
ART 466. Advanced Photography: Performance for the Lens. 3 credits. An exploration of technical, conceptual, and theoretical approaches to making, staging, and directing performance-based photographic work using film, digital or video cameras. Prerequisite: ART 360, ART 362 or ART 364.

ART 468. Advanced Photography: Screen-Based Photo/Video. 3 credits. An exploration of technical, conceptual, and theoretical approaches to making screen-based photographic projects culminating in a fully developed online presentation. Prerequisite: ART 362.

ART 469. Photography: Portfolio Development (0, 9). 1-3 credits, repeatable. An intensive exploration in photography focusing on a theme or process that results in a cohesive body of work from a self-directed project and a written artist’s statement. Prerequisite: ART 362, ART 362 or ART 364.

ART 470. Advanced Printmaking (0, 9). 1-3 credits, repeatable. Advanced projects in printmaking to be determined by the student and instructor. Prerequisite: ART 270, ART 272 or ART 274 as appropriate.

ART 480. Advanced Sculpture (0, 9). 1-3 credits, repeatable. Advanced study in sculpture focusing on projects chosen by the student in consultation with the instructor from an array of materials and processes used in contemporary sculpture. Prerequisite: ART 380.

ART 490. Independent Studies in Art. 1-3 credits, repeatable. Independent activity, such as research or studio practice, under faculty supervision. Projected studies in any area of the school’s offering must be arranged with the instructors who will direct them. Offered only with the consent of the instructor.

ART 491. Studio Assistant. 1-3 credits, repeatable. A on-campus program monitored on an individual basis designed to provide practical studio experience in the visual arts. Students will learn safe studio practices and management skills, including material use, inventory control and the proper operation of equipment found within various individual classroom studios. Prerequisite: Permission of the instructor.

ART 492. Topics in Art. 3 credits. Offering varies. Study of selected topics in art, art history, graphic design or interior design at the advanced level. May be repeated when course content changes. See MyMadison for current topics.

ART 493. Contemporary Art Theory. 3 credits. This is a reading, research and discussion seminar designed for upper level undergraduate and first-year graduate level studio art majors addressing historic and contemporary issues surrounding vision, the senses and aesthetics in the theory and practice of art.

ART 494. The Open Studio: An Interdisciplinary Approach to Creative Arts. 3 credits. Introduction to the interdisciplinary studio through discussion of the history of interdisciplinary art and exposure to contemporary examples from dance, theatre, music, creative writing, visual art, film and video. Emphasis on production of original work that evidences the use of another media or collaborative work by artists from different disciplines. Prerequisite: Permission of the instructor(s) and advanced skill level in one or more of the creative arts.

ART 495. Capstone Seminar: Three-Dimensional Art. 3 credits. A team-taught, intensive seminar for B.F.A. in studio art seniors with concentrations in metals/jewelry, ceramics, fibers or sculpture, or with an emphasis in integrated 3D. Capstone seminar is designed to be a transition into professional life, to help students organize and prepare themselves for the classroom studios. Prerequisite: Permission of the instructor.

ART 496. Capstone Studio: Three-Dimensional Art. 3 credits. An intensive studio for B.F.A. in studio art seniors with concentrations in metals/jewelry, ceramics, fibers or sculpture, or with an emphasis in integrated 3D. Working closely with their concentration advisor, students refine their artistic voice, build their portfolio and develop their senior thesis presentation. Prerequisite: ART 495. Corequisite: ART 497.

ART 497. Internship in Art. 1-8 credits. An program prepared and monitored on an individual basis. Internships are designed to provide practical experience in the arts. Prerequisites: Permission of the instructor and ARTH 394 if in museums and galleries.

ART 499. Honors. 6 credits total for three semesters (1, 2, 3).

Art Education
School of Art, Design and Art History
ARED 300. Art Activities in the Elementary School (1, 4). 3 credits. A study of the aims and philosophy of art education in elementary school with an emphasis on child growth and development through art. Experience with art techniques and materials suitable from nursery school through grade eight with emphasis on appropriate motivational and teaching methods. Includes intensive field experiences for elementary grade levels.

ARED 302. Secondary Art Education Methods. 3 credits. The study of art education methods, philosophy and contemporary practices as related to the middle and senior high school in public education. Includes class presentations, observation and practice in the secondary grades. Prerequisites: PSYC 270 and EDUC 280.

ARED 390. Independent Studies in Art Education. 1-3 credits. Independent activity at the intermediate level, such as research or studio practice, under faculty supervision. Projected studies in any area of the school’s offering must be arranged with the instructors who will direct them. Offered only with the consent of the instructor.

ARED 392. Topics in Art Education. 3 credits. Study of selected topics in art education at the intermediate level. May be repeated when course content changes. See MyMadison for current topics.

ARED 400. Visual Arts Across the Curriculum (1, 4). 3 credits. Explores ways in which the art teacher can promote relationships between art and other subjects within the public school curriculum. Emphasis will be placed on how art experiences can be used to teach skills and concepts associated with other subjects. Includes a range of intensive field experiences at the middle grade level.

ARED 490. Independent Studies in Art Education. 1-3 credits, repeatable. Independent activity, such as research or studio practice, under faculty supervision. Projected studies in any area of the school’s offering must be arranged with the instructors who will direct them. Offered only with the consent of the instructor.

ARED 491. Studio Assistant. 1-3 credits, repeatable. An on-campus program monitored on an individual basis designed to provide practical studio experience in the visual arts. Students will learn safe studio practices and management skills, including material use, inventory control and the proper operation of equipment found within various individual classroom studios. Prerequisite: Permission of the instructor.

ARED 495. Internship in Art Education. 1-8 credits. A program prepared and monitored on an individual basis. Internships are designed to provide practical experience in the arts. Prerequisites: Permission of the instructor and ARTH 394 if in museums and galleries.

Art History
School of Art, Design and Art History
GARTH 205. Survey of World Art I: Prehistoric to Renaissance. 3 credits. Offered fall and spring. An introduction to the art and architecture of the world from cave painting through European pre-Renaissance art. Includes ancient through medieval art in Europe and the Near East, as well as Asian and African arts.

GARTH 206. Survey of World Art II: Renaissance to Modern. 3 credits. Offered fall and spring. An introduction to art and architecture of the world from the Renaissance through Modern ages. Includes European Renaissance, Baroque, Enlightenment, 19th and 20th centuries, as well as Asian and African arts.

GARTH 300. African Art and Culture in the Humanities. 3 credits. An interdisciplinary introduction to African art and culture with topics focusing on life ways, music, religion, philosophy, art, literature and cinema. This course provides a strong background for upper-division course work in the arts of African and the African Diaspora, as well as for students pursuing degrees in history and anthropology. May be counted as GHUM 252.

ARED 308. Art History Seminar. 3 credits. Exploration of various methodological approaches in the history of art, including connoisseurship, iconography, formalism, psychological studies and interpretations of art and society. Students will examine contrasting interpretations of major works of art. Seminar format. Prerequisite: GARTH 206, GARTH 208 or permission of the instructor.

http://www.jmu.edu/catalog/14
Prerequisite: A study of European art (1750-1890) concentrating on Neoclassicism, ARTH 360. Nineteenth Century Art.

Renaissance style.

A survey of the development of Italian Renaissance art and architecture ARTH 346. Italian Renaissance Art.

of church design in Italy and the Byzantine World. Considers cross-

Survey of Early Christian, Hiberno-Saxon and Byzantine art 300-1200. Prerequisite: GARTH 205 or GARTH 206.

ARTH 310. African Art: The Sahara and Northern Sahel. 3 credits. An introduction to the arts and cultures of northern and northeastern Africa. The diverse, rich heritage of Africa's arts will be studied in depth. Prerequisites: Permission of the program leader and art history coordinator.

ARTH 205 or ARTH 206.

ARTH 313. Masterpieces of Italian Renaissance Art. 3 credits. (Semester in Florence only).

A survey of Italian Renaissance painting and sculpture (1280-1550), including the works of Giotto, Donatello, Masaccio, Fra Angelico, Botticelli, Leonardo and Michelangelo. Weekly visits to the Uffizi, San Marco, the Accademia and other Florentine museums.

ARTH 314. Masterpieces of Spanish Art. 3 credits. (Semester in Salamanca only).

A survey of art in Spain from prehistoric cave painting through 20th-century art. Emphasis is given to 17th-18th century Baroque and modern artists including El Greco, Velasquez, Goya, Gaudi and Picasso. Visits to Altamira, the Alhambra, the Prado, Toledo, Santillana del Mar and other sites.

ARTH 316. Masterpieces of British Art. 3 credits. (Semester in London only).

Survey of painting and sculpture in Britain (1530-1860) concentrating on 18th/19th-century painting. British art is viewed in the context of European civilization. Weekly visits to London museums including the Portrait Gallery, Sir John Soane’s House, the Wallace Collection and the Tate Gallery.

ARTH 320. Travel Study in Art History. 3 credits.

Art history credit is available to students participating in formal travel study programs with an emphasis on art history. Students maintain a journal with an emphasis on their art history experiences and write a research paper. Prerequisites: Permission of the program leader and art history coordinator.

ARTH 322. Ancient Art. 3 credits.

A comparative survey of major examples of art and architecture from the ancient world. Certain selected topics in pottery, painting and numismatic arts will be studied in depth. Prerequisite: GARTH 205.

ARTH 332. Islamic Art and Architecture. 3 credits.

This course will consider art from the age of the prophet Muhammad through the sixteenth century. The political and cultural contexts in which Islamic art developed will lay the foundations for understanding later traditions. These may include the role of the mosque in Muslim society; calligraphy and illustrated books; palace building and the arts of luxury; and modes of figural representation, including issues of gender. Prerequisite: GARTH 205.

ARTH 340. Early Medieval Art. 3 credits.


ARTH 346. Italian Renaissance Art. 3 credits.

A survey of the development of Italian Renaissance art and architecture 1280-1550, including the revival of classical art, the development of Humanism, the invention of perspective and the formation of the High Renaissance style. Prerequisite: GARTH 206.

ARTH 360. Nineteenth Century Art. 3 credits.

A study of European art (1750-1890) concentrating on Neoclassicism, Romanticism, Realism, Impressionism and Post-Impressionism in France. Prerequisite: GARTH 206.

ARTH 370. History of Interior Architecture. 3 credits.

Survey of the evolution of design in interiors from ancient to modern times with emphasis on period and furniture styles and architectural backgrounds. ARTH 372. Modern Art from 1900-1945. 3 credits.

A survey of European and American painting and sculpture from 1890 to the present day. Cubism and its off-shoots. Surrealism, American Abstract Expressionism, Pop art, Contemporary Conceptual art and Realism are among the movements studied. Prerequisite: GARTH 206.

ARTH 376. Modern Architecture. 3 credits.

Survey of architecture from 1851 to the present day. Thematic investigations will include regional, philosophical and technical developments in architectural space. Architects may include Labrouste, Berlage, Wagner and Richardson, through Wright, Mies, Le Corbusier, to the avant-garde Murcutt, Siza, Nouvel and Mockbee. Prerequisite: GARTH 206.

ARTH 380. American Art to 1870. 3 credits.

American painting, sculpture, architecture and decorative arts from the Colonial period through 1870. Topics will include Colonial portraiture, African-American aesthetics, the definition of folk art, nationalism and landscape painting, and the question of American exceptionalism. The course will also introduce students to problems of interpretation in current scholarship. Prerequisite: GARTH 206.

ARTH 382. American Art from 1870. 3 credits.

American painting, sculpture, architecture and decorative arts from 1870 to 1945. This course will address topics such as the American Renaissance, the Harlem Renaissance, Chicago School architecture, masculinity in Western American art, notions of decay in turn-of-the-century art and American modernism. It will also introduce methodological debates in current scholarship. Prerequisite: GARTH 206.

ARTH 389. Topics in Art History. 3 credits.

Study of selected topics in art, art education, art history, graphic design, interior design or industrial design at the intermediate level. May be repeated when course content changes. See MyMadison for current topics.

ARTH 390. Independent Studies in Art History. 1-3 credits.

Independent activity at the intermediate level, such as research or studio practice, under faculty supervision. Projected studies in any area of the school’s offering must be arranged with the instructors who will direct them. Offered only with the consent of the instructor.

ARTH/HIST 394. Introduction to Museum Work. 3 credits.

A study of the philosophy and practice of museum work including the areas of exhibit design, conservation registration, education and administration. Subject is taught from the perspective of the museum profession and is applicable to diverse discipline and types of collections.

ARTH/HIST 396. Introduction to Public History. 3 credits.

An introduction to the varied and interdisciplinary “field” of public history, such as community/local history, historic preservation, archives, historical archaeology, museum studies, business and policy history, documentary editing and publishing, and documentary films, through readings, class discussions, occasional guest speakers and occasional field trips.

ARTH 403. Topics in Italian Art. 3 credits. (Semester in Florence only).

Topics in Italian art may include studies of major artists or themes of Italian art, design and architecture from ancient times to the present. Topics may include the history of conservation and restoration, food culture and its representations or Italian cinema. May be repeated when course content changes.

ARTH/HIST 406. Monticello. 3 credits.

A seminar on the architecture and material culture of Thomas Jefferson’s Monticello. The course will examine the house’s design, artwork, decorative arts, mechanical devices, landscape/garden design and Mulberry Row. Topics will include African-American artisans at the Monticello joinery; Jefferson’s Indian Hall and European and African-American domestic life in the Federal Period. Required field trips.

ARTH/HIST 408. The Museum: Histories and Controversies. 3 credits.

This seminar centers on art museums in the United States. Topics include the historical development of museums, related cultures of display, recent debates on institutional mission and responsibility, and contemporary artists who employ the museum as medium, subject matter or site. Required field trips. Prerequisite: GARTH 206.

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ARTH 410. African Art: The Sahara & Northern Sahel. 3 credits.
An introduction to the arts and cultures of northern and northwestern Africa. The diverse, rich heritage of Africa’s arts will be explored through the major style areas of Saharan and northern Saharan rock arts, Egypt, northern Africa, Christian northeastern Africa, and Islamic North Africa. Prerequisite: ARTH 205 or ARTH 206, or permission of the instructor.

ARTH 411. Modern and Contemporary African Art. 3 credits.
This course examines the rise of Modern and Contemporary art movements throughout Africa, from 1958 to the present. As colonial influence diminished, important artists, art schools and exhibition tactics have emerged. Developments in painting, sculpture, photography, video and film illustrate the tensions and triumphs of contemporary African nations. Course work centers on a substantial research paper based on primary source material. Additional assignments required for graduate level course.

ARTH 419. Topics in African Art. 3 credits. Offering varies.
Topics in African art will deal with the current thematic or methodological issues such as contemporary African arts and artists, arts of the African Diaspora, a particular media (such as architecture or the textile arts), portrait and identity, the royal arts of Africa, African film and performance, or gender in the arts of Africa. See MyMadison for current topics. Prerequisite: GARTH 205, GARTH 206 or ARTH 210.

ARTH 424. Arts of Ancient Egypt. 3 credits.
A study of the arts and culture of Ancient Egypt (c. 3000 B.C. to c. 300 B.C.). This course will focus on the art and architecture of the Old and New Kingdoms and also examine the enduring fascination with this unique artistic heritage from the excavations of Napoleon to the present. Prerequisite: GARTH 205 or GARTH 206.

ARTH 430. Far Eastern Art. 3 credits.
A survey of East Asian art from prehistoric times to 19th century colonialism. Emphasis is on the areas of major production: India, China and Japan, with less attention to such centers as Cambodia, Siam and Korea. Prerequisite: GARTH 205 or GARTH 206.

ARTH 431. Topics in Medieval Art. 3 credits. Offering varies.
Topics in Medieval Art may include the study of major buildings and artistic monuments in the medieval Mediterranean and in Western Europe, art in service of empire building, medieval audiences and modes of reception, and the afterlives of monuments into the contemporary period. Prerequisite: GARTH 205.

ARTH 442. Art of Later Middle Ages. 3 credits.
A study of Western European arts and architecture in the later Middle Ages with concentration on Romanesque and Gothic styles (1000-1400). Examines church construction and allied arts around the millennium and the development of Gothic architecture, sculpture and painting in France, Italy and England. Prerequisite: GARTH 205.

ARTH 444. Gothic and Gothic Revival Architecture. 3 credits.

ARTH 446. Renaissance Art and the East. 3 credits.
This seminar explores artistic exchange between the Christian west and competing cultures in the east from c. 1250-1600, focusing on the powers of Italy and their interaction with the Islamic dynasties, the Mamluks of Egypt and the Ottomans in Turkey, as well as the Christian state of Byzantium. Special topics of interest may include palace architecture and imperial ceremony, urban planning, portraiture and caricature, the exchange of luxury goods; and the use of art as a diplomatic tool. Prerequisite: GARTH 206 or a course in medieval and renaissance studies.

ARTH 448. Studies in Leonardo and Michelangelo. 3 credits.
Seminar that examines the artworks of Leonardo da Vinci and Michelangelo Buonarroti. Discusses issues such as the artist’s creative process, the development of the artist’s style, the patron’s role in art and the inter-relationships between the artist’s visual and literary works. Prerequisite: GARTH 206.

ARTH 449. Topics in Renaissance Art. 3 credits. Offering varies.
Topics in Renaissance art may include studies of major Italian or Northern Renaissance artists, the development of linear perspective, the Renaissance tomb chapel, or art and politics of the Protestant Reformation. Prerequisite: GARTH 206.

ARTH 450. Baroque Art. 3 credits.
A survey of European art and architecture of the 17th century. This course will focus on Baroque art and its cultural context in Italy, France, Britain and Holland. Prerequisite: GARTH 205.

ARTH 452. Eighteenth Century Art. 3 credits.
Survey of the major European artistic movements of the 18th century. This course will focus on the development of the Rococo and Neo-classical styles in architecture, sculpture and painting. Prerequisite: GARTH 206.

ARTH 459. Topics in Seventeenth and Eighteenth Century Art. 3 credits. Offering varies.
Topics in this course may include studies of particular artists such as Rembrandt, Caravaggio or Watteau, studies of particular styles such as the Rococo or thematic studies such as the history of garden design or the development of art theory. See MyMadison for current topics. Prerequisite: GARTH 205, GARTH 206 or a course in medieval and renaissance studies.

ARTH 460. Nineteenth Century Art. 3 credits.
A study of European art (1750-1890) concentrating on Neoclassicism, Romanticism, Realism, Impressionism and Post-Impressionism in France.

ARTH 464. Romanticism and Enlightenment. 3 credits.
This seminar examines European art of the Romantic period, c. 1770-1830. Course themes include the representation of nature, art and the emergence of the nation-state, sensibility and the rise of historicism. In addition to visual culture, attention will be devoted to significant philosophical and literary texts from the period. Prerequisite: GARTH 205 or GARTH 206.

ARTH 466. Art and Nationalism. 3 credits.
Advanced seminar examining the intersection between art and nationalism from the late-eighteenth century to the present. Topics may include propaganda, monuments and the construction of national memory. Particular attention will be devoted to the shifting nature of commemorative practice throughout the modern period. Prerequisite: GARTH 205 or GARTH 206.

ARTH 469. Topics in Nineteenth Century Art. 3 credits. Offering varies.
Topics in nineteenth century art may include studies of major artists, such as Caspar David Friedrich or Edouard Manet, specific artists groups like the pre-Raphaelite brotherhood, or thematic issues such as the relationship between art and nationalism. See MyMadison for current topics. Prerequisite: GARTH 206.

ARTH 471. Commemoration and Controversy: Public Art in America. 3 credits.
This course examines the socio-historical, political, cultural, and philosophical dimensions of public art in American society, from the Early Republic to the present day. Topics may include: the nature of public art, its uses and functions, as well as civic and official attitudes towards art in the public sphere. Issues of censorship, propaganda, and the “culture wars” of the 1980s and 90s will be highlighted. Prerequisite: GARTH 206.

ARTH 472. Modern Art Since 1945. 3 credits.
A study of the many developments and trends in American and European art since 1945. This course will focus on such movements as abstract expressionism, pop, conceptual art, installation art, video, film and computer art with an understanding of the theoretical basis of those movements and the development of the art market during this period. Prerequisite: GARTH 206.

ARTH 474. The New Media and Contemporary Art. 3 credits.
Advanced seminar that addresses the impact of cultural politics and technology on how we make, evaluate and “speak” about art. Focus on a variety of media including video, multi-media installations, conceptual art, computer generated imagery, virtual “reality,” contemporary film and digital photography. Prerequisite: ARTH 372 or ARTH 472.

ARTH 475. Topics in Twentieth Century Art. 3 credits. Offering varies.
Topics in twentieth century art may include studies of contemporary painters (i.e., Gerhard Richter), sculptors (i.e., Kiki Smith or Mona Hatoum), performance and video artists (i.e., Bill Viola) or thematic issues such as the relationships between art, technology and gender/racial politics. See MyMadison for current topics. Prerequisite: ARTH 372 or ARTH 472.

ARTH 484. Art of the Americas. 3 credits.
Art of indigenous peoples in the Americas (Meso, Central, South and /or North) before European contact. The course will examine domestic and state architecture, painting, textiles, ceramics, metalwork, and earthworks within the context of geographic, state, religious and social issues. Other topics include museum display, repatriation and western taxonomies.
ARTH/AFST 488. African-American Art. 3 credits. This course examines visual arts produced by people of African descent in the United States from the colonial period until the present. Course themes include debates about the relationship between racial identity and artistic production; the complex interchange between African-American art and the cultural traditions of Africa and Europe; black artists’ engagement with popular representations of African-Americans; and the intersection of race with class, gender, and sexuality. Prerequisite: GARTH 208 or GAFST 200.

ARTH 489. Topics in Art History. 3 credits. Offering varies. Study of selected topics in art history at the advanced level. May be repeated when course content changes. See MyMadison for current topics.

ARTH 490. Independent Studies in Art History. 1-3 credits, repeatable. Independent activity, such as research or studio practice, under faculty supervision. Projected studies in any area of the school’s offering must be arranged with the instructors who will direct them. Offered only with consent of the instructor.

ARTH 491. Exhibition Seminar. 3 credits. Advanced seminar explores museum theory and practice through the collaborative design of an exhibition for an on-campus gallery space. The course focuses on developing and researching the exhibition topic, investigating the specific art objects and preparing critical educational materials or catalogue. The class project also includes mounting the exhibit in a real or virtual installation space. Prerequisite: GARTH 205 OR GARTH 206.

ARTH/ANTH/HIST 482. Material Culture. 3 credits. A broad introduction to the multidisciplinary “field” of material culture studies through readings, written assignments, in-class exercises and field trips. The course introduces ways of looking at and learning from objects and examines how scholars from several disciplines have used material culture in their work. Prerequisite: HIST 395. Instructor’s permission required to waive HIST 395 prerequisite for non-history majors.

ARTH/HIST 492. Historic Preservation. 3 credits. An introduction to the philosophy and techniques of historic preservation, guidelines for restoration, state and national register forms and procedures, historic architecture, structural analysis, restoration techniques, as well as the business aspects of historic preservation projects. Field trips are a major component of the course. Prerequisite: HIST 395. Instructor’s permission required to waive HIST 395 prerequisite for non-history majors.

ARTH 495. Internship in Art History. 1-3 credits. An off-campus program prepared and monitored on an individual basis. Internships are designed to provide practical experience in the arts. Prerequisites: Permission of the instructor and ARTH 394 if in museums and galleries.

ARTH 499. Honors. 6 credits total for three semesters (1,3,2).

Astronomy

Department of Physics and Astronomy

*ASTR 120. The Solar System. 3 credits. An introductory course in astronomy, which includes the following topics: motions of celestial objects, eclipses, historical development, the nature of light, telescopes, properties and evolution of the solar system.

*ASTR 121. Stars, Galaxies and Cosmology. 3 credits. An introductory course in astronomy which includes the following topics: the Sun, stellar properties, stellar evolution, black holes, the Milky Way, galactic evolution, quasars, cosmology.

ASTR 220. General Astronomy I: The Night Sky, the Solar System and Stars. 3 credits. ASTR 220 is the first in a two-course sequence in general astronomy intended for students with a background in physics. Topics covered include: appearance and movements of the night sky; astronomical coordinate systems and timekeeping; seasons, eclipses and planetary configurations; planetary motions and gravitation; fundamental forces; electromagnetic radiation and its detection; content, structure, formation and evolution of solar system; observations and models of the Sun, stellar interior models; stellar magnitudes and spectra, classifications; Hertzsprung-Russell diagram. Prerequisite: PHYS 140 or PHYS 240.

ASTR 221. General Astronomy II: Star Systems, the Interstellar Medium and Cosmology. 4 credits. ASTR 221 is the second in a two-course sequence in general astronomy intended for students interested in science. Topics covered include: stellar evolution; variability and high-energy phenomena in stars and multiple-star systems; content, structure, and dynamics of the Milky Way; external galaxies, quasars and AGN, large-scale structure and the distance scale of the universe; the Big Bang model and alternative cosmologies, possible geometries and eventual fates of the universe. An observational astronomy laboratory component is part of this course. The lab component will cover basics of telescope set up and operation as well as astronomical coordinate systems. Prerequisite: ASTR 220.

ASTR 297. Topics in Astronomy. 1-4 credits. Topics in astronomy at the second year level. May be repeated for credit when course content changes. Topics selected may dictate prerequisites. Students should consult instructor prior to enrolling for course. Prerequisite: Permission of the instructor.

ASTR 301. Searching for Life in the Universe. 3 credits. A study of the search for life in the universe, with emphasis on teacher preparation. Topics include how life on earth can guide the search, conditions for life within our solar system, extrasolar planets that may be conducive to life, possible radio communications with other civilizations and technologies necessary for search. Significant time is spent developing student lesson plans. Prerequisites: GSCI 181, GSCI 162, GSCI 163 and GSCI 164.

ASTR 320. Astronomical Techniques. 3 credits. An overview of modern astronomical techniques with an emphasis on quantitative data collection and analysis. The design and use of various astronomical devices will be covered. Topics will include visible light telescopes and radio telescopes as well as CCD data collection in addition to other current astronomical techniques. Data reduction software will also be addressed. Prerequisites: ASTR 220 and ASTR 221.

ASTR 397. Topics in Astronomy. 1-4 credits. Topics in astronomy at the intermediate level. May be repeated for credit when course content changes. Topics selected may dictate prerequisites. Students should consult instructor prior to enrolling for course. Prerequisite: Permission of the instructor.

ASTR/PHYS 398. Independent Study in Physics or Astronomy. 1-3 credits, repeatable to 4 credits. An individual project related to some aspect of physics or astronomy. Must be under the guidance of a faculty advisor. A student may not earn more than a total of four credits for PHYS/ASTR 398.

ASTR 480. Astrophysics. 3 credits. An introduction to the problems of modern astronomy and the quantitative application of physical principles to these problems. Topics of study include stellar structure and evolution, the interstellar medium and star formation, cosmic rays, pulsars, galactic structure, extragalactic astronomy and cosmology. Prerequisites: PHYS 340 and PHYS 380.

ASTR 497. Topics in Astronomy. 1-4 credits. Topics in astronomy at the advanced level. May be repeated for credit when course content changes. Topics selected may dictate prerequisites. Students should consult instructor prior to enrolling for course. Prerequisite: Permission of the instructor.

ASTR/PHYS 489R. Undergraduate Research in Physics or Astronomy. 1-4 credits, repeatable to 6 credits. Research in a selected area of physics or astronomy as arranged with a faculty research advisor. A student may not earn more than a total of six credits for PHYS/ASTR 489R. Prerequisite: Proposal for study must be approved prior to registration.

Athletic Training Education Program

Department of Health Sciences

ATEP 205. Introduction to Athletic Training (2, 2). 3 credits. Offered fall, spring and summer. This course provides a broad introduction to the profession of athletic training. Lectures will focus on the domains of athletic training. Emphasis will be placed on basic emergency management as well as injury prevention including environmental issues, strength and conditioning, and selection of equipment. Laboratory will mirror lecture. Prerequisite: ATEP or HS major, coaching minor, or permission of the instructor.

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