ME 104Q The Engineering of Bridges
An introduction to the art of bridge building based on the study of the engineering and technological problems involved in the design, construction, and collapse of bridges from antiquity to the present time. The course includes several case studies of major historical bridges selected for their structural significance. Students learn how to calculate the forces acting on structural elements, how these forces depend on the bridge structural form, how the form itself is conditioned by the structural materials, and how forces are measured with electromechanical instrumentation. The study includes fundamental notions of mechanics, strength of materials, structural behavior, instrumentation failure analysis, and design optimization. Working on teams, students use constructive experimental models as well as computer-aided programs to design, build, instrument, and test realistic bridge projects. This is a self-contained course open to all Rochester undergraduates.
Note: Freshman enrollment is encouraged but also open to ATHS upper classmen.

ME 106 Engineering in Antiquity
Application of engineering principles and technology to the design and performance of engineering structures from antiquity to the pre-industrial world. Engineering principles (transfer of forces, momentum, and energy), study of primary texts (in translation), and examination of existing structures/monuments. Primary texts include selections from Aristotle’s Mechanical Problems, Vitruvius’ Ten Books on Architecture, Leonardo’s Notebooks, Galileo’s Dialogues on Two New Sciences. Emphasis on engineering design of engineered structures from the Bronze Age to the 18th century. Topics: Evolution of engineered materials (metals, wood, stone, marble, concrete, composites) and limitations; Bronze Age fortifications; Structural design of Greek temples; Roman aqueducts, siphons, and vaults; Force, power and energy sources and transmission; Failure of materials; Lifting devices; Construction engineering; Columns, beams, vaults, trusses, frames; Instruments of warfare. Open to all undergraduates. No prerequisites.

AH 107 Ancient Architecture
This offering introduces architecture of the ancient world with a focus on Egypt, Mesopotamia, the Bronze Age Aegean, Greece and Rome. Of particular interest is the creation and development of urbanism in which spaces and buildings are expressions of political, social, economic and religious aspects of the cultures. Due consideration will be made of the environment as a source not only of materials (and their construction techniques), but also relating to the meaning of buildings and the world view of the cultures.

AH 243 Architecture of the Classical World
The architecture of Greece and Rome is fundamental to our understanding of the heritage of the West. We will trace the origin and development of building types in Greece: the temple and its sacred area, buildings of public cultural use such as theaters and the invention of town planning. The development of Roman architecture will also be examined for its sources and meaning, considering local Italic traditions, Etruscan and Greek. In addition to determining the meaning of architectural forms, two major themes will be followed: the spatial aspect of planning and building and the inventiveness of Roman constructional practices.

CLA 220 Classical Archaeology: Greek Art and Archaeology
This course examines the physical remains of ancient Greek civilization, with an emphasis on architecture, sculpture, painting, and other visual arts, in order to understand Greek culture and society. Covering a span of time from roughly the third millennium BC through the first century BC, we will first look at the eastern Mediterranean area in the Bronze Age; we will then trace the development over time of art and architecture in the Greek world, including mainland Greece and the Greek islands, Asia Minor, and Sicily and southern Italy, through study of some of the most important artworks and monuments of western civilization, such as Greek red- and black-figure vases, the Parthenon in Athens, and the sculptures of Polykleitos, Praxiteles, and Lysippos.

CLA 221 Classical Archaeology: Roman Art and Archaeology
This course examines the physical remains of ancient Roman civilization, with an emphasis on architecture, sculpture, painting, and other visual arts, in order to understand Roman culture and society. Covering a span of time from the ninth century BC through the fifth century AD, we will first look at the Etruscan background to Roman civilization; we will then trace the development of art and architecture in the city of Rome, with a particular emphasis
on the monuments in the city during the period in which Rome was the capital of a vast empire. Along the way, we will also examine evidence from other sites around the Roman Empire, such as Ostia, Pompeii, and Constantinople.

**CORE COURSES**

**ME 107 Mechanics and Optics in Antiquity**
The basic principles of mechanics and optics as they developed in ancient Greece, Rome, China and Europe and the emergence of mechanics and optics prior to the industrial revolution. Examples: Law of the lever (Aristotle and Archimedes); Center of gravity (Archimedes and Galileo); Gears, metalworking, and the Antikythera mechanism; Hellenistic science; Medieval mechanics and optics; Mechanical designs of Leonardo da Vinci; Development of glass-making, eyeglasses, the telescope (Galileo, Kepler, Newton); Lens grinding and polishing; Dynamics and strength of materials (Galileo); The emergence of mechanics (Newton) and optics (Kepler). The course includes basic mechanics and optics; study of texts (in English translation); and study of artifacts and archaeological and historical discoveries. Open to all undergraduates. No prerequisites.

**ME 108 Engineering and Architectural Heritage**
The aim of this course is to present the role of engineering in the evolution of architectural heritage. The course examines, from the engineering point of view, the cultures in the world. In this course a brief review of basic concepts of structural engineering will be given. A general overview of diagnosis and monitoring tools will be shown including the respective techniques and data processing tools. Finally, the concepts shown in the course will be used for carrying out a general evaluation of a specific case study. (Taught by visiting faculty member F2014)

**CLA 204 Engineering and Society in Classical Antiquity**
This course explores the relationship between, on the one hand, engineering and technological advances and, on the other hand, social practices in ancient Greece and Rome. Topics covered include the social role of engineers and architects, the ancient economy and work force, and the social use of buildings and other constructions in the Greek and Roman worlds.

**ME 206 Building Engineering and Technology**
We study the engineering and technological problems involved in the design, construction, maintenance, and collapse of major buildings (such as temples, theaters, baths, bridges and cathedrals) from antiquity to the pre-industrial world. The course draws material from case studies of relevant monuments primarily from Classical Rome and Greece, and the Middle Ages. Topics: review of statics and strength of materials; building materials; mechanics of block structures: walls, columns, trabeated systems; masonry arches; structural elements: beams, frames, trusses; timber frames and roofing systems; vaults and domes; construction machines. Requirements: homework sets, term project, two midterm exams. The course is appropriate for students in the humanities and the social sciences as well as in engineering. Prerequisites: either ME104Q or ME106, or permission of the instructor

**ME 207 Roman Structures: Building the Imperial City**
We study the engineering and technology in Roman Imperial times as related to building design, construction, and maintenance of large-scale projects in the city of Rome. The course begins with a mandatory study-on-location component in Italy in the summer. Topics: forces, materials, and structural design; Republican Forum; Imperial Forums; temples; Basilica Ulpia; Constantinian basilicas; Markets of Trajan; theaters; Flavian amphitheater; Imperial palaces on the Palatine; Circus maximus, Domus Aurea, Pantheon, Hadrian Villa at Tivoli; Baths of Caracalla; Baths of Diocletian; Basilica of Maxentius, Aurelian walls and city gates; bridges on the Tiber; roads; Ostia antica and the residential insula; Portus and its artificial harbors; aqueducts of Rome. ME106 Engineering in Antiquity is recommended but not required. The course is appropriate for students in the humanities and the social sciences as well as in engineering.

**ME 208 Structural Dynamic and Instrumentation on Architectural Heritage Buildings**
The course aims at giving to the student advanced concepts of structural dynamics in the context of architectural heritage buildings applications. The course starts with general concepts of classical dynamics for single and multi degree of freedom systems. Then, general topics related to instrumentation and then measurement of static and dynamic parameters are treated in detail. Finally, the issues related to machinery vibration and experimental modal analyses of architectural heritage buildings are presented. (Taught by visiting faculty member F2014)
AH 106 Introduction to Archaeology
This course introduces the student to the field of archaeology through three units of study: 1) The history of excavation from ancient to modern times, 2) The techniques of excavation and the analysis of material remains, 3) Modern theories of cultural interpretation of archaeological sites. We will discuss the value of archaeological approaches to the fields of anthropology, history, architectural and art history, religious and classical studies. Much of the instruction will be illustrated by case studies of sites; although the view will be global, there will be a concentration in Old World material from prehistory to the early modern period. Students will be required to write three essays, with subjects selected from each of the three course units.

HIS 280 Archaeology of Early America
This course introduces students to historical archaeology and uses archaeological sites, material culture, and architecture to investigate European colonization of the Americas. Topics include Euro-Indian contact, the transfer of European and African cultures to American shores, creolization and the emergence of distinctly American traditions, Atlantic connections, and how non-documentary sources help us understand the lives of African-Americans, Indians, and white settlers.

HIS 285 Digital History: The Virtual St. George’s Project
Students will conduct guided research using a variety of software and historical sources to help create a Virtual Digital St. George’s – a 400-year-old town with approximately 250 properties and historic buildings. We will build multi-layer 2D and selective 3D computer models of the oldest town in English America (founded 1612). Work will include integrating different types of historical data into Excel or ArcGIS databases, independent research on specific buildings and property owners using digital newspaper archives, “building” individual 3D houses within the town using Sketch-Up, Maya, or Revit, reconstructing and furnishing historic house interiors using interior design software. Students with computer programming experience may develop mini-games or mobile devise apps to educate modern visitors to the town.

HIS 299/499 Field and Research Methods
Using Smiths Island, Bermuda, as a historical laboratory, this course trains students in archival research and archaeological survey, excavation, and lab analysis techniques and prepares them for professional work as historical archaeologists. Students will also learn about Bermudian and Atlantic historical developments, trade relations, and slavery and the African diaspora since 1610. Participants will also be introduced to archaeological conservation, museum studies, and underwater archaeological techniques. No prior archaeology experience is necessary.

AH 114 Creating Architecture
Architecture gives form to space. It is a specialized, functional art that defines space for a utilitarian purpose, based on a specific set of conditions. Architecture makes music out of notes, poetry out of words it elicits a response. This course will explore the fundamental design principles that are the tools used to create architecture. Through a series of talks, images, field trips, the students will gain a new awareness of a building, an outdoor space or an entire city. The students will become more sensitive to both the natural and built environment through this increased understanding of architecture. This course is intended to be very interactive and therefore enrollment will be limited to 10 students. Students will be evaluated on two papers and a final project. This course is open to all majors, and prior architecture study is not required.

AH 150 Introduction to Architecture
The lectures and readings of this course introduce many approaches to the study of architecture. We will explore the meaning of building in its cultural and environmental context and will consider the specifics of aesthetics, materials, and structure, using a selection of works from prehistoric to modern times. Emphasis will be placed on experiencing architecture through real, reconstructed and imaginary buildings.

AH 188 Cities and Architecture in Pre-Columbian Mesoamerica and the Andes
Both Mesoamerica and the central Andean region constitute cultural centers indispensable to the understanding of the development of civilization in the Americas since pre-hispanic times. The study of these areas necessitates a variety of approaches from the social, artistic and technological perspectives. This course will focus on the architectural and urbanistic aspects, as expressions of not only pragmatic and physical resolution of needs but also as remarkable ways to manifest the relation of these ancient people to their lands and to their world view: in Mesoamerica from the Olmecs to the Maya and the Aztecs, and in the Andes from the earliest settlements of the continent to great societies and empires such as the Moche, Wari, Chimú and Inca. This region will be the core of
the studies of the course. Students will familiarize with the chronology of the Mesoamerican and Andean regions, the territorial modifications and urbanistic control that the ancient societies had over the land, the various and defined types of architecture and the evolution of local construction technologies and materials, the stylistic and symbolic particularities of that architecture and its role in the history and cultural development of such societies.

**AH 240 British Art of the Middle Ages**
A survey of art of the Middle Ages in England from the end of Roman occupation to the Tudor period. The course is designed to give the student a basic introduction to the uniqueness and variety of English art and architecture seen in historical perspective and in relation to parallel continental achievements.

**AH 245 Architecture in the High Middle Ages**
This course introduces the architecture of Western Europe from the eleventh to the fifteenth century. Building of this era is usually divided into two principal phases, Romanesque and Gothic. While there are numerous regional and chronological variations during these centuries, many instances of exchange across Europe and exotic influences through cross cultural contact, the course stresses the pan-European development of structural and aesthetic inventiveness and the extraordinary relation between form and content in buildings, whether churches, monastic communities, houses or castles. All of the works are examined against the changing values of cultures which constitute the transformation of the West.

**ANT 253/HIS 217 – Prehistory of Ancient Peru: The Incas and their Ancestors**
The central Andes constitute one of the cradles of ancient civilization. Archaeologists and historians have studied the cultural development of Pre-Hispanic societies, including the Incas and their ancestors. This course reviews the prehistory of Ancient Peru, a core area of the central Andes, focusing on its most remarkable processes of cultural evolution throughout thousands of years of human adaptation to harsh environments and social pressures. Students will familiarize with Andean chronologies, the great achievements of Pre-Hispanic societies regarding their artistic and technological manifestations, emphasizing on their social and political role in their own historical context.

**ANT 254/ HIS 218/REL 250- Religion and Power in the Andes**
An overview of an anthropological and archaeological perspective about religion and rituals related to religious practices as well as an examination of their entrenched relation with the dynamics of power and the formation of complex social and political organizations in Pre-Hispanic Andean civilization. The course explores the material expressions of rituals and religious experience manifested in Inca and Pre-Inca societies, especially those related to the construction of monumental buildings with a ritual function, the use of diverse materials such as fibers, clays and metals in the production of sumptuary goods for ritual offerings, the practice of human and animal sacrifice, the performance of public elite mortuary rituals and the ancestor cult.

**CLA 214 The Ancient City**
This course examines the phenomenon of urbanism in the ancient Mediterranean world. After a brief consideration of the rise of cities in the Near East and Egypt, the course focuses on the cities and colonies of ancient Greece and of the Roman Empire, with special attention devoted to Athens and Rome. Topics covered include town planning, public and private spaces and building types, urban life, and colonization, as seen through the archaeological remains of cities located around the Mediterranean basin and beyond.

**CLA 222 Pompeii and the Bay of Naples**
The eruption of Mt. Vesuvius in AD 79 resulted in the extraordinary preservation of entire ancient Italian cities and towns around the Bay of Naples. In this class, we will learn about ancient society, economy, religion, art, architecture and urbanism as seen through the remains of the city of Pompeii and other settlements around the Bay of Naples such as Baiae, Herculaneum and Stabiae.

**IT 223 / AH 226 / CLA 223 Monuments of Ancient Italy: History, Structure, Form (UR Arezzo Program – Fall semester)**
The course introduces the history and the architecture of buildings in Ancient Italy from the fifth century BC to the fourth century AD, examined through a multidisciplinary approach based on the archeological evidence, the technical and functional aspects, and the historical significance. Central to the course is the study on location of major monuments and archeological sites in central and southern Italy, including Rome, Ostia Antica, Pompeii, Herculaneum, Baiae, and Paestum. The course is divided into three parts: (1) structural engineering and technical issues, (2) the architecture of Etruscan Italy and Magna Grecia, and (3) Roman architecture.

**CLA 299 Field Methods of Archaeology (6 credit Summer Program in Torano, Italy)**
In this course, taught on site at an archaeological excavation, students receive instruction and hands-on training in archaeological field and laboratory work, including remote sensing in archaeology, on-site surveying, excavation techniques, field documentation, and artifact identification and processing. Students are also introduced, through lectures, readings, and field trips, to the archaeology of the region in which they are excavating, and they learn to apply this knowledge to the interpretation of the archaeological material they excavate.

**CORE 3 – HISTORY**

**CLA 102 Cultural History of Ancient Greece**
In this course we will survey the unique military, political, and economic history of ancient Greece from the Bronze Age to the death of Alexander the Great. In addition, and more unusually, we will look at ancient Greece’s rich cultural and social history.

**CLA 115 Roman World**
The course offers a comprehensive account of the history of Rome. It first deals with her humble beginnings as a small city-state in central Italy, continuing with the process of Roman hegemony in the Italian peninsula and the Mediterranean world. Lastly, the course ends with the times that led to the fall of the Roman Empire in the west in AD 476. Overall, the student will be introduced to the analysis of written and archaeological sources in order to answer the basic question: how do we know about the Romans? Thus, the analysis of the evidence will be the foundation to discuss major topics of Roman civilization. For instance, an examination of the city of Pompeii will allow us to reconstruct the daily life of a wealthy Roman city. As regards written sources, Cicero’s speeches and letters, for example, provides us with an unparalleled picture of the last years of the Roman republic.

**CLA 250 Ethnic Identity in Ancient Greece and Rome**
This course explores: theories about the roles of race, language, and culture in the construction of identity; the relative usefulness of historical and archaeological methodologies in attempts to understand past conceptions of identity; ethnic identity and the ethnic groups of the ancient Greek and Roman worlds as presented by specific ancient texts and archaeological remains; and the ways in which modern and contemporary ethnic issues have influenced the study of classical antiquity.

**PHL 201 History of Ancient Philosophy**
Survey of the origins of Western philosophy. The course begins with the Presocratics and ends six centuries later with the Hellenistic philosophers. The great philosophers of the Classical period, Socrates, Plato, Aristotle, are studied in detail.

**HIS 101 The Ancient World**
This course attempts to survey currents of human activity in the ancient and medieval worlds, from roughly 3000 BCE to 1600 CE. Given a subject so vast, we will focus on periods in world history which saw imperial societies emerge around the globe—what may be termed “the movement toward imperial centralization.” What sparked these movements, what characterized the societies affected by them, how and why did the dynamics for imperial societies emerge, and conversely, and how did these dynamics change, causing each society to fail? This course will address these questions and more, focusing on three major periods: from c. 3500 to c. 1200 BCE; from c. 800 BCE to c. 800 CE, and finally from c. 1050 to c. 1600 CE. Students will be expected demonstrate their knowledge and scholarly proficiency through a mid-term and a final exam, a 6-10 page research paper, 2-3 short homework projects, and a book review.

**HIS 102 The West and the World to 1500**
While exploring the history of Europe and its neighbors from the ancient to the medieval period, this course focuses on how people borrowed from, adapted, and reconciled various ideas to suit their own needs to form, over time, a coherent set of cultural values. To this end, we will consider several themes throughout the semester, including changing models of political organization, ideas of individual rights and responsibilities, attitudes towards women and ‘outsiders’, and understandings of nature and of divine power.

**HIS 103 The West and the World since 1492**
This course focuses on encounters between Europeans and people of other cultures from 1492 to the 1970s, on the development of the ideals of individual rights and popular sovereignty in Europe, and on the spread of the industrialized nation-state as an organizational model for societies throughout the world. Episodes and topics we may cover include the Spanish conquest of Mexico, English Civil Wars of the 17th century, the French Revolution and human rights, Japanese response to Western imperialism, and Stalinism.
HIS 162 Early America
Surveys European expansion into the Americas, the dynamics of colonization, cross-cultural encounters, and the emergence of distinct new American cultures between 1492 and the end of the American Revolution.

AH 242 Barbarian Europe
This offering explores the cultures of northern Europe from the 5th century BCE to the 10th century CE. In the first unit, we will deal with the Celtic peoples from their prehistoric pagan past to their continuing cultural identity after their conversion to Christianity, especially in Ireland. The second unit traces the Germanic peoples from their movement throughout Europe during the Migration Period to their conversion and settlement as Christian kingdoms. The last unit considers the history of the Vikings, "the last of the barbarians", and their impact on the Christian West. The course stresses the sources and interpretation of evidence from Archaeology, art history, historical texts, inscriptions, and place names, which allow us to reconstruct the cultures and assess their contribution to Medieval and, ultimately, Modern society.

CORE 4 – SCIENCE, TECHNOLOGY, AND SOCIETY

HIS 180 History of Technology
This course surveys the history of technology and its impacts on agriculture, communication, transportation, housing, health, war and society. The Romans used technology to build an empire, as did Venice, Great Britain, America, and the Soviet Union, but each also discovered the limits of technology. In addition to examination of inventors and inventions, the role of government and society in technological innovation will be examined.

HIS 185 Historical Origins of Modern Astronomy
The transformation of astronomy in the 16th and 17th centuries, especially through the work of Copernicus, Tycho, Galileo, Kepler, Descartes, Newton. Greek and medieval astronomy, the Copernican Revolution, observatories, telescopes and other instruments, universal physics, and orbital modeling. The course will help us to understand a perturbing puzzle in science's history: why did so many people come to believe that the earth revolved around the sun, long before evidence was available to support the change? How did they eventually get that evidence, and why did it not happen until centuries after they had made their choice?

MTH 300 History of Mathematics
The nature and style of mathematics in ancient Babylonia, Egypt, and Greece; medieval and Renaissance Europe; seventeenth-century Europe; and some aspects of the development of abstraction and rigor in analysis and set theory since 1700.

EES 215 Environmental and Applied Geophysics
This course aims to image the internal structure of the oceans and continents using geophysical methods. Topics include physical processes occurring within Earth's plates, including solar and internal energy sources, movement of fluids in the oceans and plates. Geophysical methods used to detect these processes and to constrain physical properties, including seismic, electro-magnetic, gravity as measured from surface, subsurface and satellites. Laboratory examples include environmental site remediation, hydrocarbon and mineral exploration, archeological remote sensing, tsunami detection, and groundwater exploration.

HIS 207 Technologies of the Scientific Revolution
A survey of how science was done during the Scientific Revolution of sixteenth to eighteenth century Europe, with particular attention to technologies and practices for producing, storing and transmitting knowledge. In addition to secondary source readings, the course will involve textual, visual and material primary sources, primary source studies, hands-on replication to investigate the nature of early modern science; how historical thoughts manifest in text, image and object; roles of instrumentation, specimens and spaces in scientific investigation.

ELECTIVE COURSES

ENGINEERING (Electives)

ME 110 Engineering Graphics (2 credits)
This course covers engineering drawing, and modeling using the Computer Aided Design software Pro/ENGINEER. Topics include orthographic projections, solid modeling, assemblies, and dimensioning. Students will complete the
course with a fundamental ability to create and understand solid modeling, and engineering drawings using state of the art PC CAD software. Lectures will make use of a computer projection screen as well as 30 individual computers.

**ME 120 Engineering Mechanics: Statics**
Basic concepts; units; vector algebra; forces; moments; force systems; equilibrium. Plane trusses; method of joints; method of sections; space trusses; frames and machines. Centroids of lines, areas, and volumes; center of mass. Distributed loads on beams; internal forces in beams; distributed loads on cables. Basic concepts of friction; dry friction; friction in machines.  
Prerequisite: MTH 161.

**ME 121 Engineering Mechanics: Dynamics**
This course uses an engineering approach to the solution of dynamics problems with an emphasis on conceptual understanding. Topics include kinematics and kinetics of particles and rigid bodies.  
Prerequisite: MTH 161 and MTH 162 or their equivalents, ME 120.

**ME 204 Mechanical Design**
Description: The theory and application of structural mechanics to mechanical design. Topics include: matrix structural analysis and finite element techniques. Students will use the NASTRAN finite element program to solve a variety of design and analysis problems. The term project consists of a team competition to design, analyze build, and test a lightweight structure.  
Prerequisite: ME 226 (ME 211 recommended).

**ME 222 Introduction to Robust Design and Quality Engineering**
Definition and pursuit of "quality" as a design criterion. The concept of robust design. Selection of the quality characteristic, incorporation of noise, and experimental design to improve robustness. Analysis and interpretation of results.  
Prerequisite: ME 164 or equivalent or permission of instructor.

**ME 225 Introduction to Fluid Mechanics**
Fluid properties; fluid statics; kinematics of moving fluids; the Bernoulli equation and applications; control volume analysis; differential analysis of fluid flow; inviscid flow, plane potential flow; viscous flow, the Navier-Stokes equation; dimensional analysis, similitude; empirical analysis of pipe flows; flow over immersed bodies, boundary layers, lift and drag.  
Prerequisite: MTH 163, MTH 164; PHY 121, ME 120, ME 123.

**CHE 243 Fluid Dynamics**
An introduction to the basic fluid flow and conservation laws of transport phenomena including the principles and applications of fluid mechanics (momentum transport) to engineering problems. Topics include a detailed analysis of conservation of mass and momentum equations, microscopic and macroscopic balances, dimensional analysis and the application of fluid flow problems to chemical engineering.  
Prerequisite: PHY 121, MTH 165 (may be concurrent).

**ME 226 Introduction to Solid Mechanics**
Prerequisite: ME 120.

**ME 254 Finite Elements**
This course provides a thorough grounding on the theory and application of linear finite element analysis in solid mechanics and related disciplines. Topics: structural matrix analysis concepts and computational procedures; shape functions and element formulation methods for 1-D, 2-D problems; variational methods, weighted residual methods and Galerkin techniques; isoparametric elements; error estimation and convergence; global analysis aspects. Term project and homework require computer implementation of 1-D and 2-D finite element procedures using Matlab. Term project not required for ME254.  
Prerequisite: ME 226, familiarity with Matlab.

**ART AND ART HISTORY (Electives)**

**AH 137 Introduction to Modern Architecture**
Topics include major figures such as Richardson, Sullivan, Voysey, Wright, Corbusier, or Mies van der Rohe, and topics such as the architectural development of structural metal, Art Nouveau, urban spaces, or the Bauhaus.

**AH 256 Vernacular Architecture in the USA**
This class provides an in depth exploration of American vernacular architecture. Scholars and architectural professionals apply the term “vernacular architecture” to traditional domestic and agricultural buildings, industrial and commercial structures, 20th century suburban houses, settlement patterns and cultural landscapes; in other words to “ordinary” or “everyday” spaces and places that people encounter daily but rarely think about critically. By looking at the work of scholars from the fields of anthropology, history, American studies, cultural geography, landscape architecture and history, folklore, and material culture we will investigate how these ordinary environments can help us to understand the culture of ordinary people. In particular, we will explore how “cultural landscapes” are created and how they construct frameworks that help us understand the significance that vernacular environments have had for their makers and users.

**AH 274 Cultural History of American Architecture**
This course will explore critical issues in American Architecture from an interdisciplinary perspective that focuses on the built environment. How do spaces shape history? Can we locate the history of slavery, corporate capitalism, the Cold War, or cultural imperialism, within their respective architectural spaces: the plantation, the family home, the skyscraper, the fallout shelter, or the international hotel? Over the course of the semester we will look at contemporary monographs of specific spaces alongside the work of key architectural historians and theorists. In addition, we will discuss novels, films, and paintings that foreground the centrality of architecture within American modernity.

**AH 284 Modern Architecture & Urbanism**
The architecture of Los Angeles will serve two different purposes in this seminar. On the one hand, we will study the whole range of modern architecture—from mission style (Gill), arts and crafts (Greene and Greene), and the early modernists (Wright, Schindler), to high modernism (Neutra, the Case Study houses), and postmodernism (Gehry)—as a singular regional, but nevertheless representative development of modern architecture. On the other hand, using architecture as a starting point, we will look at the strange utopia/dystopia of Los Angeles as an example of a new kind of urbanism and style of living. Our texts will include not only studies of architecture, but also Hollywood films (Chinatown, Bladerunner), detective novels (Raymond Chandler), new journalism (Joan Didion), and urban theory (Reyner Bahnham, Mike Davis).

**AH 320 The Politics of Space**
In this class we will explore how space is constructed and politicized. From the 19th century flaneur to 21st century cyber communities, from the global economy to domestic interiors, space has been and continues to be ideologically contested terrain. Together we will explore these contests. We will pay close attention to questions of identity formation, particularly as they relate to issues of gender, race and class. In addition, we will investigate the importance of technology in transforming the ways in which we think about space.
Restriction: Permission of instructor only.

**IT 244 / AH 244 Art History: Art, Architecture and Literature in the Age of Dante and Beyond**
(UR Arezzo Program – Fall Semester)
Tuscany, the cradle of Italian literary language and of the Renaissance, and one of the major centers of the development of medieval and Renaissance art and architecture, is both the focus and the theater of the course. Through lectures and field trips, students experience not only the artistic phenomena, but also the changing world view expressed through the various monuments and art forms under examination. The dual objective of the course is to teach both the language of painting and the language of architecture. Students learn techniques of architectural analysis in terms of its form and meaning. At the same time they see the main lines of development of Classical (Roman), Romanesque, Gothic, and Renaissance architecture found in the cities of Arezzo, Florence, Siena and Pisa among others.

**SA 131 Introductory 3D**
A wide range of materials and techniques from metal and welding to assemblage, from wood to experimental methods and media is explored in the service of three dimensional art making. Investigations of the specific qualities of three dimensional media (i.e. space, form, scale, mass) and how they can convey ideas are made within a contemporary framework. Artworks synthesize a particular choice and use of materials and a concept or expression. It is the aim of this class to develop this synthesis, and in so doing, begin to develop the students’ own working creative vocabulary. Not open to seniors. Studio art supplies fee: $50.
Restriction: Not open to seniors.
SA 232 Advanced 3D
This class broadens the investigation undertaken in Introductory 3D to include other materials and processes as well as a focus on working in an interdisciplinary fashion. This course furthers the development of the student's three dimensional form vocabulary and their options for articulating their ideas. The ability to verbally and visually articulate ideas is developed through group discussion and critique. Permission of instructor required. Studio Art Supplies Fee: $50

SA 233 Issues in Advanced 3D
This class broadens the investigation undertaken in introductory 3D classes to include other materials and processes as well as focus on working in an interdisciplinary fashion. These investigations will be directed to a chosen topic (TBA) relevant to contemporary art production. Projects open up the practice of sculpture to include an expanded notion of space and form to further the development of the student's three-dimensional vocabulary and further their options for articulating ideas. The scheduled class days will consist of studio production, slide presentations, technical demonstrations, discussion of assigned readings, one on one meetings, project critiques.

SCIENCES, TECHNOLOGY AND SOCIETY (Electives)

EES 119 Energy and Society
National and worldwide patterns of production and consumption of renewable and non-renewable energy sources and the connection of those patterns to socioeconomic conditions. For each resource, we consider the environmental effects of extraction, distribution, and consumption; how efficiently the resource is used and for what end uses; current reserves and projections for the future; socioeconomic and political factors affecting the resource's utilization; and international trade patterns and energy security. The course concludes with an overview of emerging energy technologies. NOTE: Juniors and Seniors in the natural sciences and engineering are required to enroll in EES 219.

EES 204 Earth Materials
Lectures discuss the physical and chemical principles governing the properties and formation of minerals. There are three major divisions of the subject matter: (a) geometric and optical crystallography; (b) crystal chemistry and properties of minerals, and (c) occurrence, origins, and pressure-temperature stabilities of the major rock-forming minerals. Laboratories are devoted to exercises in crystallography, X-ray diffraction, optical mineralogy and hand-specimen mineral identification.
Prerequisite: EES 101 or permission of the instructor.

EES 211 Earthquakes and Volcanic Hazards
Earthquakes and volcanic eruptions are violent manifestations of plate tectonics, the movement of the relatively rigid plates forming the Earth's outer shell. Ground movements and shaking from these events may generate tsunamis, slumping and mass wasting, and increase risk in other areas. Global and regional sea level rise changes forces on the plates, motivating reconsideration of hazard assessments. Large volumes of aerosols and greenhouse gases are emitted during the volcanic eruptions, with implications for global climate change. The first third of the class focuses on the causative mechanisms of earthquakes, volcanoes, tsunamis, volcanic-eruption induced climate change. The second third outlines the consequent hazards and forecasting efforts, and feedbacks between these processes. The final third of the course examines mitigation programs, with numerous case studies.

CLASSICS (Electives)

LAT 101 Elementary Latin I
Come learn the language of Vergil, Cicero, and St. Augustine. Latin has been the western world's learned language for 2000 years and is the source for most of the scholarly and technical vocabulary of English. The elementary Latin sequence (LAT 101, LAT 102, LAT 103) is designed to get you reading authentic materials quickly. For LAT 101, no Latin background is required or assumed.

LAT 102 Elementary Latin II
This course completes Latin 101’s introduction to Latin grammar and introduces the reading of continuous Latin prose.
Prerequisite: LAT 101 or permission of the instructor.

LAT 103 Intermediate Latin
This course, the third in the introductory series, consists of readings from a selection of Latin prose and poetry, with accompanying grammar review.
Prerequisite: LAT 102 or permission of the instructor.

**LAT 216 Roman Historians**
This course will focus upon the historiographical texts of the Roman historians Livy and Tacitus. We will concentrate upon translation and interpretation of selected passages from their texts and work on improving linguistic skills in the student. There will also be some discussion of the similarities and differences between Livy's style and content and Tacitus’.

**CGR 101 New Testament and Classical Greek I**
An introduction to Greek designed to prepare students to read the Classical Greek dramatists, philosophers, orators, and historians, and the New Testament.

**CGR 102 New Testament and Classical Greek II**
The primary focus of this course is to continue the study of basic grammar, vocabulary, and syntax in order to read ancient Greek texts. By the end of the semester you will have read unadapted selections from some of the foundational works of the western canon, including the philosophical writings of Plato, and the New Testament.
A continuation of CGR 101.

**CGR 103 Intermediate Greek**
Review of Greek grammar and readings in an unadapted prose text.
Prerequisite: CGR 102.

**CLA 135 Classical Mythology**
This course introduces the student to the mythology of the classical world. We will examine the major myths about the gods, the origins and nature of the universe, and the heroic past, as they developed in the Greek world and as they were adapted in the Roman world. We will consider the nature and function of myth in society, some theoretical approaches to myth, and the way in which myths were adapted by Greek and Roman authors to fit a particular literary or historical context. This course will also devote time to comparing the classical system of myths to other mythological systems.

**CLA 142 The Ideas of the Greeks**
A study of the major themes and ideas (literary, philosophical, religious, and historical) from Homer to Aristotle (e.g. excellence, fate, the gods, the soul, being, tragedy, comedy, Kosmos, logos, intellect, history, family, beauty, matter, nature, etc.). Lecture and discussion.

**CLA 209 Ancient Roman Religion**
This course explores the religion of the ancient Romans from the time of the founding of the city of Rome in the eighth century BC to the end of the Roman imperial period in the fifth century AD. We will examine the historical development of religious practices and expression over that time period, with discussion of Roman gods, priests and priestesses, ritual, religious sites, the ritual calendar, the imperial cult, and mystery cults.

**OPTIONAL INDEPENDENT STUDY & SENIOR THESIS**

**CORE 1 – ENGINEERING**

**ME 395 Independent Research**
This course is devoted to independent research project conducted under the supervision of a faculty in Mechanical Engineering.

**ME 393 Special Essay or Thesis**
This course is devoted to independent research project leading to the writing of a senior thesis conducted under the supervision of a faculty in Mechanical Engineering.
CORE 2 – ARCHAEOLOGY AND ARCHITECTURE

AH 391 Independent Study in Art History
This course is devoted to independent study in art history in consultation with full-time member of AH faculty.

AH 393 Senior Study
A directed, individual study project open to senior concentrators in consultation with full-time member of AH faculty.

CLA 391 Independent Study
By arrangement with the chair and with the consent of a full-time Classics faculty member, to permit work beyond the regular course offerings. Limited to juniors and seniors with background in the selected area of reading.

CLA 393 Senior Study
A directed, individual study project open to senior concentrators in consultation with full-time member of CLA faculty.

HIS 399 Advanced Field and Research Methods
Using Smiths Island, Bermuda, and a historical laboratory, this course trains experienced archaeology students in advanced field and research techniques, which may include geophysical remote sensing surveys, recording and GIS manipulation of digital site information, advanced lab analysis and artifact identification methods, independent historical research focused on site-specific questions, and independent field supervision of site and/or test pit excavations, depending on the interests of students. PRE-REQUISITE: HIS 299 or successful completion of a similar 5-week archaeology field school.

SA 391 Independent Study in Studio Art
This course is devoted to independent study in Studio Art in consultation with full-time member of SA faculty.

SA 393 Senior Project
A directed, individual study project open to senior concentrators in consultation with full-time member of SA faculty.

CORE 3 – History

HIS 391W – Independent Study
This course is devoted to independent study in history in consultation with full-time member of HIS faculty.

CORE 4 – Science, Technology, and Society

HIS 391W – Independent Study
This course is devoted to independent study in history in consultation with full-time member of HIS faculty.