

2017 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. APEA students are limited to enrolling in **23 or fewer units** because all courses in this six-week summer term cover material from the longer fall and spring semesters.

Students who do enroll in 23 units may be expected to study challenging Carnegie Mellon academic material for at least 57 hours every week. We instituted this policy in 2016 because we found students who enroll in excessive units cannot experience everything APEA has to offer. For more information, contact APEA Director Dr. William Alba (alba@cmu.edu, 412-268-7333) or Senior Academic Advisor Veronica Peet (vpeet@andrew.cmu.edu, 412-268-3750).

Newly listed courses for the APEA Program in 2017 include:

- 03-133 Neurobiology of Disease**
- 36-200 Reasoning with Data**
- 76-221 Books (By Women) You Should Have Read By Now**
- 79-104 Global Histories: Innovation and Social Change**
- 79-318 Sustainable Social Change: History and Practice***
- 80-276 Philosophy of Religion**

Visit <http://cmu.edu/shs/apea/2017Courses.pdf> 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 or Veronica Peet.

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 or Senior Academic Advisor about course choices, select your courses using the **APEA Course Request Form in the Pre-College Portal**. Students will have access to the form through the portal once they are admitted to APEA.

Courses fill in the order that deposits and forms are received by the university and the order that the course request form is completed.

To view your course schedule, visit Student Information Online on the HUB's website (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 5, 2017) by contacting the APEA Director or Senior Academic Advisor before arrival or by meeting one of them after the program begins. Students and their families are responsible for communicating to each other any changes in their academic plans.

*** Students enrolled in this class are eligible for an extended program beyond the 6-week APEA summer session connecting students from the course with ongoing student projects, mentoring, advising, and continued association with Carnegie Mellon Faculty and Staff.**

Units	Course#	Course Title	Meeting Times
9	03-121E	Modern Biology	MTWRF 09:00a-10:20a
9	03-124E	Modern Biology Laboratory	MW 12:00p-12:50p AND MW 01:00p-02:50p
9	03-133E	Neurobiology of Disease	MTWRF 09:00a-10:20a
3	09-101E	Introduction to Experimental Chemistry	M 01:30p-02:20p AND W 01:30p-04:20p
10	09-105E	Introduction to Modern Chemistry I	MTWRF 09:00a-10:20a
9	15-110E	Principles of Computing	MTWRF 09:00a-10:20a AND COURSE FULL MTWRF 04:30p-05:20p
12	*15-112E	Fundamentals of Programming and Computer Science	MTWRF 09:00a-10:20a AND MTWRF 05:30p-06:20p
10	*15-122E	Principles of Imperative Computation	MTWRF 10:30a-11:50a AND COURSE FULL MTWRF 03:00p-04:20p
12	18-100E	Introduction to Electrical and Computer Engineering	MTWRF 10:30a-11:50a AND MWF 03:00p-04:20p AND TR 01:30p-04:20p
10	21-120F	Differential and Integral Calculus	MTWRF 10:30a-11:50a COURSE FULL
10	21-127E	Concepts of Mathematics	MTWRF 09:00a-10:20a COURSE FULL
10	21-127F	Concepts of Mathematics	MTWRF 09:00a-10:20a COURSE FULL
9	21-259E	Calculus in Three Dimensions	MTWRF 09:00a-10:20a
9	27-052E	Introduction to NanoScience and Technology	MWF 01:00p-02:50p
9	33-115E	Physics for Future Presidents	MTWRF 03:00p-04:20p
9	33-124E	Introduction to Astronomy	MTWRF 01:30p-02:50p
12	33-141E	Physics I for Engineering Students	MTWRF 12:30p-02:50p
12	33-142E	Physics II for Engineering and Physics Students	MTWRF 09:30a-11:50a
9	36-200E	Reasoning with Data	MWF 12:00p-01:20p AND TR 12:00p-01:20p
9	36-201E	Statistical Reasoning and Practice	MTWRF 10:30a-11:50a AND TR 10:30a-11:50a
9	36-309E	Experimental Design for Behavioral and Social Sciences	MTWRF 10:30a-11:50a
9	57-341E	Sound Recording Workshop	MWF 01:30p-02:50p AND MW 06:30p-07:50p
9	70-122E	Introduction to Accounting	MTWRF 10:30a-11:50a
9	73-100E	Principles of Economics	MTWRF 01:30p-02:50p
9	73-230E	Intermediate Microeconomics	MTWRF 10:30a-11:50a
9	76-101E	Interpretation and Argument - Doctor Who? Social Justice and Public Health	MTWRF 12:00p-01:20p
9	76-101F	Interpretation and Argument - Video Games and Society	MTWRF 01:30p-02:50p
9	76-221E	Books (By Women) You Should Have Read By Now	MWF 09:00a-11:20a
9	79-104E	Global Histories - Civil Rights Movement and the World	MTWRF 12:00p-01:20p
9	79-201E	Introduction to Anthropology	MTWRF 10:30a-11:50a
9	79-318E	Sustainable Social Change: History and Practice	MWF 12:00p-1:20p
9	80-100E	Introduction to Philosophy	MTWRF 12:00p-01:20p
9	80-130E	Introduction to Ethics	MTWRF 12:00p-01:20p
9	80-276E	Philosophy of Religion	MTWRF 10:30a-11:50a
12	82-101E	Elementary French I	MTWRF 09:00a-10:20a
12	82-131E	Elementary Chinese I	MTWRF 10:30a-11:50a
12	82-171E	Elementary Japanese I	MTWRF 09:00a-10:20a
9	82-273E	Introduction to Japanese Language and Culture	MTWRF 09:00a-10:20a
9	85-102E	Introduction to Psychology	MTWRF 12:00p-01:20p
9	85-241E	Social Psychology	MTWRF 01:30p-02:50p

* Placement into 15-112 and 15-122 requires appropriate scoring on the CS Placement test. Details are in course descriptions.

03-121 Modern Biology (9 units)

This is an introductory course 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. 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 and 03-230. 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.

03-133 Neurobiology of Disease (9 units)

This course will explore the biological basis of several neurological and neuropsychiatric diseases, with an emphasis on medical diagnostic tools and techniques. It will include discussions of the anatomical basis of neurological diseases as well as recent research into understanding the mechanisms of disease. This course is intended to broaden students' understanding of how diseases are diagnosed and studied. Students will also learn how basic neurological and psychiatric evaluations are conducted and gain proficiency in these evaluation techniques. We will begin with a discussion of clinical neuroanatomy to serve as a basis for understanding brain structures and functional alterations in a variety of developmental, degenerative, neurological, and psychiatric disorders. Specific diseases covered may vary from year to year. 80-minute daily lecture.

09-101 Introduction to Experimental Chemistry (3 units)

This is a seven week chemistry laboratory course that is designed to introduce students to some basic laboratory skills, techniques, and equipment commonly used in experimental chemical investigations. The experiments will apply concepts in organic synthesis, quantitative analysis using visible spectrophotometry, kinetics, acid-base chemistry, thermochemistry, transition metal chemistry, chromatography, and protein biochemistry. The course is offered at no additional tuition charge to students enrolled in APEA. There is a \$50 lab fee for materials and supplies. 50-minute weekly lecture and 3-hour weekly laboratory.

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, intermolecular interactions 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. 80-minute daily lecture.

15-110 Principles of Computing (10 units)

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 50-minute daily recitation.

15-112 Fundamentals of Programming and Computer Science (12 units)

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 more gentle introduction to computer science should consider first taking 15-110. **NOTE:** students must achieve a C or better in order to use this course to satisfy the pre-requisite for any subsequent Computer Science course. 80-minute daily lecture and 50-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 devote 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.

Computer Science Placement Exam: To ensure students are placed in the correct CS courses, APEA students who seek to enroll in 15-112 or in 15-122 must complete a CS placement exam administered by CMU. Information about this exam will be sent to students who have listed 15-112 or 15-122 on their online course request forms. Students will be enrolled in these courses only after their placement exams are scored.

15-122 Principles of Imperative Computation (10 units)

For students with a basic understanding of programming (variables, expressions, loops, arrays, functions). 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. This course prepares students for 15-213 and 15-210. **NOTE:** students must achieve a C or better in order to use this course to satisfy the pre-requisite for any subsequent Computer Science course. Prerequisites: 15-112 or equivalent (such as a 5 on the AP Computer Science exam). **All students enrolled in 15-122 must have completed 21-127 (Concepts of Mathematics) previously, or be enrolled in 21-127 this summer.** 80-minute daily lecture and 80-minute daily recitation.

Computer Science Placement Exam: To ensure students are placed in the correct CS courses, APEA students who seek to enroll in 15-112 or in 15-122 must complete a CS placement exam administered by CMU. Information about this exam will be sent to students who have listed 15-112 or 15-122 on their online course request forms. Students will be enrolled in these courses only after their placement exams are scored.

18-100 Introduction to Electrical and Computer Engineering (12 units)

The goals of this freshman engineering course are: To introduce basic concepts in electrical and computer engineering in an integrated manner; To motivate basic concepts in the context of real applications; To illustrate a logical way of thinking about problems and their solutions, and; To convey the excitement of the profession. These goals are attained through analysis, construction and testing of an electromechanical system (e.g., a robot) that incorporates concepts from a broad range of areas within Electrical and Computer Engineering. Some of the specific topics that will be covered include system decomposition, ideal and real sources, Kirchhoff's Current and Voltage Laws, Ohm's Law, piecewise linear modeling of nonlinear circuit elements, Ideal Op-Amp characteristics, combinational logic circuits, Karnaugh Maps, Flip-Flops, sequential logic circuits, and finite state machines. 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)

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, inverse functions, definite and indefinite integrals, and hyperbolic functions; applications of integration, integration by substitution and by parts. Contact the APEA Director or Advisor 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 a different mathematic course. 80-minute daily lecture.

21-127 Concepts of Mathematics (10 units)

This course introduces the basic concepts, ideas and tools involved in doing mathematics. As such, its main focus is on presenting informal logic, and the methods of mathematical proof. These subjects are closely related to the application of mathematics in many areas, particularly computer science. Topics discussed include a basic introduction to elementary number theory, induction, the algebra of sets, relations, equivalence relations, congruences, partitions, and functions, including injections, surjections, and bijections. A basic introduction to the real numbers, rational and irrational numbers. Supremum and infimum of a set. 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, a 5 on the AP Calculus BC exam, or equivalent coursework. This course is the third main calculus course at Carnegie Mellon. 80-minute daily lecture.

27-052 Introduction to NanoScience and Technology (9 units)

This course is offered within Carnegie Mellon's Advanced Placement Early Admissions (APEA) program. The course is primarily intended to provide an introduction to nanoscience and technology to a wide audience of students at the advanced high school to incoming freshmen level. The course goals are twofold: (1) to provide students with a holistic view of the objectives, opportunities and challenges of the emerging field of nanotechnology and 2) to sensitize students at an early stage of their career to the relevance of the connections among the traditional disciplines as a vital element to the progress in interdisciplinary areas such as nanotechnology. The course will cover: Introduction and fundamental science; Preparation of nanostructures; Characterization of nanostructures; Application examples, Social and ethical aspects of nanotechnology. Admission according to APEA guidelines. 110-minute meetings three times per week.

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. The course is open for all students at CMU. 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.

33-141 Physics I for Engineering Students (12 units)

This is a first semester, calculus-based introductory physics course. Basic principles of mechanics and thermodynamics are developed. Topics include vectors, displacement, velocity, acceleration, force, equilibrium, mass, Newton's laws, gravitation, work, energy, momentum, impulse, torque and angular momentum, temperature, heat, equations of state, thermodynamic processes, heat engines, refrigerators, first and second laws of thermodynamics, and the kinetic theory of gases. Prerequisites: high school calculus course, concurrent enrollment in 21-120, or a 5 on the AP AB Calculus exam. 80-minute daily lecture and 80-minute daily recitation.

33-142 Physics II for Engineering and Physics Students (12 units)

This is the second half of a two-semester calculus-based introductory physics sequence for engineering and physics students. Two fifths of the course covers electricity, including electrostatics and electric fields, Gauss' law, electric potential, and simple circuits. Two fifths cover magnetism, including magnetic forces, magnetic fields, induction and electromagnetic radiation. One fifth of the course covers mechanical waves (including standing and traveling waves, superposition, and beats) and electromagnetic waves (including mode of propagation, speed, and other properties). Prerequisites: A score of 5 on the AP AB or BC Calculus exams. Completion of a physics course in mechanics or equivalent course in high school (5 in AP Physics C: Mechanics) is required. 80-minute daily lecture and 80-minute daily recitation.

36-200 Reasoning with Data (9 units)

This course will serve as an introduction to learning how to "reason with data". While still an introductory-level course in the Statistics Department, the focus will be more on thinking about the relationship between the application and the data set and extracting useful statistical information rather than taking primarily a formula-driven approach. There will be an emphasis on thinking through an empirical research problem from beginning to end. Types of data will include continuous and categorical variables, images, text, and networks. Applications will largely be drawn from interdisciplinary case studies spanning the humanities, social sciences, and related fields. Methodological topics will include basic exploratory data analysis, elementary probability, hypothesis tests, and empirical research methods. There is no calculus or programming requirement. There will be weekly computer labs for additional hands-on practice. 80-minute daily lecture.

36-201 Statistical Reasoning and Practice (9 units)

This course will introduce students to the basic concepts, logic, and issues involved in statistical reasoning, as well as basic statistical methods used to analyze data and evaluate studies. The major topics to be covered include methods for exploratory data analysis, an introduction to research methods, elementary probability, and methods for statistical inference. The objectives of this course are to help students develop a critical approach to the evaluation of study designs, data and results, and to develop skills in the application of basic statistical methods in empirical research. An important feature of the course will be the use of the computer to facilitate the understanding of important statistical ideas and for the implementation of data analysis. In addition to three lectures a week, students will attend a computer lab once a week. Examples will be drawn from areas of applications of particular interest to H&SS students. Not open to students who have received credit for 36-207/70-207, 36-220, 36-225, 36-625, or 36-247. 80-minute daily lecture.

36-309 Experimental Design for Behavioral and Social Sciences (9 units)

Statistical aspects of the design and analysis of planned experiments are studied in this course. A clear statement of the experimental factors will be emphasized. The design aspect will concentrate on choice of models, sample size and order of experimentation. The analysis phase will cover data collection and computation, especially analysis of variance and will stress the interpretation of results. 80-minute session four days a week.

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.

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 to 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)

The course is, literally, an introduction to economic principles. Its main goal is to give students an understanding of what constitutes good "economic thinking". The first part of the course focuses on microeconomic analysis including, consumer and seller incentives, trade, public goods, monopoly, game theory, and theory of auctions. The second part of the course introduces a fascinating subject of macroeconomics that seeks to understand why some countries are rich and others poor, why countries experience phases of expansion and contraction, where inflation comes from, the scope for government to accelerate economic growth and restrain price inflation. Overall, the course provides the fundamental methods to reason about major economic problems faced by the United States and other countries. 80-minute daily session.

73-230 Intermediate Microeconomics (9 units)

This course is a calculus-based study of microeconomics. Topics in partial equilibrium analysis include supply and demand, consumer theory, theory of the firm, profit maximizing behavior, monopoly theory, and perfect competition. The course concludes with an introduction to general equilibrium analysis and the welfare laws. Prerequisite: 73100 (AP Scores of 5 on Microeconomics and Macroeconomics.)

76-101 Interpretation and Argument (9 units)

76-101 introduces first-year students to an advanced, inductive process for writing an argument from sources. Because the course is based upon empirical research about professional academic writers, students will learn expert practices for authoring their own arguments that contribute to an existing community of authors. Because reading and writing are inseparable practices for academic writing, students will read a variety of texts so that they can explore and critically evaluate a single issue from multiple perspectives and from different disciplinary genres. Students will learn methods for summarizing, synthesizing, and analyzing arguments within that issue so that they may contribute an argument of their own. The course is also geared toward helping students understand the requirements of advanced college-level writing. Our students are typically very accomplished readers and writers, and we are eager to push their accomplishments toward greater excellence. For this purpose, students will build upon their composing knowledge by reflecting and thinking strategically as they plan, write, and revise their own texts. Ultimately, they will develop critical reading, rhetorical and linguistic practices for analyzing and producing texts within the context of an academic community. Each section of 76-101 is structured by the same objectives and core assignments. There is a core vocabulary and set of heuristics that all sections teach. 80-minute daily session.

Section E: *Doctor Who? Social Justice and Public Health*

As we anticipate Trump's White House, a matter of paramount concern is the state of public health care in the United States. During his campaign, Trump pledged to repeal the Affordable Care Act (commonly referred to as Obamacare), claiming that it results from unilateral party politics as well as places an undue burden on an individual's self-determination. Trump's comments are but the latest in a century-long debate concerning the legitimacy of government intervention within the domain of public health. Beginning in 1905, when the United States Supreme Court ruled in *Jacobson v Massachusetts* that states had the authority to enforce mandatory vaccinations when "necessary for public health or safety," we have witnessed increases in public health legislation and policy, which have spurred controversies surrounding the ramifications of government-regulated health initiatives. For some, public health policies are a matter of social justice, representing a way to prevent millions of unnecessary deaths and build stronger, healthier communities. For others, these policies point to gross intrusions on individual liberties and freedoms. Others still claim that in their attempts to be universal, public health policies often neglect the unique sociocultural conditions that influence a community's health practices. This section of 76-101 examines the controversies surrounding public health by tracing possible moral, ethical, and sociopolitical implications of public health policies. Through critically examining popular and academic texts regarding government-lead health initiatives, students will learn and practice the analytical skills necessary to understand and responsibly contribute to this complex social issue, which affects every one of us.

By the time students complete this course, they will be able to analyze the rhetorical structure of multifaceted arguments; synthesize the major perspectives regarding the course topic; and, finally, contribute to the on-going academic conversation by researching and/or analyzing a public health policy of their choosing. Along with acquiring a robust understanding of the course content, students will end the semester with an inventory of strategies for constructing persuasive, authoritative, and reader-friendly prose.

Section F: *Video Games and Society*

In 2014, a series of events now referred to as Gamergate revealed widespread misogyny throughout the larger male-dominated gaming community. Initially debating the ethics of video game journalists, the conversation became loaded with violent threats and the defamation of female video game developers. While the outcome of

Gamergate is still hotly debated in relation to the parties involved, one thing was made clear: video games are no longer a niche interest. With over half of the American population reported to play video games, they now outsell the global box office, making video games a new dominant form of media. The virtual societies of video games enable us to participate in experiences difficult to capture through other means, while also paralleling real world power structures and prejudices. How can we understand video games as tools for social change? How does a post-Gamergate gaming community move forward without abandoning the work of the past? How do we define video games? In terms of goals, interaction, or technology? The goal of this class is to investigate these questions surrounding video games, while also considering issues of race, gender, and sexual orientation in relation to the history of video games. The course requires no previous knowledge of or experience with video games, and some assignments will include playing relevant games that highlight the issues we'll be discussing in our readings. We will read various articles addressing the sociological issues of games, and students will be asked to write their own papers analyzing, critiquing, and synthesizing these perspectives, leading to a final paper where they will craft their own contribution on how we can understand video games as tools for sociological reflection and progress.

76-221 Books (By Women) You Should Have Read By Now (9 units)

In this course, we will explore several works of literature by women writers that everyone should read in their lifetime. Some of these works, like Jane Austen's *Pride and Prejudice* and Daphne Du Maurier's *Rebecca*, have been some of the most commercially successful novels of all time. Others, like Mary Shelley's *Frankenstein*, helped create entire genres of fiction. Still others, like Harper Lee's *To Kill A Mockingbird*, are amongst the most controversial and banned works ever written. As we read, we will discuss: what is the "literary canon" how does it relate to cultural capital? In what ways have women writers influenced literary and cultural production? In what ways can these vibrant texts engage with important issues of their (and our) time, like gender, race, sexuality, nationality and class? Instructor lectures will additionally introduce other cultural and historical materials like visual arts, periodicals, music, film, letters, and secondary criticism in order to enhance students' experiences with these literary works by women. 140 minute session three times per week.

79-104 Global Histories – The Civil Rights Movement and the World (9 units)

Human activity transcends political, geographical, and cultural boundaries. From wars to social movements, technological innovations to environmental changes, our world has long been an interconnected one. Acquiring the ability to understand such transnational and even worldwide processes is an indispensable part of any college education. This course provides students with an opportunity to develop the skills and perspectives needed to understand the contemporary world through investigating its global history and is designed to help students: (1) master knowledge through interaction with the instructors, reading material, and other students, (2) think critically about the context and purpose of any given information, (3) craft effective verbal and written arguments by combining evidence, logic, and creativity, and (4) appreciate the relevance of the past in the present and future. 80-minute daily session.

79-201 Introduction to Anthropology (9 units)

Cultural anthropologists "make the strange familiar and the familiar strange," attempting to understand the internal logic of cultures which might, at first glance, seem bizarre to us, while at the same time probing those aspects of our own society which might appear equally bizarre to outsiders. In doing so, anthropology makes us more aware of our own culturally-ingrained assumptions, while broadening our understanding of the possibilities and alternatives in human experience. This course will use ethnographic writings (descriptive accounts of particular cultures), as well as ethnographic films, to investigate the ways in which diverse societies structure family life, resolve conflict, construct gender relations, organize subsistence, etc. We will assess the advantages and pitfalls of comparing cross-cultural data, analyze the workings of power within and between societies, and consider the politics of cultural representations. We will also discuss the anthropologist's relationship to the people s/he studies, and the responsibilities inherent in that relationship. Throughout the course, students will learn the importance of an historical perspective on culture, looking

at how and why societies change, and considering how we, as anthropologists, should assess these changes. 80-minute daily session.

79-318 Sustainable Social Change: History and Practice (9 units)

If you wanted to change the world, who would you ask for guidance? Mahatma Gandhi, Martin Luther King, Mother Theresa, Rachel Carson, or Nelson Mandela? In this interdisciplinary course, we will examine the history of efforts to create sustainable social change. Through a series of targeted case studies, we will examine the successes and failures of notable leaders, past and present, who strove to address social problems nonviolently and to create lasting improvements in fields such as education, healthcare, and human rights. In keeping with the example of the people we will be studying, we will bring our questions and our findings out of the classroom through a variety of creative, student-driven experiments in sustainable social change. 80-minute daily session. **Students enrolled in this class are eligible for an extended program beyond the 6-week APEA summer session connecting students from the course with ongoing student projects, mentoring, advising, and continued association with Carnegie Mellon Faculty and Staff.**

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 rising 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, homeworks 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 its strengths, whether such weaknesses can be resolved and, if they cannot be resolved, why. 80-minute daily session.

80-130 Introduction to Ethics (9 units)

As human beings, we frequently grapple with difficult moral questions. How ought I treat my friends and peers? What kinds of policies should a government adopt? When, if ever, can we justify harm? These are the kinds of questions we will consider as we survey the most prominent, contemporary ethical theories. Along the way, we will consider the implications of those theories for real world ethical issues, including capital punishment, pornography, and universalized healthcare. 80-minute daily session.

80-276 Philosophy of Religion (9 units)

In order to expand our ideas about what religion could be, the course begins with a brief cross-cultural review of some major religious traditions around the world. Then we turn to some more traditional arguments for and against theism, including the ontological, cosmological, and design arguments, the argument from religious experience, the argument from miracles and historical testimony, and the problem of evil. We will also consider whether morality ultimately depends on God's sanctions and (yes, here it is at Carnegie Mellon) whether life would be meaningless if God did not exist. 80-minute daily session.

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

82-101 Elementary French I (9 units)

This course is for students with no prior experience in French. Using a proficiency-oriented approach, students will develop contextually appropriate interpersonal communication skills in both written and spoken French, develop reading and listening skills through the use of various media, understand fundamental grammar, acquire vocabulary, and

gain a basic understanding of French and francophone cultures through class activities. Regular homework, quizzes, tests, presentations, and class participation are mandatory (four in-class hours per week). The elementary level is also designed to help students learn to reflect and draw upon strategies used by good language learners in their second language study. A student with prior experience in French must take the placement exam. 80-minute daily session.

82-131 Elementary Chinese I (12 units)

This course is for students with no prior experience in Chinese. Using a proficiency-oriented approach, students will develop contextually appropriate interpersonal communication skills in both written and spoken Chinese, develop reading and listening skills through various media, understand fundamental grammar, acquire vocabulary, and gain a basic understanding of Chinese cultures through class and extracurricular activities. Regular homework, quizzes, tests, and participation in class are mandatory (four in-class hours per week). Students will learn the phonetic transcriptions of Chinese (Pinyin) for speaking and listening as well as Chinese characters for reading and writing. The elementary level is also designed to help students learn to reflect and draw upon strategies used by good language learners in their second language study. A student with prior experience in Chinese must take the 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 prior experience 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. Regular homework, quizzes, tests, presentations, and class participation are mandatory (four in-class hours per week). The elementary level is also designed to help students learn to reflect and draw upon strategies used by good language learners in their second language study. A student with prior experience in Japanese must take the placement exam. 80-minute daily session

82-273 Introduction to Japanese Language and Culture (9 units)

This course is an introduction to modern Japanese. Given the close link between the Japanese language and culture, the examination of the distinctive characteristics of the Japanese language and its sociocultural context provides important insights into contemporary Japan. This course is taught in English and is intended both for individuals who want to gain a better understanding of modern Japanese society, as well as for students of the Japanese language. 80-minute daily session.

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

85-102 Introduction to Psychology (9 units)

This course examines major areas of scientific psychology in some depth, the attempt being to develop basic models of our behavior and thought that explain wide areas of our functioning. 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, learning, cognitive and perceptual information processing, problem solving, obedience and conformity, social interaction, emotion, attitude consistency and change, how our social, cognitive and language functions develop, the importance of childhood to adult functioning, and psychopathology. In addition to the lecture, the course includes a weekly recitation section meeting and weekly short WEB-based laboratory experiences in which students get to perform actual experiments, interpret real data, and experience many psychological phenomena. 80-minute daily session.

85-241 Social Psychology (9 units)

The focus of this course will be on how peoples behavior, 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. 80-minute daily session.

For the most recent updates to this course list and schedule, see:

<http://cmu.edu/shs/apea/2017Courses.pdf>

This is a course list is dated 6-2-2017. Updates reflected in course list schedule reflected on page 2:

Course time change:

36-309 Experimental Design for Behavioral and Social Sciences MTWRF (Updated 3-13-17)

79-318E Sustainable Social Change: History and Practice MWF 12:00p-1:20p (Updated 3-27-17)

Course Title Change:

79-104 Global Histories – The Civil Rights Movement and the World (Updated 3-27-17)

Course Deleted:

80-205E Introduction to Rational Choice (Updated 3-27-17)

79-392E History of Modern Warfare (Updated 4-11-17)

Course Full:

15-110E Principles of Computing (Updated 6-5-17)

15122E Principles of Imperative Computation (Updated 6-5-17)

21-120 Differential and Integral Calculus (Updated 6-5-17)

21-127E, 21127F Concepts of Mathematics (Updated 6-5-17)

If you have questions about scheduling, please contact:

Dr. William Alba, APEA Director

Email: alba@cmu.edu

Phone: 412-268-7333 (campus extension 8-7333)

Office: Doherty Hall 2201

Carnegie Mellon University, 5000 Forbes Ave.

Mellon College of Science, 1324 Doherty Hall

Pittsburgh, PA 15213

OR

Ms. Veronica Peet, APEA Senior Academic Advisor

Email: vpeet@andrew.cmu.edu

Phone: 412-268-3750 (campus extension 8-3750)

Office: Wean Hall 6814

Carnegie Mellon University, 5000 Forbes Ave.

Mellon College of Science, 1324 Doherty Hall

Pittsburgh, PA 15213

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

After being accepted to the APEA program, you will be enrolled in courses only after you confirm your attendance.

APEA students are enrolled in courses after the university processes your enrollment forms and deposit, and after the APEA Program receives your **APEA Course Request Form in the Pre-College Portal**.

In addition, students seeking to enroll in 15-112 or 15-122 must have their CMU CS placement exams completed and scored.

Students will be enrolled in courses beginning on March 22, 2017, in the order that the above information is received.

The APEA Program will contact you if any courses that you requested are filled.

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