in the following list are especially designated for APEA, and some involve a combined population of APEA students with regular degree students. In either case, all courses in the APEA Program offer the same quality of instruction and expectation of work as during the fall or spring at Carnegie Mellon.

After reviewing these course descriptions and, if needed, consulting by phone or email with the APEA Director about course choices, **return your course request form with your deposit and the rest of your Pre-College enrollment forms.** Courses will fill in the order that deposits and forms are received by the university.

To view your course schedule, visit Student Information Online on the HUB’s website ([www.cmu.edu/hub/sio](http://www.cmu.edu/hub/sio)) after acquiring your Carnegie Mellon University Andrew ID and password. Please allow time for various university offices to receive and process your deposit and enrollment forms.

Students may request schedule changes until the end of the second day of classes (July 1, 2014) by contacting the APEA Director before arrival or by meeting the APEA Director once the program begins. Students and their families are responsible for communicating to each other any changes in their academic plan.
<table>
<thead>
<tr>
<th>Units</th>
<th>Course Title</th>
<th>MTWRF (unless indicated)</th>
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<tbody>
<tr>
<td>9</td>
<td>03-121E Modern Biology</td>
<td>9:00a-10:20a</td>
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<tr>
<td>9</td>
<td>03-124E Modern Biology Lab</td>
<td>MW 12:00n-2:50p</td>
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<tr>
<td>3</td>
<td>09-101E Introduction to Experimental Chemistry</td>
<td>M 1:30p-4:20p and W 1:30p-4:20p</td>
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<tr>
<td>10</td>
<td>09-105E Introduction to Modern Chemistry I</td>
<td>10:30a-11:50a</td>
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<tr>
<td>10</td>
<td>09-106E Modern Chemistry II</td>
<td>10:30a-11:50a</td>
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<tr>
<td>10</td>
<td>15-110E Principles of Computing</td>
<td>9:00a-10:20a and 4:30p-5:50p</td>
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<tr>
<td>12</td>
<td>15-112E Fundamentals of Programming &amp; Computer Science</td>
<td>9:00a-10:20a and 4:30p-5:30p</td>
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<tr>
<td>10</td>
<td>15-122E Principles of Imperative Computation</td>
<td>10:30a-11:50a and 3:00p-4:20p</td>
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<tr>
<td>12</td>
<td>18-100E Introduction to Electrical and Computer Engineering</td>
<td>10:30a-11:50a, MWF 3:00p-4:20p, and TR 1:30p-4:20p</td>
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<tr>
<td>10</td>
<td>21-120E Differential and Integral Calculus</td>
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<td>12</td>
<td>21-120F Differential and Integral Calculus</td>
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<td>10</td>
<td>21-122E Integration and Approximation</td>
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<td>9</td>
<td>21-127E Concepts of Mathematics</td>
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<td>9</td>
<td>21-259E Calculus in Three Dimensions</td>
<td>9:00a-10:20a</td>
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<td>9</td>
<td>21-260E Differential Equations</td>
<td>9:00a-10:20a</td>
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<td>9</td>
<td>27-052E Introduction to Nanoscience and Technology</td>
<td>MWF 1:00p-2:50p</td>
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<td>3</td>
<td>33-101E Seminar: Science and Science Fiction</td>
<td>MTW 1:30p-2:20p</td>
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<tr>
<td>12</td>
<td>33-106E Physics for Engineering Students I</td>
<td>12:30p-2:50p</td>
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<tr>
<td>12</td>
<td>33-107E Physics for Engineering Students II</td>
<td>9:30a-11:50a</td>
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<tr>
<td>9</td>
<td>33-115E Physics for Future Presidents</td>
<td>3:00p-4:20p</td>
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<td>9</td>
<td>33-124E Introduction to Astronomy</td>
<td>12:00n-1:20p</td>
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<td>9</td>
<td>36-201E Statistical Reasoning and Practice</td>
<td>10:30a-11:50a</td>
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<td>9</td>
<td>51-260E Design Fundamentals</td>
<td>1:30p-3:20p</td>
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<td>9</td>
<td>57-341E Sound Recording Workshop</td>
<td>MWF 1:30p-2:50p and MW 6:30p-9:20p</td>
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<tr>
<td>9</td>
<td>62-330E Filmothea: Seminar in Film Music</td>
<td>MW 1:30p-4:20p</td>
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<td>9</td>
<td>70-122E Introduction to Accounting</td>
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<td>9</td>
<td>73-100E Principles of Economics</td>
<td>1:30p-2:50p</td>
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<td>9</td>
<td>76-101E Interpretation and Argument: Urban Design</td>
<td>3:00p-4:20p</td>
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<tr>
<td>9</td>
<td>76-101F Interpretation and Argument: Is Technology Overrated?</td>
<td>1:30p-2:50p</td>
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<td>9</td>
<td>76-234E Novels and Films about the US Economy</td>
<td>12:00n-1:20p</td>
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<td>76-270E Writing for the Professions</td>
<td>10:30a-11:50a</td>
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<td>9</td>
<td>79-104E Global Histories: The History of Capitalism</td>
<td>12:00n-1:20p</td>
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<td>9</td>
<td>79-255E Irish History</td>
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<td>9</td>
<td>80-100E Introduction to Philosophy</td>
<td>12:00n-1:20p</td>
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<td>9</td>
<td>80-135E Introduction to Political Philosophy</td>
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<td>80-205E Introduction to Rational Choice</td>
<td>1:30p-2:50p</td>
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<td>9</td>
<td>80-212E Logic and Argument Analysis</td>
<td>10:30a-11:50a</td>
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<td>9</td>
<td>80-220E Philosophy of Science</td>
<td>1:30p-2:50p</td>
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<tr>
<td>12</td>
<td>82-101E Elementary French I</td>
<td>10:30a-11:50a</td>
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<tr>
<td>12</td>
<td>82-131E Elementary Chinese I</td>
<td>10:30a-11:50a</td>
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<td>12</td>
<td>82-141E Elementary Spanish I</td>
<td>9:00a-10:20a</td>
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<tr>
<td>12</td>
<td>82-171E Elementary Japanese I</td>
<td>9:00a-10:20a</td>
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*Beyond these beginning courses in French, Chinese, Spanish, and Japanese, a large number of Elementary, Intermediate, and Advanced courses are available in those three languages as well as in Arabic and Italian.*

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<tr>
<td>9</td>
<td>85-102E Introduction to Psychology</td>
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<td>9</td>
<td>85-241E Social Psychology</td>
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03-121 Modern Biology (9 units)
This is an introductory course with no lab component that provides the basis for further studies in biochemistry, cell biology, genetics and molecular biology. This course emphasizes the chemical principles underlying biological processes and cell structures as well as the analysis of genetics and heredity from a molecular perspective. This is the introductory biology course for all science and non-science majors at Carnegie Mellon. 80-minute daily lecture.

03-124 Modern Biology Laboratory (9 units)
This laboratory is designed to introduce students to modern concepts in the biological sciences. The experiments illustrate many of the principles covered in 03-121. Experimentation using living organisms and/or their tissues, cells or molecules is an essential component of this course. 3-hour laboratory / lecture two times per week.

09-101 Introduction to Experimental Chemistry (3 units)
This course gives students hands-on experience with laboratory methods and techniques. Experiments include the synthesis and characterization of organic compounds (aspirin and “oil of wintergreen”); a kinetics experiment that involves the determination of the rate law of a chemical reaction; a thermochemistry experiment that investigates the products of a transition metal complexation reaction; and various studies involving iron properties and content. The course is offered at no additional tuition charge to students enrolled in APEA. There is a $45 lab fee for materials and supplies. 50-minute weekly lecture and 3-hour weekly laboratory. When you enroll in 09-105 (Introduction to Modern Chemistry I) as an APEA student, by default you will also be enrolled in 09-101 (Introduction to Experimental Chemistry) unless that conflicts with another course you have selected.

09-105 Introduction to Modern Chemistry I (10 units)
This course begins with a very brief survey of some fundamental principles of chemistry and a presentation of chemically interesting applications and sophisticated problems. These will form the basis for introducing the relationships between the structure of molecules and their chemical properties and behavior. The subject matter will include principles of atomic structure, chemical bonding and molecular structures of organic and inorganic compounds including some transition metal complexes. Relevant examples will be drawn from such areas as environmental, materials and biological chemistry. This is an introductory chemistry course for students interested in engineering, science and other related disciplines at Carnegie Mellon. 80-minute daily lecture. When you enroll in 09-105 (Introduction to Modern Chemistry I) as an APEA student, by default you will also be enrolled in 09-101 (Introduction to Experimental Chemistry) unless that conflicts with another course you have selected.

09-106 Modern Chemistry II (10 units)
This course provides an overview of thermodynamics, kinetics and chemical equilibrium. Topics include the flow of energy in chemical systems; the spontaneity of chemical processes, i.e. entropy and free energy; the mechanisms and rates of chemical reactions; and the use of chemical equilibrium to reason about acid-base chemistry, solubility and electrochemistry. Applications include the energy economy, biological systems and environmental chemistry. This
is the second semester of the year-long introductory chemistry course for students interested in engineering, science and other related disciplines at Carnegie Mellon. 80-minute daily lecture. When you enroll in 09-106 (Modern Chemistry II) as an APEA student, by default you will also be enrolled in 09-101 (Introduction to Experimental Chemistry) unless that conflicts with another course you have selected.

15-110 Principles of Computing (10 units)
This is a course in fundamental computing principles for students with minimal or no computing background. Programming constructs: sequencing, selection, iteration, and recursion. Data organization: arrays and lists. Use of abstraction in computing: data representation, computer organization, computer networks, functional decomposition, and application programming interfaces. Use of computational principles in problem-solving: divide and conquer, randomness, and concurrency. Classification of computational problems based on complexity, non-computable functions, and using heuristics to find reasonable solutions to complex problems. Social, ethical and legal issues associated with the development of new computational artifacts will also be discussed. 80-minute daily lecture and 80-minute daily recitation.

15-112 Fundamentals of Programming and Computer Science (12 units)
This is a technical introduction to the fundamentals of programming with an emphasis on producing clear, robust, and reasonably efficient code using top-down design, informal analysis, and effective testing and debugging. Starting from first principles, we will cover a large subset of the Python programming language, including its standard libraries and programming paradigms. We will also target numerous deployment scenarios, including standalone programs, shell scripts, and web-based applications. This course assumes no prior programming experience. Even so, it is a fast-paced and rigorous preparation for 15-122. Students seeking a gentler introduction to computer science should consider first taking 15-110. 80-minute daily lecture and 80-minute daily recitation.

Note on 15-110 vs. 15-112: Both courses are introductory, assuming no prior programming experience. If you are certain at this time that you want to study Electrical and Computer Engineering (ECE) or Computer Science (CS) as a major or minor during college, or if you want to want to take an immense amount of time during the summer doing programming, you should consider 15-112. On the other hand, if you are exploring the possibility of majoring in CS or ECE, intend to apply CS primarily towards other areas, or want to get a broad sense of computer science and how computer scientists approach problems, 15-110 is much more appropriate for you. While both courses are scheduled at the same time in order to permit students to transfer between them during the first two days of the summer session, exercise your own best judgment about which course is more suitable before you arrive.

15-122 Principles of Imperative Computation (10 units)
This course is for students with a basic understanding of programming (variables, expressions, loops, arrays, functions). It teaches imperative programming and methods for ensuring the
correctness of programs. Students will learn the process and concepts needed to go from high-level descriptions of algorithms to correct imperative implementations, with specific application to basic data structures and algorithms. Much of the course will be conducted in a subset of C amenable to verification, with a transition to full C near the end. Prerequisites: 15-112 or equivalent (such as 4 or 5 on the AP Computer Science exam). Students uncertain of their background are strongly advised contact Dr. Alba and arrange to complete the School of Computer Science placement exam before enrolling in 15-122. All students enrolled in 15-122 must also have completed 21-127 (Concepts of Mathematics) here previously, or be co-enrolled this summer in 21-127. 80-minute daily lecture and 80-minute daily recitation.

18-100 Introduction to Electrical and Computer Engineering (12 units)
This course introduces the basic concepts of electrical and computer engineering through theoretical concepts in lectures, project work in the lab, and problem-solving exercises. We will analyze, construct and test circuits that are the basis for an audio amplifier, and analog to digital and back to analog systems using a microprocessor. Specific topics that will be covered include system decomposition, real and ideal sources, Kirchoff’s and Ohm’s Laws, linear and nonlinear circuit elements, ideal op-amp characteristics and circuits, energy storage elements and their operation in both the time- and frequency-domains, basic signal processing including modulation and sampling, combinational logic, Karnaugh Maps, sequential logic and Flip-Flops, and the basics of microprocessors. Prerequisite: high school technical course such as chemistry or physics. NOTE: we will assume students have knowledge of complex numbers in rectangular and polar forms, can convert between the two, and can add, subtract, multiply and divide complex numbers. Junior or senior standing in high school required, senior is preferred. This is the same rigorous course required of entering ECE majors. 80-minute daily lecture, 80-minute recitation thrice weekly and 3-hour laboratory session twice weekly.

21-120 Differential and Integral Calculus (10 units)
This course includes but is not limited to the study of functions, limits, derivatives, logarithmic, exponential and trigonometric functions, inverse functions, L’Hospital’s Rule, curve sketching, Mean Value Theorem, related rates, linear and quadratic approximations, maximum-minimum problems and applications of integration. Prerequisite: high school pre-calculus course with trigonometry, exponential functions and logarithmic functions. Contact the APEA Director if you have questions about preparation. This is the first main calculus course at Carnegie Mellon. Students who have successfully completed AP Calculus AB or an equivalent course should enroll in the higher-level 21-122. 80-minute daily lecture.

21-122 Integration, Differential Equations and Approximation (10 units)
This course includes but is not limited to the study of integration by trigonometric substitution and partial fractions, arclength, improper integrals, Simpson’s and Trapezoidal Rules for numerical integration, Newton’s method, Taylor’s Theorem including a discussion of the remainder, sequences, series, power series. This is the second main calculus course at Carnegie Mellon. Students who have successfully completed AP Calculus BC or an equivalent course should enroll in a higher-level math course, such as 21-259. 80-minute daily lecture.
21-127 Concepts of Mathematics (9 units)
This is a rigorous course and should be taken only by students with a very serious interest in abstract or discrete mathematics. This course includes an introduction to the algebra of sets, relations, functions and partitions and a basic introduction to elementary number theory. The techniques of proof introduced include proof by induction, proof by specialization and division into cases, indirect proof, existence and uniqueness proofs and nonconstructive methods. Approval of the instructor or the Mathematical Sciences Department may be required. This course is rewarding but challenging, even for students who have already taken difficult high school math courses. 80-minute daily lecture.

21-259 Calculus in Three Dimensions (9 units)
Vectors, lines, planes, quadratic surfaces, polar, cylindrical and spherical coordinates, partial derivatives, directional derivatives, gradient, divergence, curl, chain rule, maximum-minimum problems, multiple integrals, parametric surfaces and curves, line integrals, surface integrals, Green-Gauss theorems. Prerequisite: 21-120 and 21-122 or equivalent coursework. This course is the third main calculus course at Carnegie Mellon. 80-minute daily lecture.

21-260 Differential Equations (9 units)

27-052 Introduction to Nanoscience and Technology (9 units)
This course introduces the fundamental properties of materials with characteristic length scales in the nanometer (10^-9 meter) range, the principles underlying the synthesis and engineering of nanomaterials as well as elemental entrepreneurial and ethical frameworks to understand the socio-economic impact of nanotechnologies. The various aspects related to field of nanotechnology will be reviewed to provide the context for the subsequent discussion of the fundamental physical concepts related to nanomaterials, the bottom-up and top-down engineering of nanostructures, the characterization of nanomaterials as well as applications of nanotechnologies. Case studies will introduce students to the opportunities and challenges of nanotechnologies. The course is primarily designed for students with interest in pursuing science or engineering studies but also intended to provide students outside the science and engineering domain an understanding of the fundamental concepts that are underlying the emerging field of nanotechnology. 110-minute meetings three times per week.

33-101 Seminar: Science and Science Fiction (3 units)
We will view and critique the science content in a selection of science fiction films, spanning more than 100 years of cinematic history, and from sci-fi TV shows from the past 50+ years. Guided by selected readings from current scientific literature, and aided by order-of-magnitude estimates and careful calculations, we will ponder whether the films are showing things which may fall into one of the following categories: (1) Science fiction at the time of production, but currently possible, due to recent breakthroughs; (2) Possible, in principle, but beyond our
current technology; (3) Impossible by any science we know. Success of this course will depend upon class participation. Students will be expected to contribute to discussion of assigned readings, and to write a short final paper on a sci-fi topic of their choice. APEA students may enroll at no extra fee in this 3-unit course in addition to their other courses. 50-minute session three times per week.

33-106 Physics for Engineering Students I [Mechanics] (12 units)
This course covers basic principles of mechanics and thermodynamics; vectors, displacement, velocity, accelerations, force, equilibrium, mass, Newton’s law, gravitation, work, energy, momentum, impulse, temperature, heat, equations of state, thermodynamic process, heat engines, refrigerators, first and second laws of thermodynamics and kinetic theory of gases. Taking Calculus concurrently is strongly advised. This course is required of all engineering students at Carnegie Mellon. 70-minute daily lecture and 70-minute daily recitation.

33-107 Physics for Engineering Students II [Electricity and Magnetism] (12 units)
This course is the second part of a two-semester freshman calculus-based introductory physics sequence for engineering students. The course covers waves, including standing and traveling waves, superposition, beats, reflection, interference, electricity, including electrostatics and electric fields, Gauss’ law, electric potential, simple circuits and magnetism, including magnetic forces, magnetic fields, induction and electromagnetic radiation. Prerequisites: high school calculus course or concurrent enrollment in 21-120. Completion of a physics course in mechanics or equivalent course in high school is recommended. 70-minute daily lecture and 70-minute daily recitation.

33-115 Physics for Future Presidents (9 units)
Countless topics of social and political importance are intimately related to science in general and physics in particular. Examples include energy production, global warming, radioactivity, terrorism, and space travel. This course aims to provide key bits of knowledge based on which such issues can be discussed in a meaningful way, i.e., on the level of arguments and not just vague beliefs. We will cover an unusually wide range of topics, including energy, heat, gravity, atoms, radioactivity, chain reactions, electricity, magnetism, waves, light, weather, and climate. No calculus or algebra will be required. 80-minute daily lecture.

33-124 Introduction to Astronomy (9 units)
Astronomy continues to enjoy a golden age of exploration and discovery. This course presents a broad view of astronomy, straightforwardly descriptive and without any complex mathematics. The goal of the course is to encourage non-technical students to become scientifically literate and to appreciate new developments in the world of science, especially in the rapidly developing field of astronomy. Subjects covered include the solar system, stars, galaxies and the universe as a whole. The student should develop an appreciation of the ever-changing universe and our place within it. Computer laboratory exercises will be used to gain practical experience in astronomical techniques. In addition, small telescopes will be used to study the sky. This course is specifically geared toward non-science/engineering majors. 80-minute daily lecture.
36-201 Statistical Reasoning and Practice (9 units)
Numerical data surrounds us – from baseball box scores to the gross national product; from crime statistics to demographic trends. Statistical methodology and practice allows us to quantify data in order to draw conclusions. The course will introduce basic concepts involved in statistical reasoning. The major topics include methods for exploratory data analysis, research methods and methods for statistical inference. The course will include the use of the computer to facilitate the understanding of important statistical ideas and for the implementation of data analysis. In addition to lectures, students will attend computer labs each week. 80-minute daily lecture.

51-260 Design Fundamentals (9 units)
Designers help create the artifacts of our everyday experiences – from software applications, to magazines and books, to automobiles, to toothbrushes. Over six weeks, experienced design faculty and design practitioners will take you through core experiences in the communications and product design processes. These experiences will include design research, conceptualization, three-dimensional design, working with images and text, and the presentation of your design work. Students will need a digital camera and may be asked to purchase up to $100 in materials to support class work. 110-minute daily sessions.

57-341 Sound Recording Workshop (9 units)
Centers around the new recording studio in the School of Music: how the studio works and how to record various types of music, using the recording studio and the Kresge Recital Hall, which has audio and video links to the recording studio. The method of instruction is to learn by doing, and the goal is to achieve professional-sounding results. Equipment includes a complete 24-track Pro-Tools system, professionally designed control room and an interesting array of microphones. All recording is direct to hard disc. The lecture portion will cover the basics of sound, wave propagation, human hearing, psychoacoustics, transducers (microphones and speakers), mixing consoles, signal processors, digital and analog recording systems and signal flow. There are no specific prerequisites for the course, although reading music and/or playing an instrument is helpful. 80-minute lecture three times per week, 3-hour lab twice weekly.

62-330 Filmothea: Seminar in Film Music (9 units)
The first 100 years of the 20th Century’s only original art form, whose advent has brought about tremendous social and cultural changes. Students view selected films, learning first the basics of film theory, cinema’s working structures and the function of music soundtrack. Ultimately, they are able to analyze in written essays and class discussions, the function and value of the music in a particular film and the cultural impact such music has had on society. The work of the course involves attendance at screenings and active participation in the following analytical discussions. Students are expected to present two written reports on films/readings and sustain a final oral presentation. 3-hour meeting twice weekly.
70-122 Introduction to Accounting (9 units)
This course provides the knowledge and skills necessary for the student to understand financial statements and financial records and make use of the information for management and investment decisions. Topics include an overview of financial statements and business decisions; the balance sheet, the income statement, and the cash flow statement; sales revenue, receivables, and cash; cost of goods sold and inventory; long-lived assets and depreciation, and amortization; current and long-term liabilities; owners’ equity; investments in other corporations; an introduction to financial statement analysis and international issues dealing with financial statements. 80-minute daily session.

73-100 Principles of Economics (9 units)
Literally, an introduction to economic principles, the goal of this course is to give students an understanding as to what constitutes good “economic thinking”. This thought process is grounded in the construction and use of economics models. Drawing on issues in both microeconomics and macroeconomics, fundamental principles are shown to transcend particular examples and allow the field to be seen as a coherent, unified whole. 80-minute daily session.

76-101 Interpretation and Argument (9 units)
This course is structured to introduce students to fundamental practices of critical reading and academic argument. Students are exposed to a variety of different texts, both fiction and nonfiction, so that they can explore and critically evaluate a single issue from multiple perspectives. They are taught to summarize and analyze arguments within that issue so that they may contribute an argument of their own. It is also geared toward helping students understand the requirements of college-level argumentation and composition. Becoming a competent writer in this way requires that students be reflective and strategic with their composing processes, particularly with planning, writing, reading, detecting and diagnosing problems within their own work, and finally with revising their own texts. Finally, the course provides opportunities for students to develop critical thinking skills for analyzing and producing texts within the context of an academic community. This course is required of all degree students at Carnegie Mellon. 80-minute daily session.

Section E – Urban Design: The Evolution of a City
When we think of Pittsburgh, we often envision the Golden Triangle, an image popularized by countless paintings and photographs of the city. But what might have someone seen if beholding the area 300 years ago? What might they have seen 100 years ago? 50 years ago?

In this 76-101 class, we will examine the development of Pittsburgh from a frontier wilderness to a 21st Century technological urban hub. In doing so, we look at the special obstacles the region’s unique geography and landscape held for the builders of Pittsburgh, the effects of pollution on Pittsburgh’s civic character and residents, and the effects of various urban reform movements in
Pittsburgh of both national and local origins—from the City Beautiful Movement of the late 19th and early 20th century to the more recent redevelopment, urban gardening, and public arts projects in neighborhoods like East Liberty, Garfield, and Homewood. In looking at the physical, economic, and cultural changes occurring in Pittsburgh over the years, we will hone in on debates over problems concerning urban design in the city. These will include problems associated with social issues like race and class (e.g. debates over public space, gentrification, and controversial civil works projects). They will also include problems associated with the environment (e.g. “green” building, natural resource extraction, and air pollution). Over the course of the class, we will learn strategies to help us analyze and synthesize the various positions and approaches in these debates and eventually contribute our own argument to one of them. Furthermore, in order to better envision and understand Pittsburgh’s history, we will visit some of the places under discussion, particularly those near Carnegie Mellon like Schenley Park and the Carnegie Library. There will also be some out-of-class assignments to go to places easily accessible by bus like the Waterfront in Homestead and Grant’s Hill downtown.

Section F – Is Technology Overrated?
We often use the phrase “technological progress” automatically and without really thinking about it. After all, technology moves us forward and makes our lives better. Or, does it? Recently, a number of high-profile news stories have called our attention to the dilemmas that accompany our “high tech” lifestyles. Whether we’re talking about drones, disappointing new Apple products, or ways in which our favorite Internet companies are complicit with the NSA’s invasion of our privacy, we’re increasingly being confronted with the idea that maybe “technological progress” isn’t so progressive after all.

In this course we’re going to assess technology critically by reading and dealing with arguments that approach technology from a number of different perspectives. Although we will cover a few significant technological issues from decades past, most of our focus will be on the last two generations or so. And of course, “technology” can’t mean anything and everything: our scope will be broad but not limitless, including such diverse topics as the emergence of the interstate highway system in the US, dilemmas that come with advances in health care, and the new and problematic culture of Silicon Valley. These are some of the subjects we’ll be encountering while we practice 101’s general goal of dealing with arguments: both in the classroom and in writing, students will assess, analyze, synthesize, and respond to arguments about the impact and role of technology in our lives. At the end of the course, students will contribute to the discussion with their own argument. This course intends to help students deal with arguments and think critically by questioning something that we often take for granted: the ultimate goodness of technological progress – or, perhaps we should say, technological change.
76-234 20th Century American Literary and Cultural Studies:
Novels and Films about the US Economy (9 units)
In this class we will read novels and watch films that address the last 25 years of the US Economy, either directly or through science fiction. Our goal will be to think about the relationship between literature and economics, and to explore the ways in which the cultural form of the novel/film/play has been shaped by and continues to shape our discussions of the US Economy. The class will include several field trips, including a field trip to the Rivers of Steel National Heritage Area. We will also host guests from the Pittsburgh business and labor communities. We will read a novel about a group of modern day indentured servants in The Ordinary Seaman (1998), the best selling expose of (not) getting by in America, Nickel and Dimed (2001), including the play version (2005), the haunting novel of a consultant who travels the US to fire people (Up in the Air [2001]), the breakout Young Adult novel, The Hunger Games (2008), and ending with two films about the 2008 crash, Margin Call (2011), which starred some CMU drama school alums, and the documentary Inside Job (2010). 200-level English courses are available only to students who have previously completed Interpretation and Argument (76-101) at Carnegie Mellon, including last summer. 80-minute daily session.

76-270 Writing for the Professions (9 units)
Writing in the Professions is a writing course specifically designed for juniors and seniors in all majors other than English. The course is appropriate for upper-level students in all CMU colleges, has no writing prerequisites, and assumes that you may not have had much college-level writing instruction past your freshman year. The basic idea of the course is to give you experience in developing the writing skills you will be expected to have as you make the transition from student to professional. The course will cover resume writing, proposal writing, writing instructions, the difference between writing for general and specific audiences, and analysis of visual aids in various texts. The course requires that students work both independently and in groups. 200-level English courses are available only to students who have previously completed Interpretation and Argument (76-101) at Carnegie Mellon, including last summer. 80-minute daily session.

79-104 Global Histories (9 units)
This course offers you several options for expanding on the skills you need to think globally through the medium of history. As their descriptions indicate, the differently titled lectures vary in their subject matter and the particular pathways they provide for exploring global processes. However, they all involve a mix of lectures and recitations; they have similar amounts of reading; and they all use essay-writing as the primary medium of assessment. Most importantly, they all strive to help you: (1) identify and assess the varied ways that scholars interpret global interactions as they unfold through time; (2) bring together insights from diverse fields in the humanities and social sciences to illuminate the development of global connections, differences, and divisions; (3) read, listen, discuss, take notes, and craft written arguments supported by different kinds of evidence; and, above all, (4) use explorations in global histories to engage the workings of the world today and in the future. 80-minute daily session.
Section E – The History of Capitalism
The importance of Capitalism for understanding the world and its history is unparalleled. As the predominant form of social and political as well as economic organization, no one alive in the world today remains unaffected by capitalism. But what exactly is capitalism? Where did it come from? How and why did it exert influence over industry, wars, revolutions and even sex? This course examines the long, violent, and often surprising story of capitalism, from its origins in the 17th century to its still-evolving present forms. Topics covered include: (1) the origins of capitalism as a system of political economy and social organization, (2) the influence capitalism had over the age of empire and industrialization, (3) the familial, social, and cultural effects of capitalism, (4) and the links between capitalism and war, revolution, and social movements in the twentieth century. The course is taught through a combination of lecture and discussion. We will study classic works of political economy, short films and stories, artwork and a selection of more recent scholarship.

79-255 Irish History (9 units)
This course surveys Irish history from the earliest human settlements until the present day, with emphasis on the period since the sixteenth century. Our main objective is to understand the sources of conflict in modern Ireland. In order to do that, however, we look at a number of topics such as the role of religion in Irish society; the causes of population growth, movement, and decline; changing forms of protest; and the formation of rival myths of the Irish past and its meaning. 80-minute daily session.

80-100 Introduction to Philosophy (9 units)
In this introductory course, we will explore three major areas of Philosophy: Ethics, Metaphysics and Epistemology. Accordingly, the course is divided into three sections. In each section, we will read primary sources and discuss some of the main philosophic problems associated with that area. These will include moral problems (Ethics), problems arising from the debates about free-will, personal identity, or intelligence (Metaphysics) and inquiries about the scope and limits of human knowledge (Epistemology). We will then introduce some theories designed to solve such problems, and try to understand the strengths and weaknesses of these theories. We will apply different techniques and theories to issues that we might encounter in the real world. We will use class discussions, homework and papers to learn skills for evaluating arguments. These skills include how to present a philosophic argument, what are the assumptions that justify it, what are its weaknesses and strengths, whether such weaknesses can be resolved and, if they cannot be resolved, why. 80-minute daily session.

80-135 Introduction to Political Philosophy (9 units)
As an introductory course, we will seek to trace out the historical and philosophical dimensions of the polis from its origins in Ancient Greece to its current manifestation in present-day society. Special emphasis will be placed on the concept of "democracy." The readings and lectures will focus on the history and concept of democracy (as an idea and as an institution); the basic concepts and problems of political philosophy (e.g., liberal and libertarian ideas of
justice); and applied political philosophy (e.g., regional initiatives in deliberative democracy). 80-minute daily session.

80-205 Introduction to Rational Choice (9 units)
This course is an introduction to rational choice theory, which is concerned with normative and descriptive accounts of individual and group decision making. This course will cover a variety of topics in decision theory, game theory, and social choice theory. Among other things, it will survey the main normative theories of decision making (von Neumann-Morgenstern theory, Anscombe-Aumann's theory, and Savage's theory) and the main descriptive theories of decision making found in psychology and economics. Possible topics include, but are not limited to, the following: non-expected utility, game theoretic problems of conflict and coordination, the role of heuristics in choice behavior and strategic reasoning, probabilistic forecasting, theories which abandon the Bayesian assumption that degrees of belief are precise, voting theory, group decision making, and Arrow's Theorem. This course will emphasize the role that formal methods play in the analysis of decisions, with an eye toward alternative applications of decision theory to issues in philosophy and social science. 80-minute daily session.

80-212 Arguments and Logical Analysis (9 units)
Are there rational methods that can further our knowledge? The notion of rational inquiry presupposes that there are appropriate methods for the pursuit of knowledge. In this course, we will investigate the means by which a successful argument justifies its conclusion, as well as various subtle ways in which other arguments fail. In the course of our inquiry, we will take a historically informed approach to studying logic and argumentative fallacies. We will also discover that these tools are useful for constructing and analyzing arguments in all disciplines from philosophy and history to psychology and physics. Our primary goal is to learn to use these tools to make our thinking and writing clearer, more precise, and more critical. To that end, our coursework will consist in homework and exams on topics in logic, as well as essays on a wide variety of topics. This course is intended for students from any discipline who would like to improve their writing and critical thinking skills. 80-minute daily session.

80-220 Philosophy of Science (9 units)
In this course, we will examine some historical case studies (e.g., the Copernican revolution in astronomy) against which we will assess views pertaining to the significance, justification, and production of scientific knowledge. For example, should scientific theories be understood literally or as computational devices for deriving new predictions? How can universal conclusions ever be justified by a finite data set? Does explanation contribute to a theory’s confirmation by the evidence? Does science aim to find the truth? Is probability in the world or only in our minds? Is explanation a matter of finding causes or are causes whatever it is that explains? Is scientific rationality objective or culture-relative? 80-minute daily session.

82-101 Elementary French I (12 units)
This course is for students who have never studied French. The emphasis is on all four skills (listening, speaking, reading, and writing) and on cultural information as it is presented in the text and through homework assignments. Regular participation in class is mandatory (four in-
class hours per week). In addition, this course requires that students spend time using different multimedia tools (audio CD, video, CD-ROM, ML server, Internet) to complete assignments. Information on how to use these tools will be provided. The elementary level is designed to help students learn to reflect upon and draw upon strategies used by good language learners in their second language study. If a student has studied French before, then s/he must take a placement exam. 80-minute daily session.

82-131 Elementary Chinese I (12 units)
This course is for beginners in Mandarin Chinese. Its goal is to train students in the basic skills of listening, speaking, reading and writing for daily communication in Chinese. Students will learn the phonetic transcriptions of Chinese (Pinyin) for speaking and listening as well as Chinese characters for reading and writing. Basic vocabulary and sentence patterns used in everyday life are taught so that students will be able to carry on simple conversations on everyday life topics. Students will be introduced to cultural issues through class, extracurricular activities and multimedia programs. The elementary level is designed to help students learn to reflect and draw upon strategies used by good language learners in their second language study. 80-minute daily session.

82-141 Elementary Spanish I (12 units)
A course for beginning students emphasizing the development of communicative language proficiency: oral practice, aural comprehension, reading, writing, structural analysis, and language learning resource center work. It also involves studying cultural aspects of Spanish-speaking countries. If a student has studied Spanish before, then s/he must take a placement exam. 80-minute daily session.

82-171 Elementary Japanese I (12 units)
This course is the first part of a two-semester course sequence (82-171, 82-172) for students with no background in Japanese. It emphasizes the development of communicative language proficiency through oral practice, aural comprehension, reading, writing, and the study of cultural aspects of Japanese society. Furthermore, the elementary-level language course is designed to help students learn to reflect upon and draw upon strategies used by good language learners in their second language study. If a student has studied Japanese before, then s/he must take a placement exam. 80-minute daily session

The above language courses have no prerequisite. Additional Modern Language courses are available at the Elementary, Intermediate, and Advanced levels in French, Spanish, Japanese, Arabic, Chinese, and Italian. If interested, contact Dr. William Alba (alba@cmu.edu).

85-102 Introduction to Psychology (9 units)
Examines major areas of scientific psychology. The primary focus is on the areas of neural and motivational control of behavior, memory and thought, social interaction and psychological development. Specific topics within these areas include brain function, motivational control systems, cognitive and perceptual information processing, problem solving, obedience and conformity, emotion, how our social, cognitive and language functions develop, the importance
of childhood to adult functioning and psychopathology. Includes a small number of computerized laboratory experiments and experiences in which the student will perform experiments and analyze real data. 80-minute daily session.

**85-241 Social Psychology** (9 units)
The focus of this course will be on how people’s behaviors, feelings and thoughts are influenced or determined by their social environment. The course will begin with lectures and readings on how social psychologists go about studying social behavior. Next, various topics on which social psychologists have done research will be covered. These topics will include person perception, prejudice and discrimination, the nature of attitudes and how attitudes are formed and changed, interpersonal attraction, conformity, compliance, altruism, aggression, group behavior and applications of psychology to problems in health care, law, politics, and the environment. Through readings and lectures on these topics, students will also be exposed to social psychological theories. NOTE: Students without a prior course in Psychology should take the previous course, 85-102 (Introduction to Psychology). 80-minute daily session.

For an updated course list and schedule at the APEA Web site, see www.cmu.edu/enrollment/pre-college/apea.html

If you have any questions about your schedule, please contact:

**Dr. William Alba, APEA Director**
*Email: alba@cmu.edu*
*Phone: 412-268-7333 (campus extension 8-7333)*
*Office: Doherty Hall 2201*

Schedule changes may also be discussed upon your arrival on campus. Course changes become official only after discussion with Dr. Alba.

*The university reserves the right to change or cancel class times and/or course offerings without notice.*