VISUAL ARTS

http://krieger.jhu.edu/visualarts/

The Center for Visual Arts engages and challenges students in the study and practice of the visual arts to encourage innovative making and thinking, risk taking and creative problem solving that is applicable to research across disciplines.

Visual arts courses examine contemporary and historical perspectives in art while providing an inclusive environment where ideas are shared and acted upon.

Central to this mission of challenging students and advancing their knowledge and skills in the arts are classes that offer faculty led cross-disciplinary collaboration within diverse academic programs at JHU and the greater Baltimore community. CVA faculty are accomplished artists, photographers, designers, and illustrators.

Students can minor in art or take general elective classes from a diverse curriculum that includes drawing, painting, printmaking, digital photography, visual communication, fiber art and a range of special topics courses. Through Johns Hopkins' cooperative programs with MICA (Maryland Institute College of Art) and other colleges in the Baltimore area, students can take courses not offered at the Center for Visual Arts.

The CVA hosts an annual fall faculty show to highlight the creative work of current faculty.

Each spring, the Johns Hopkins community is invited to attend an exhibition of the year's best work by CVA students. Additionally, a variety of temporary exhibits are hosted in the department throughout the year.

The CVA invites award winning artists to campus every semester to work with students and give a public presentation about their art practice. News and events can be found on our social media pages:

https://www.facebook.com/jhuvisualarts/

https://www.instagram.com/explore/tags/jhuvisualarts/

Programs

- Visual Arts, Minor (https://e-catalogue.jhu.edu/arts-sciences/full-time-residential-programs/degree-programs/art-workshops/visual-arts-minor/)

For current course information and registration go to https://sis.jhu.edu/classes/

Courses

AS.371.126. Fiber Art and the String Revolution. 3 Credits.
This course presents students with technical, historical and cultural understanding of the fiber medium. Students learn the basics of textile processes, including dyeing, felting, knitting, weaving, sewing, and lacemaking. Technical demonstrations and samples will be covered in class while students are encouraged to expand upon covered material through long-term personal projects. Technical demonstrations will be supported with slide lectures demonstrating the historical context of fiber processes and their contemporary applications. Attendance in 1st class is mandatory.
Area: Humanities

AS.371.129. Botanical Painting in Watercolor and Gouache. 3 Credits.
This introductory painting class is an exploration of the ways watercolor and designer gouache are used together to paint organic materials representationally. We'll study the difference between botanical painting and illustration and trace how women specifically have shaped this genre of art through history. Students will learn techniques from both observation and invention and artwork will be assessed in weekly group critiques. Course includes demonstrations, short readings and a research paper about a botanical artist.
Area: Humanities

AS.371.130. Smartphone Photography. 3 Credits.
This course will explore creative techniques for making visually compelling photographs using smartphone technology. Through photography assignments, demonstrations, and field trips, we will experiment with many photography apps which can be used for manual camera exposure, image adjustments, digital collaging, and other visual effects. We will use Fuji and Canon smartphone printers to make inkjet and polaroid prints of our phone images and use various social media platforms to submit course projects. We will also discuss the ethical responsibilities of using smartphones in public spaces as well as how the history of technology has shaped our understanding of art, culture, and everyday life. Attendance in first class is mandatory.
Area: Humanities

AS.371.131. Foundation Drawing. 3 Credits.
This three-credit studio course is an introduction to the tools, techniques, and concepts of basic drawing. Studio projects will focus on building strong observation and rendering skills while experimenting with traditional and contemporary practices in drawing. The course will provide insight into understanding a "drawing" as a visual perception and as a concept. Some drawing projects will take place outside of the classroom exploring hidden gems around Baltimore including the Graffiti Alley, Walters Art Museum, John Hopkins Archeological Museum, Greenmount Cemetery, Baltimore Museum of Art and more. No previous experience is required for this course. Attendance in first class is mandatory.
Area: Humanities

AS.371.133. Oil Painting I. 3 Credits.
This course is designed as an introduction to the tools, techniques and concepts of basic painting for the serious student. Studio assignments focus on developing strong observation and rendering skills focusing on issues of light, color and composition while experimenting with traditional and contemporary practices in painting. Lectures and a museum trip give students an art historical context in which to place their own discoveries as beginning painters. Oil paint will be used. No previous experience is necessary. Attendance in first class is mandatory.
Area: Humanities

AS.371.137. Smartphone Photography. 3 Credits.
In this course, students will explore creative techniques for making visually compelling photographs using their smartphone camera. Through photography assignments, demonstrations, and virtual collaborations, we will experiment with many photography apps which can be used for manual camera exposure, image adjustments, digital collaging, and other visual effects. We will learn about the history of social media and use some of the current platforms to submit our course projects. We will also discuss the ethical responsibilities of using smartphones in public spaces as well as how the history of technology has shaped our understanding of art, culture, and everyday life.
Area: Humanities

AS.371.147. Art of Architecture: Homewood, Baltimore and Beyond. 3 Credits.

In this course, students will learn to design, draw, and see like an architect. A series of progressive design exercises will teach the practical capacities and habits of mind that lead not merely to competence but success and advancement in the field. We will look at what architecture has been, discuss what it is becoming, and explore both formal and narrative methodologies for design. The class will use the built environment of the city - and the Homewood campus - as a classroom and a site for interpretive drawing and creative design work. Essential in the architect's education is the sketchbook, which functions not merely as a place to 'store' what has been witnessed, but a place to interpret and explore implications of design in the world, whether close to home or traveling in exotic locales.

Area: Humanities

AS.371.151. Photoshop: The Digital Darkroom. 3 Credits.

This course concentrates on the fundamentals of Lightroom and Photoshop for photographic post-processing and creative image-making techniques. Students will gain a proficient workflow for image development using such tools as adjustments, gradients, actions, masking, and other post-production methods. Course projects will include digital collaging and hand coloring techniques, and will pull inspiration from various artistic movements, field trips to local museums, and exploring the surrounding Station North neighborhood. Students will also learn inkjet printing as a mode for bringing their digitally crafted images to life. Students will receive instruction on DSLR cameras, which are available on semester loan. Attendance in first class is mandatory.

Area: Humanities

AS.371.152. Introduction to Digital Photography. 3 Credits.

This studio art course will introduce students to the basic techniques and applications of fine art photography using digital technology. Emphasis will be placed on DSLR camera functions, image manipulation with Adobe Creative Cloud, and digital inkjet printing. Throughout the semester, students will engage in classroom critiques and discussions to aid their dialogue on art and their understanding of photographic imagery. In this course, creative exploration will be fostered through the visual language of photography. DSLR film cameras are available on semester loan. Attendance in first class is mandatory.

Area: Humanities

AS.371.153. Introduction to Visual Communication- Graphic Design. 3 Credits.

The digital design course explores two-dimensional graphics as visual communication. Students will be introduced to basic design principles and elements, learn graphics tools used in the designindustry, and develop and apply creative strategies to solve design problems in their everyday lives. This unique course will address the students' direct needs through real-life design problems they face. Students will be asked to bring design challenges and tackle the issue both independently and collaboratively. Design challenges may include building print and web visual presentations, producing information brochure and posters, developing off and online portfolios, creating a resume to business cards. The course will offer both analog and digital design processes, graphics software tutorials and techniques, and basic introduction to design history, vocabulary and concepts. Attendance in first class is mandatory.

Area: Humanities

AS.371.154. Introduction to Watercolor. 3 Credits.

Watercolor is simultaneously the most accessible of all painting media and the most misunderstood. This course provides experience and instruction in observational and expressive watercolor techniques, materials, concepts, and vocabulary. Topics to be reviewed include line, perspective, value, texture, composition, color, and pictorial space. There will be an introduction to contemporary practices in watercolor, as well as experimental and abstract exercises, collage, and conceptual work.

AS.371.180. Exploring Line. 3 Credits.

This challenging yet creatively playful course presents abstract, perceptual and conceptual concepts in art to understand line, one of the elements of art, from multiple perspectives, materials and practices. Be prepared to collaborate and experiment! Through an intense exploration of line, students will create artworks exploring line as marks on a flat surface (drawing), lines that communicate data (design), lines that build form (sculpture) and lines that embody movement (performance and video). Possible assignments will include projects with drawing, printmaking, fiber, cell phone video, installation, unconventional or recycled materials and collaboration. • This is not a drawing class but a multimedia course on one of the elements of art.Instructor approval and attendance at first class is mandatory.

Area: Humanities

AS.371.184. Introduction to Silk Screen Printing. 3 Credits.

This course is an overview of hand-drawn and digital methods for silk screen printing. Through demonstrations and self-guided projects, students will develop their compositional skills, while creating images based on narrative, self-reflection and intercultural connectivity. Technical skill development such as film/screen preparation, image registration, and techniques for printing on paper and other materials will be introduced. The history of the medium and an overview of how analog and digital processes can create and inform a printed image will be discussed. The course will culminate with students producing an edition of prints. No prior experience is needed. Attendance in first class is mandatory.

Area: Humanities

AS.371.185. Printmaking: Multiples and Variations. 3 Credits.

In this course students learn to create marks, textures and imagery using a variety of printmaking techniques. Students create relief and intaglio printing matrices and practice printing by hand and with a press to reproduce their images. The class culminates with explorations of layered printing, monoprinting, and mixed media approaches to create unique 2-dimensional and 3-dimensional works. Attendance in first class is mandatory. No prior experience is needed.

Area: Humanities

AS.371.186. Fundamentals of Design Drawing and 3-D Visualization. 3 Credits.

This course introduces the tools, techniques, and technologies of design representation in a project-based setting. Students will build drawing skills, learn the principles of perspective, and explore theories and applications of design media and emerging digital technologies. Designing projects at various scales from the hand-held object to the public realm, we will develop creative problem solving, design thinking, and iterative design methodologies, leaving the course with the ability to apply the foundations of design to any discipline. Special note: This spring our course will be geared toward collaborative and site-based practices. Class meetings will begin with remote instruction and collaboration, and expand to include site visits as the season progresses. This course will satisfy the foundation drawing class for the art minor.

Area: Humanities

AS.371.187. Intermediate Drawing, A Contemporary Approach. 3 Credits.

This is an intermediate drawing class that builds on the concepts and skills in Studio Drawing 1. Students will explore contemporary and conceptual approaches to drawing while further developing their skills in various graphic mediums. Risk taking and experimentation will be encouraged while learning about comtemporary practices in the medium. The course will conclude with students creating an individual series of drawings of their choice.

Prerequisite(s): AS.371.131 OR AS.371.186
Area: Humanities

AS.371.210. Drawing: Who's Telling the Story?. 2 Credits.

What makes an image truthful?Students will create drawings utilizing both traditional and unconventional processes through the lens of historical and political illustrations, propaganda graphics and misinformation, and current events. The course is anchored in, but not limited to, the art practices of Kara Walker's slavery narrative, George Grosz's political caricatures of First War Germany, historical war posters, Hugo Crosthwaite's depiction of the US/MX border to Coronavirus "beauty shot." Projects may include revising a historical artwork, manipulating propaganda graphics of the past and the present, redrawing a visual data, and designing a personal narrative drawing project. Field trips, technical demos, discussions, and lectures will provide context and support for students to become image-makers of their own narrative and history. Attendance in first class is mandatory. Recommended but not required: AS.371.131
Area: Humanities

AS.371.211. Artist Books: Draft, Print, Stitch. 3 Credits.

In this studio art class students will create three artist books taught by three different CVA faculty. The first four weeks will investigate the book as a technological and cultural artifact, exploring historically what the book is and does, and as a cognitive aid and engine for ideation. Students will create a blank book that they use for their creative explorations.The second section will use printmaking techniques such as paper lithography, xerox transfers, and relief printmaking combined with quick and ephemeral folding structures in an effort to understand both printmaking and bookmaking's rich history in dissemination of ideas, democracy, and social change. This section will participate in a class zine exchange. The third section of the course will explore embroidery and weaving to navigate language and mark making. Students will explore the relationship between poetry, storytelling, and fiber processes to create a narrative textile. Attendance in first class is mandatory.
Area: Humanities

AS.371.216. From the still life to the figurative: Photographic Lighting Techniques. 3 Credits.

In this photography course, we will learn about photographic lighting techniques used by photographers in both commercial and fine art photography. We will explore how design, composition, location, and use of color play integral roles in photographic images. Projects in this course will explore the boundaries of both representation and abstraction, by working with such themes as portraiture, still life, product, environmental, and location photography. We will gain technical proficiency with studio lighting equipment, including strobe lights, LED lights, clamp lights, on-camera flash, light stands, backdrops, color gels, and other lighting accessories. DSLR cameras are available on loan for the semester. Attendance in first class is mandatory.
Area: Humanities

AS.371.217. Film Photography in the Digital World. 3 Credits.

In this photography course, we will learn how to use traditional 35mm film cameras for photographing on both color and black and white film stocks. We will outsource our film to a local professional photo lab to develop our film and provide us with high-resolution digital scans. Demonstrations in Lightroom and Photoshop will provide us with the technical skills to edit and adjust our film scans to make beautifully crafted digital inkjet prints. Various paper brands and surfaces will be explored to show how substrate choices emphasize the textural qualities and tonal range of film. We will study a wide range of topics in photography, such as identity, family, environmentalism, culture, politics, and history, as well as other genres and themes in art. We will also learn about the invention of photography and how the technical evolution of the film camera helped in advancing the medium into the digital realm. Attendance in first class is mandatory.Please note, that this is not a darkroom course, therefore, there will be no hand development of film or traditional darkroom printing. 35MM film cameras are available on semester loan.
Area: Humanities

AS.371.219. Experimental Photography: Light Sensitive Processes. 3 Credits.

In this photography course, we will combine historic and contemporary photographic processes as a means of creative investigation. We will have an in-depth look at such processes as Cyanotypes, Lumen Printing, Anthotypes, Photocollage, Digital Negatives, and how to create Camera Obscura. We will explore an array of substrate choices, such as darkroom papers, watercolor papers, newsprint, fabric, and other unconventional surfaces. We will use these processes and substrates to make contact prints and impressions of various types of materials, ranging from plants, flowers, food, liquids, everyday objects, and previously made photographs. Emphasis will be placed on the ephemeral nature of photography and the ways in which the medium can be pushed beyond its limitations. Attendance in first class is mandatory.
Area: Humanities

AS.371.226. Sculptural Fibers. 3 Credits.

The fabric of the universe, a wrinkle in time and space: our physical universe is frequently described through fiber metaphors. Fiber processes are algorithmic. They grow exponentially, they fold, they tear, they wrinkle. These processes function as a pliable plane that can be bent, stretched, and turned inside out. This course offers students an opportunity to explore fiber processes through this sculptural lens. Topics include knitting, crochet, basketry, and lace as they come together to form sculptural armatures and objects. Together we will explore the physical properties of fiber and textiles, how they take up space and function in our world. Attendance in first class is mandatory. Recommended but not required: AS.371.126 Fiber Art and the String Revolution.
Area: Humanities

AS.371.228. Investigations in Still Life Photography. 3 Credits.
Students will learn approaches to taking still life photographs and expressing their relationships to the objects surrounding their daily lives. Still life will be defined as the objects we purchase, own, consume, observe and arrange. Investigations into the still life will be focused on table top, food, found objects, and product photography.Technical explorations include the exposure triangle, depth of field, basic lighting control, framing, and visual design. Class will consist of live-demonstrations, independent studio work, discussions, and photography critiques. Students will complete a portfolio of printed images by the end of the class. A digital camera with manual control, tripod, Lightroom, and Adobe Photoshop will be supplied for this course. Students will be approved into the course after enrollment in SIS. Attendance in first class is mandatory.
Area: Humanities

AS.371.230. Portrait Photography. 3 Credits.
In this course students will gain insight into the art of portraiture with projects such as the self-portrait, collaborative portraiture, portrait of a place, and image and text. In representing people, we'll explore developing an understanding of people in relation to power and representation, the body, environments and society. Lectures on the history of the portrait and its practitioners, new directions in portraiture as well as empathy and the gaze will inspire students to bring greater depth to their image making. Camera experience is a plus but not a requirement. Cameras will be provided for the semester. First class is mandatory.
Area: Humanities

AS.371.234. Oil Painting II. 3 Credits.
Students who have mastered basic painting skills undertake sustained projects, including portrait and plein air landscape work. Slide lectures and handouts deepen students' appreciation of representational traditions. Advanced techniques, materials, and compositional issues are also investigated. Attendance in first class is mandatory.
Prerequisite(s): AS.371.133 or instructor's permission.

AS.371.236. Drawing: The Portrait. 3 Credits.
An intensive look at the traditions and techniques of portrait drawing. Students work from live models in a variety of media and study master portraits by Holbein, Rembrandt, Ingres, Degas, etc. Trips to the Baltimore Museum of Art Print & Drawing Room and JHU Archaeological Museum will enhance knowledge and appreciation of the history and traditions of portraiture. Recommended Course Background: AS.371.131 or permission required. Attendance in first class is mandatory.
Area: Humanities

AS.371.240. Intermediate Digital Photography: Photographic Concepts (Photo II). 3 Credits.
This studio art course will introduce students to conceptual techniques and applications of digital photography. In this course, we will foster creative exploration and uses of technology through advanced digital capture, image construction and manipulation, substrate choices, and methods of digital output. We will have an in-depth look at historic and contemporary photography as it relates to culture, current trends, and classroom assignments. Students will also engage in conversation and classroom critique throughout the semester to aid their dialogue and understanding of contemporary art. Attendance in first class is mandatory. Completion of AS.371.152 is suggested.
Area: Humanities

AS.371.250. Life Drawing. 3 Credits.
An intermediate drawing course focusing on drawing the human form and studying anatomy for artists. Working from live models, students will draw the clothed and nude figure, portrait drawing, gesture drawing and anatomy tracings of the skeleton and muscles. Students will use drawing skills learned in Drawing I to explore the human form using wet and dry material, collage and color. The class will study the figure drawings and paintings from Renaissance to contemporary artists. Attendance in 1st class is mandatory.
Prerequisite(s): AS.371.131 or AS.371.187 or permission of Instructor.
Area: Humanities

AS.371.289. Possibilities (re)structured: Introduction to Mixed Media - 2D and 3D Art Practices.. 3 Credits.
In this course, students will research, investigate, and build art utilizing traditional and non-traditional processes and materials. Students will have the opportunity to expand their knowledge of basic art building materials, including but not limited to found objects, photographs, basic electronics, and consumables. Projects may include assemblages, light 3-D structures, collages, wearables, and hard and soft sculptures. Exploration of materiality as form and content through the lens of contemporary art practices and theory will serve as a reference and a guide for students. Students are encouraged to imagine all possibilities for a structure. Students will provide their own materials for this class. One studio art course is recommended. Attendance in the first class is mandatory.
Area: Humanities

AS.371.290. Introduction to Jewelry and Small Metals. 3 Credits.
This course will provide students with the basic skills needed to design and fabricate their own jewelry and/or small sculpture. Offered at the Baltimore Jewelry Center, a metal + jewelry makerspace in Baltimore City, this course will cover piercing, filing, finishing, fabricating, soldering, forming, basic stone setting, and basic embellishment techniques as well as simple clasps. Designed for beginning sculpture, metals, or jewelry students, the projects may include a pierced pendant or brooch, a hollow constructed ring, a linked bracelet or necklace with clasp, and a bezel-set pendant or brooch. Students will become familiar with the safety, use, and maintenance of studio equipment and hand tools. No prior experience is required for this class. Attendance in the first class is mandatory.
Area: Humanities

AS.371.302. Photographic Portfolio. 3 Credits.
In this upper level course, students will work on a semester-long project. They will develop their ideas within a seminar style format that allows for conversation and debate and provides a forum for the evolution their work. Students will learn advanced techniques in Photoshop, Nik software and Lightroom to enhance content and develop a personal style. Through a combination of critique, lecture, and lab, students will complete a portfolio of ten printed images that work together in a series. Approval for this course will be considered after enrollment on SIS. Attendance in 1st class is mandatory.
Area: Humanities

AS.371.303. Documentary Photography. 3 Credits.

In this course, we will explore different genres and approaches to documentary photography and the questions inherent to this mode of image-making. We will explore such themes as representation, storytelling, research, records and archives, journalism, community engagement, and personal perspective. Contemporary issues within our culture and the local Baltimore community will provide inspiration for the work made in this course. Students will produce a final documentary project on a subject of their choice as the culmination of their semester's work. DSLR cameras are available on loan for the semester. Attendance in first class is mandatory.

Area: Humanities

AS.371.381. Advanced Projects in Visual Art. 3 Credits.

In this studio course, students will create artwork based on their individual research and concerns in art. Through artist presentations, readings, discussions and museum and gallery visit, the students will advance their skills and understanding of contemporary art and theory. This class is open to studio and digital photography students who want to engage with other serious art students and advance their art practice and research. Preferred courses: 2 Studio or Digital classes. The student will provide their own materials. Attendance in first class is mandatory.

Prerequisite(s): AS.371.131 OR AS.371.133 OR AS.371.152 OR AS.371.186

Area: Humanities

AS.371.501. Independent Study. 2 Credits.

Students propose an independent body of work to be created over the course of the semester for one or two credits. Proposals must be sent to the instructor prior to approval for the course.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration, Online Forms.

AS.371.502. Independent Study. 2 Credits.

Students propose an independent body of work to be created over the course of the semester for one or two credits. Proposals must be sent to the instructor prior to approval for the course.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration, Online Forms.

Cross Listed Courses

Anthropology

AS.070.379. Social Ecology Studio. 3 Credits.

This course will grapple with the social and cultural dimensions of contemporary ecological problems through a local, project-based approach. Coursework will be organized on a studio basis in partnership with a local environmental organization, Friends of Stony Run. Continuing a collaborative project initiated in the fall of 2019, we will work together to develop interpretive materials for the Stony Run stream and urban watershed adjoining our campus.

Area: Humanities, Social and Behavioral Sciences

Applied and Computational Mathematics

EN.625.638. Foundations of Neural Networks. 3 Credits.

This course will be a comprehensive study of the mathematical foundations for neural networks. Topics include feed forward and recurrent networks and neural network applications in function approximation, pattern analysis, signal classification, optimization, and associative memories.Prerequisites: Multivariable calculus, linear algebra

Center for Africana Studies

AS.362.140. Blackstorytelling: Public Health in the Black World. 3 Credits.

What about performance offers a unique opportunity to learn from and with communities? How might dramatic performance be used to share information while learning from an audience? This course examines the work and research of young artists from Liberia, West Africa who used street theatre to teach best practices for prevention during the Ebola crisis and considers how their use of dialogical performance contributed to critical knowledge which iteratively informed interventions throughout their awareness campaign. This community engaged course connects public health education efforts in Africa to community health education in Baltimore through the Blackstorytelling tradition with local expert Janice the Griot. Course co-educator and artist Janice the Griot Green will share her firsthand experiences and guide the class through the principles of Blackstorytelling for community change. Students will design public performance projects around local-global community-basedconcerns using the tools they have learned. In partnership with the Great National Blacks in Wax Museum in Baltimore, students will develop performance-based public health messaging drawing on their collection to support community outreach curricular materials development. This performance work will be created collaboratively in workshops during class and in team meetings. Public health researchers who are looking for innovative ways to share their data will gain insights into this experimental ethnographic method and practitioners who want to offer their communities ways to connect best practices to lived experience will develop new pedagogical tools. This is a Community Engagement course in partnership with the Center for Social Concern.

Area: Humanities, Social and Behavioral Sciences

AS.362.309. Performing the Archive 2022: 200 Years of US-Liberia Migration. 3 Credits.

This seminar will explore some of the pivotal historical and contemporary connections between the US and Liberia since the first Black American settlers arrived in West Africa with the American Colonization Society in 1822. This course asks: What are implications of these stories of migration and reception for how we make sense of global anti-Blackness in the contemporary moment? How does performance provoke new questions about shared histories of those impacted by colonialism and the transatlantic slave trade? Why is a more in-depth understanding of 19th century Black political thought and the precolonial West African indigenous category necessary for developing theory on the political economy of race today? Through the lens of performance studies, students will analyze the documents in the American Colonization Society archive, to reimagine these early encounters as informed by historical documentation including folklore and pan-Africanist theory. Through exploring a range of historical and contemporary materials that center the problematic "indigenous/settler" binary, students will engage in a dramaturgical process which presents powerful possibilities for unlearning historical misrepresentations. In particular, students will develop theater-based projects that interrogate the spatio-temporal connections between the stories of both, free Blacks and those who were enslaved in Maryland and manumitted to go to Liberia, and the contemporary politics of Liberia-US migration.

Area: Humanities, Social and Behavioral Sciences

Classics

AS.040.137. Archaeology at the Crossroads: The Ancient Eastern Mediterranean through Objects in the JHU Archaeological Museum. 3 Credits.

This seminar investigates the Eastern Mediterranean as a space of intense cultural interaction in the Late Bronze Age, exploring how people, ideas, and things not only came into contact but deeply influenced one another through maritime trade, art, politics, etc. In addition to class discussion, we will work hands-on with artifacts from the JHU Archaeological Museum, focusing on material from Cyprus.

Area: Humanities

Writing Intensive

Computer Science

EN.605.613. Introduction to Robotics. 3 Credits.

This course introduces the fundamentals of robot design and development with an emphasis on autonomy. Robot design, navigation, obstacle avoidance, and artificial intelligence will be discussed. Topics covered in robot design include robot structure, kinematics and dynamics, the mathematics of robot control (multiple coordinate systems and transformations), and designing for autonomy. Navigation topics include path planning, position estimation, sensors (e.g., vision, ultrasonics, and lasers), and sensor fusion. Obstacle avoidance topics include obstacle characterization, object detection, sensors and sensor fusion. Topics to be discussed in artificial intelligence include learning, reasoning, and decision making. Students will deepen their understanding through several assignments and the term-long robot development project.

EN.605.617. Introduction to GPU Programming. 3 Credits.

This course will teach the fundamentals needed to utilize the ever-increasing power of the GPUs housed in the video cards attached to our computers. For years, this capability was limited to the processing of graphics data for presentation to the user. With the CUDA and OpenCL frameworks, programmers can develop applications that harness this power directly to search, modify, and quickly analyze large amounts of various types of data. Students will be introduced to core concurrent programming principles, along with the specific hardware and software considerations of these frameworks. In addition, students will learn canonical algorithms used to perform high-precision mathematics and data transformations. Class time will be split between lectures and hands-on exercises. There will be two individual projects in both CUDA and OpenCL programming, which will allow students to independently choose demonstrable goals, develop software to achieve those goals, and present the results of their efforts.

EN.605.621. Foundations of Algorithms. 3 Credits.

This follow-on course to data structures (e.g., EN.605.202) provides a survey of computer algorithms, examines fundamental techniques in algorithm design and analysis, and develops problem-solving skills required in all programs of study involving computer science. Topics include advanced data structures (red-black and 2-3-4 trees, union-find), recursion and mathematical induction, algorithm analysis and computational complexity (recurrence relations, big-O notation, NP-completeness), sorting and searching, design paradigms (divide and conquer, greedy heuristic, dynamic programming, amortized analysis), and graph algorithms (depth-first and breadth-first search, connectivity, minimum spanning trees, network flow). Advanced topics are selected from among the following: randomized algorithms, information retrieval, string and pattern matching, and computational geometry. Prerequisite(s): EN.605.202 Data Structures or equivalent. EN.605.203 Discrete Mathematics or equivalent is recommended. Course Note(s): The required foundation courses may be taken in any order but must be taken before other courses in the degree. Students can only earn credit for one of EN.605.620, EN.605.621, or EN.685.621.

EN.605.624. Logic: Systems, Semantics, and Models. 3 Credits.

Traditionally, logic is the study of correct reasoning. In the last few decades, logic has become increasingly important to knowledge representation -- a subfield of artificial intelligence concerned with developing representations of the world (often called ontologies) that aid computers in understanding and making sense of data. This course will promote both a theoretical and practical understanding of logic as a stepping stone for working in contemporary knowledge representation. We will begin with a review of categorical, propositional, and predicate logic. We will then survey modal logics, which include systems that represent necessity and probability, as well as other systems that represent time, and moral notions such as obligation and permissibility. The second half of the course will then introduce the semantic web and ontology engineering. Students will explore the top-level ontology Basic Formal Ontology (BFO) and gain familiarity using mereological and temporal relations. In addition, students will create ontologies in the web ontology language (OWL2) and use the language SPARQL to query knowledge graphs. Students will have the option of writing either a research paper or creating an ontology in OWL with slides as part of a final project.

EN.605.635. Cloud Computing. 3 Credits.

Cloud computing helps organizations realize cost savings and efficiencies without spending capital resources up front, while modernizing and expanding their IT capabilities. Cloud-based infrastructure is rapidly scalable, secure, and accessible over the Internet —you pay only for what you use. So, enterprises worldwide, big and small, are moving toward cloud-computing solutions for meeting their computing needs, including the use of Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). We have also seen a fundamental shift from shrinkwrapped software to Software as a Service (SaaS) in data centers across the globe. Moreover, providers such as Amazon, Google, and Microsoft have opened their datacenters to third parties by providing low-level services such as storage, computation, and bandwidth. This trend is creating the need for a new kind of enterprise architect, developer, QA, and operational professional—someone who understands and can effectively use cloud-computing technologies and solutions. In this course, we discuss critical cloud topics such as cloud service models (IaaS, PaaS, SaaS); virtualization and how it relates to cloud; elastic computing; cloud storage; cloud networking; cloud databases; cloud security; and architecting, developing, and deploying apps in the cloud. The format of this course will be a mix of lectures, and hands-on demos. Upon completing this course, students will have a deeper understanding of what cloud computing is and the various technologies that make up cloud computing, along with hands-on experience working with a major cloud provider. Prerequisite(s): EN.605.202 Data Structures.

EN.605.646. Natural Language Processing. 3 Credits.

This course surveys the principal difficulties of working with written language data, the fundamental techniques that are used in processing natural language, and the core applications of NLP technology. Topics covered in the course include language modeling, text classification, labeling sequential data (tagging), parsing, information extraction, question answering, machine translation, and semantics. The dominant paradigm in contemporary NLP uses supervised machine learning to train models based on either probability theory or deep neural networks. Both formalisms will be covered. A practical approach is emphasized in the course, and students will write programs and use open source toolkits to solve a variety of problems. Course prerequisite(s): There are no formal prerequisite courses, although having taken any of EN.605.649 Introduction to Machine Learning, EN.605.744 Information Retrieval, or EN.605.645 Artificial Intelligence is helpful. Course note(s): A working knowledge of Python is assumed. While some of the assigned exercises can be done in any programming language, we will sometimes provide example code in Python, and many of the labs are best solved in Python.Course note(s): A working knowledge of Python is assumed. While some of the assigned exercises can be done in any programming language, we will sometimes provide example code in Python, and many of the labs are best solved in Python.

EN.605.647. Neural Networks. 3 Credits.

This course provides an introduction to concepts in neural networks and connectionist models. Topics include parallel distributed processing, learning algorithms, and applications. Specific networks discussed include Hopfield networks, bidirectional associative memories, perceptrons, feedforward networks with back propagation, and competitive learning networks, including self-organizing and Grossberg networks. Software for some networks is provided. Prerequisite(s): Multivariate calculus and linear algebra. Course Note(s): This course is the same as EN.625.638 Neural Networks.

EN.605.649. Introduction to Machine Learning. 3 Credits.

Analyzing large data sets ("Big Data"), is an increasingly important skill set. One of the disciplines being relied upon for such analysis is machine learning. In this course, we will approach machine learning from a practitioner's perspective. We will examine the issues that impact our ability to learn good models (e.g., inductive bias, the curse of dimensionality, the bias-variance dilemma, and no free lunch). We will then examine a variety of approaches to learning models, covering the spectrum from unsupervised to supervised learning, as well as parametric versus non-parametric methods. Students will explore and implement several learning algorithms, including logistic regression, nearest neighbor, decision trees, and feed-forward neural networks, and will incorporate strategies for addressing the issues impacting performance (e.g., regularization, clustering, and dimensionality reduction). In addition, students will engage in online discussions, focusing on the key questions in developing learning systems. At the end of this course, students will be able to implement and apply a variety of machine learning methods to real-world problems, as well as be able to assess the performance of these algorithms on different types of data sets. Prerequisite(s): EN.605.202 – Data Structures or equivalent. **Prerequisite(s):** EN.605.202 – Data Structures or equivalent, EN.605.621 – Foundations of Algorithms or EN.685.621 – Algorithms for Data Science or 705.621 – Introduction to Algorithms

EN.605.662. Data Visualization. 3 Credits.

This course explores the underlying theory and practical concepts in creating visual representations of large amounts of data. It covers the core topics in data visualization: data representation, visualization toolkits, scientific visualization, medical visualization, information visualization, flow visualization, and volume rendering techniques. The related topics of applied human perception and advanced display devices are also introduced. Prerequisite(s): Experience with data collection/ analysis in data-intensive fields or background in computer graphics (e.g., EN.605.667 Computer Graphics) is recommended.

EN.605.742. Deep Neural Networks. 3 Credits.

This course provides a practical introduction to deep neural networks (DNN) with the goal to extend student's understanding of the latest and cutting-edge technology and concepts in deep learning (DL) field. DNNs are simplified representation of neurons in the brain that are suited in complex applications, such as natural language processing (NLP), computer vision (CV), speech processing, and many other predictive models rising from non-linear and unstructured data, including text, images, video, audio. The course starts with a brief review of machine learning (ML) and neural networks (NN), including anatomy of neural networks, model evaluation techniques and feature engineering in Python with TensorFlow (TF) and Keras. It then defines and exemplifies the deep learning with convolutional neural networks (CNN), recurrent neural networks (RNN), long-short term memory (LSTM) networks with attention mechanism, generative adversarial networks (GAN) and deep reinforcement learning (DRL), and transfer learning among other key concepts. This is a hands-on course with significant Python coding requirements. Students will apply neural networks to the computer vision (CV) tasks, natural language processing (NLP) tasks, and domains with structured data. Since DL is a rapidly developing field, the course will also rely on recent seminal publications, which students may be asked to reproduce with small scale datasets as an exercise. Prerequisites: Multivariate calculus, linear algebra, probability/statistics; A neural network OR machine learning course: Examples: EN.605.647, EN.625.638, EN.525.670,EN.605.649, EN.705.601, EN.605.646. A working knowledge of Python is assumed. Prior coding experience data munging, numerical linear algebra, ML, and visualization libraries is highly recommended: Example: Python, Numpy, Pandas, ScikitLearn, Matplotlib.
Prerequisite(s): A course in Machine Learning

EN.605.743. Advanced Artificial Intelligence. 3 Credits.

Many advanced artificial intelligence systems are using both Machine Learning and Symbolic AI to solve subproblems. This course builds on the foundations of EN.605.645 Artificial Intelligence by delving more deeply into those AI algorithms and approaches that go under the name of Good Old Fashioned AI or Symbolic AI. In this course, we will cover logic programming, expert systems and business rules, fuzzy logic, case based reasoning, and knowledge graphs. We will also explore more advanced versions of planning and reinforcement learning algorithms. The instructor may add additional topics as warranted. Prerequisite(s): EN.605.645 Artificial Intelligence or permission of instructor.
Prerequisite(s): EN.605.645 Artificial Intelligence

EN.605.745. Reasoning Under Uncertainty. 3 Credits.

This course is concerned with the problems of inference and decision making under uncertainty. It develops the theoretical basis for a number of different approaches and explores sample applications. The course discusses foundational issues in probability and statistics, including the meaning of probability statement, and the necessity of a rational agent acting in accord with probability theory. We will look at possible generalizations of Bayesian probability, including Dempster-Shafer theory. Next, we will develop algorithms for Bayesian networks—graphical probabilistic models—for exact and approximate inference and consider several application areas. Finally, the course will examine the problem of making optimal decisions under uncertainty. We will explore the conceptual foundations of decision theory and then consider influence diagrams, which are graphical models extending Bayesian networks to the domain of decision analysis. As time permits, we will also look at Bayesian games and Markov decision processes. Pertinent background in probability and theoretical computer science is developed as needed in the course.

EN.605.746. Advanced Machine Learning. 3 Credits.

This course focuses on recent advances in machine learning and on developing skills for performing research to advance the state of knowledge in machine learning. The material integrates multiple ideas from basic machine learning and assumes familiarity with concepts such as inductive bias, the bias-variance trade-off, the curse of dimensionality, and no free lunch. Topics range from determining appropriate data representations and models for learning, understanding different algorithms for knowledge and model discovery, and using sound theoretical and experimental techniques in assessing learning performance. Specific approaches discussed cover nonparametric and parametric learning; supervised, unsupervised, and semi-supervised learning; graphical models; ensemble methods; and reinforcement learning. Topics will be discussed in the context of research reported in the literature within the previous two years. Students will participate in seminar discussions and will present the results of a semester-long research project of their own choosing.
Prerequisite(s): EN.605.649 Introduction to Machine Learning; multivariate calculus;Students cannot receive credit for both EN.605.746 and EN.625.742

EN.605.747. Evolutionary and Swarm Intelligence. 3 Credits.

Recently, principles from the biological sciences have motivated the study of alternative computational models and meta-heuristic approaches to problem solving. Proceeding from a machine learning perspective, this course explores how principles from theories of evolution, natural selection, and swarming behavior can be used to construct machines that exhibit nontrivial behavior. In particular, the course covers techniques from evolutionary computation and swarm intelligence for developing software agents capable of solving problems as members of a larger population of agents. Specific topics addressed include representation and schemata; selection, reproduction, and recombination; theoretical models of computational intelligence; optimal allocation of trials (i.e., bandit problems); search, optimization, and machine learning; evolution of programs; population and swarm dynamics; and emergent behavior. Students will participate in seminar discussions and will complete and present the results of an individual project.
Prerequisite(s): EN.605.649 Introduction to Machine Learning; multivariate calculus.

Cybersecurity

EN.695.637. Introduction to Assured AI and Autonomy. 3 Credits.

In order to drive a future where artificial intelligence (AI) enabled autonomous systems are trustworthy contributors to society, these capabilities must be designed and verified for safe and reliable operation and they must be secure and resilient to adversarial attacks. Further, these AI enabled autonomous systems must be predictable, explainable and fair while seamlessly integrated into complex ecosystems alongside humans and technology where the dynamics of human-machine teaming are considered in the design of the intelligent system to enable assured decision-making. In this course, students are first introduced to the field of AI, covering fundamental concepts, theory, and solution techniques for intelligent agents to perceive, reason, plan, learn, infer, decide and act over time within an environment often under conditions of uncertainty. Subsequently, students will be introduced to the assurance of AI enabled autonomous systems, including the areas of AI and autonomy security, resilience, robustness, fairness, bias, explainability, safety, reliability and ethics. This course concludes by introducing the concept of human-machine teaming. Students develop a contextual understanding of the fundamental concepts, theory, problem domains, applications, methods, tools, and modeling approaches for assuring AI enabled autonomous systems. Students will implement the latest state-of-the-art algorithms, as well as discuss emerging research findings in AI assurance.

Data Science

EN.685.621. Algorithms for Data Science. 3 Credits.

This course provides a survey of computer algorithms, examines fundamental techniques in algorithm design and analysis, and develops problem-solving skills required in all programs of study involving data science. Topics include advanced data structures for data science (tree structures, disjoint set data structures), algorithm analysis and computational complexity (recurrence relations, big-O notation, introduction to complexity classes (P, NP and NP-completeness)), data transformations (FFTs, principal component analysis), design paradigms (divide and conquer, greedy heuristic, dynamic programming), and graph algorithms (depth-first and breadth-first search, ordered and unordered trees). Advanced topics are selected from among the following: approximation algorithms, computational geometry, data preprocessing methods, data analysis, linear programming, multi-threaded algorithms, matrix operations, and statistical learning methods. The course will draw on applications from Data Science. Course Prerequisite(s): EN.605.201 Introduction to Programming Using Java or equivalent. EN.605.203 Discrete Mathematics or equivalent is recommended. Course Note(s): This required foundation course must be taken before other 605.xxx courses in the degree. This course does not satisfy the foundation course requirement for Bioinformatics, Computer Science, or Cybersecurity. Students can only earn credit for one of EN.605.620, EN.605.621, or EN.685.621.

Electrical and Computer Engineering

EN.525.661. UAV Systems and Control. 3 Credits.

This hardware-supplemented course covers the guidance, navigation- and control principles common to many small fixed-wing and multirotor unmanned aerial vehicles (UAVs). Building on classical control systems and modeling theory, students will learn how to mathematically model UAV flight characteristics and sensors, develop and tune feedback control autopilot algorithms to enable stable flight control, and fuse sensor measurements using extended Kalman filter techniques to estimate the UAV position and orientation. Students will realize these concepts through both simulation and interaction with actual UAV hardware. Throughout the course, students will build a full 6-degree-of-freedom simulation of controlled UAV flight using MATLAB and Simulink. Furthermore, students will reinforce their UAV flight control knowledge by experimenting with tuning and flying actual open-source quadrotor UAVs. Prerequisite(s): Background in control systems (e.g., EN.525.609 Continuous Control Systems) and matrix theory along with a working knowledge of MATLAB. Experience using Simulink is desired. Existing familiarity with C programming language, electronics, and microcontrollers will be helpful but is not required.

EN.525.670. Machine Learning for Signal Processing. 3 Credits.

This course will focus on the use of machine learning theory and algorithms to model, classify, and retrieve information from different kinds of real world signals such as audio, speech, image, and video. **Prerequisite(s):** EN.525.627 Digital Signal Processing and EN.525.614 Probability and Stochastic Processes for Engineers

EN.525.724. Introduction to Pattern Recognition. 3 Credits.

This course focuses on the underlying principles of pattern recognition and on the methods of machine intelligence used to develop and deploy pattern recognition applications in the real world. Emphasis is placed on the pattern recognition application development process, which includes problem identification, concept development, algorithm selection, system integration, and test and validation. Machine intelligence algorithms to be presented include feature extraction and selection, parametric and non-parametric pattern detection and classification, clustering, artificial neural networks, support vector machines, rule-based algorithms, fuzzy logic, genetic algorithms, and others. Case studies drawn from actual machine intelligence applications will be used to illustrate how methods such as pattern detection and classification, signal taxonomy, machine vision, anomaly detection, data mining, and data fusion are applied in realistic problem environments. Students will use the MATLAB programming language and the data from these case studies to build and test their own prototype solutions.
Prerequisite(s): EN.525.614 Probability and Stochastic Processes for Engineers or equivalent. A course in digital signal or imageprocessing is recommended, such as EN.525.627 Digital Signal Processing, EN.525.619 Introduction to Digital Image and Video Processing, 525.643 Real-Time Computer Vision, or 525.746 Image Engineering.

EN.525.733. Deep Learning for Computer Vision. 3 Credits.

Recent technological advances coupled with increased data availability have opened the door for a wave of revolutionary research in the field of Deep Learning. In particular, Deep Neural Networks (DNNs) continue to improve on state-of-the-art performance in many standard computer vision tasks including image classification, segmentation, object recognition, object localization, and scene recognition. With an emphasis on computer vision, this course will explore deep learning methods and applications in depth as well as evaluation and testing methods. Topics discussed will include network architectures and design, training methods, and regularization strategies in the context of computer vision applications. Following a seminar format, students will be expected to read, understand, and present recent publications describing the current state-ofthe-art deep learning methods. Additionally, team projects will give students an opportunity to apply deep learning methods to real world problems.Prerequisite(s): Students should have taken courses in computer vision and machine learning/pattern recognition, have basic familiarity with OpenCV, Python and C++, as well as prior class instruction in neural networks.

EN.525.770. Intelligent Algorithms. 3 Credits.

Intelligent algorithms are, in many cases, practical alternative techniques for tackling and solving a variety of challenging engineering problems. For example, fuzzy control techniques can be used to construct nonlinear controllers via the use of heuristic information when information on the physical system is limited. Such heuristic information may come, for instance, from an operator who has acted as a "human-in-the-loop" controller for the process. This course investigates several concepts and techniques commonly referred to as intelligent algorithms; discusses the underlying theory of these methodologies when appropriate; and takes an engineering perspective and approach to the design, analysis, evaluation, and implementation of Intelligent Systems. Fuzzy systems, genetic algorithms, particle swarm and ant colony optimization techniques, and neural networks are the primary concepts discussed in this course, and several engineering applications are presented along the way. Expert (rule-based) systems are also discussed within the context of fuzzy systems. An intelligent algorithms research paper must be selected from the existing literature, implemented by the student, and presented as a final project. Prerequisite(s): Student familiarity of system-theoretic concepts is desirable.

EN.525.786. Human Robotics Interaction. 3 Credits.

This course provides an investigation of human-robot interaction and prosthetic control, with a focus on advanced man-machine interfaces including neural signal processing, electromyography, and motion tracking interfaces for controlling and receiving feedback from robotic devices. The course will also cover human physiology and anatomy, signal processing, intent determination, communications between the human and the device, haptic feedback, and telepresence. It is designed to be a hands-on course with class time spent in the dedicated robotics lab designing interfaces and performing experiments in a Virtual Integration Environment (VIE) and with robotic devices. Additional time in the lab, outside of class time, may be required to complete the course project. Programming for the class will be in MATLAB and Simulink.Prerequisite(s): Linear algebra, ordinary differential equations, and programming experience with Python or MATLAB

Energy, Resources & Environment

SA.680.680. Introduction to Energy, Resources & Environment. 4 Credits.

This course introduces students to the fundamentals of energy, resources and environment. It covers a wide range of topics from the functioning of electricity markets to the challenge of climate policy and the management of air pollution. It also introduces a host of key concepts and analytical frameworks that underpin policy analysis in the field, such as notions of collective action and the role of regulatory agencies in monopolistic markets. The course pays particular attention to the energy-environment nexus, including the challenge of low-carbon development in an era of climate change. The course lays the foundation for other courses in the program.

Environmental Health and Engineering

EN.570.367. Sustainability Science and Policy: The Threat of Climate Change. 3 Credits.

The challenge of sustainability is simultaneously promoting human well-being while protecting the environment. Advancing a transition toward sustainability hinges on applying what we know to what we should do, including undergirding public policies with knowledge—especially knowledge gleaned from science, technology, and engineering. This course examines sustainability science, communications, and public policy through the lens of climate—what is known about climate change and impacts, what motivates public understanding, and what actions through mitigation and adaptation make progress toward sustainability.

First Year Seminars

AS.001.129. FYS: Environmental Poisons. 3 Credits.

An exploration of the occurrence and potential effects of poisons in the environment, from naturally occurring ones such as arsenic to those that may be introduced by mankind such as nuclear waste.
Area: Natural Sciences

AS.001.157. FYS: Leonardo da Vinci - Art, Science, and Medicine. 3 Credits.

How does a notary's son trained as a painter gain expertise in the construction of machines and acquire knowledge of the principles of optics, human anatomy, the flight of birds, the dynamics of air and water? How did an artist/engineer who brought few projects to completion come to have such a huge impact on later generations? This First-Year Seminar will focus critically on the myth of Leonardo's singularity while showing his achievements to be characteristic of the artisanal culture of his time.
Area: Humanities

AS.001.162. FYS: From Shakespeare to Baltimore. 3 Credits.

This First-Year Seminar is designed around what is on stage in Baltimore this fall. We will attend several plays, both professional productions at theatres in the city and student productions at JHU. We will pay attention to the interpretation of plays on the page, and to the ways that scripts materialize as performances on the stage. We will place these performances in the context of larger theatre histories, studying great plays from the age of Shakespeare to contemporary American theatre. No acting required – just the desire to explore the theatre of today.
Area: Humanities

AS.001.167. FYS: The Natural History of the Homewood Campus. 3 Credits.

Johns Hopkins University Homewood campus and its surroundings is a wonderful green space in the middle of Baltimore City. This First-Year Seminar will introduce students to both the visible and cryptic organisms living above- and belowground. A combination of observational and sampling techniques will be used to demonstrate how ecologists collect data about plants, insects, and other organisms. In the classroom, these field observations, combined with reading material will be used to discuss global environmental issues including climate change on biodiversity, invasive species, and human impacts on the landscape. By the end of the course students will be able to generate research questions based upon field observations and appreciate the diverse life forms both in Earth and in our backyard. Students should be prepared to spend many hours outside.

Area: Natural Sciences

AS.001.215. FYS: Mosques, Museums, and the Mind's Eye: Discovering Islamic Art in Person. 3 Credits.

Despite its association with distant regions and time periods, Islamic art has a flourishing presence in today's America, represented by rich museum collections, modern buildings designed in historical styles, and vibrant scholarly networks. This seminar explores how we, from the vantage point of twenty-first-century Baltimore, might experience works of Islamic art in ways that are informed by their own cultural contexts while also acknowledging the challenges involved in bridging this gap. We will spend much of the course engaging with objects and architecture in person, with visits planned to the recently reinstalled Islamic galleries at the Walters Art Museum in Baltimore, the Islamic Center of Washington, DC, and the Metropolitan Museum of Art in New York. You will be invited to handle artifacts in person and to try your hand at calligraphy, one of the most distinctive and esteemed Islamic artforms. In the classroom setting, we will read and discuss translations of primary sources written by historical practitioners and consumers of Islamic art, along with examples of modern scholarship that seek to understand the Islamic tradition from a variety of perspectives. As well as learning about such perspectives, you will be encouraged to develop and share—in presentations and written assignments—your own ideas about Islamic art, building on the close, firsthand encounters that run throughout the seminar.

Area: Humanities

AS.001.217. FYS: From Cell Phones to Hydrogen Cars: Are the Needed Metals Sustainable?. 3 Credits.

From cellphones to electric cars, hydrogen cars, and windmills critical metals are needed. Will there be enough and where will they come from? We will discuss questions surrounding the exploration and ownership of metallic resources and their exploitation. Who benefits? Who is adversely affected? To address these questions, we look at individual critical metals and their exploitation in a variety of countries.Experiential investigations of critical metals will take place each Monday to provide material for weekly discussion each Wednesday.Some materials includeBackground knowledge:Craig, J. R., Vaughan, D. J. and Skinner, B. J. (2011) "Earth Resources and the Environment". Prentice Hall, 4th Edn., 508 pp.For investigations: Numerous papers in the literature such asSkinner, B. J. (1976). "Second iron age ahead." Amer. Sci. 64(3): 258-269.Gordon, R. B. et al. (2006). "Metal stocks and sustainability." Proc. Nat. Acad.Sciences 103(5): 1209-1214.Sullivan, D. E. (2006). Recycled cell phones-a treasure trove of valuable metals, Geological Survey (US) fact sheet https://doi.org/10.3133/fs20063097 .Sverdrup, H. U. et al. (2019). "On the long-term sustainability of copper, zincand lead supply, using a system dynamics model." Resources, Conservation & Recycling: X 4: 100007.Plötz, P. (2022). "Hydrogen technology is unlikely to play a major role in sustainable road transport." Nature Electronics 5(1): 8-10.

Area: Natural Sciences

Health Policy and Management

PH.552.601. Foundational Principles of Public Health. 0.5 Credits.

Provides a broad systematic understanding of the executive practice of public health from its inception to modern day. Uses case studies, as well as ethical and public heath practice frameworks to provide students with a grounding in "what is public health practice," why it is important, and why it is contested.

Course location and modality is found on the JHSPH website (https://www.jhsph.edu/courses/).

History

AS.100.340. Asian American Art and Activism: Third World, Feminist, and Queer Solidarities. 3 Credits.

This interdisciplinary course surveys critical themes related to Asian American art and activism including perspectives from history, art and visual culture, literature and gender and sexuality studies.

Area: Humanities, Social and Behavioral Sciences
Writing Intensive

AS.100.410. Decolonizing The Museum: Case Studies. 3 Credits.

How do museums represent the world? The course will focus on the colonial legacy of museums and complicate discourses of decolonization by looking at a range of case studies. We will study the world's fairs, artworks, artifacts, collections, curatorial practices, exhibition histories, repatriation requests, and exhibitionary modes of display, in order to analyze their relationship to histories of decolonization, temporality, translation, untranslatability, spectatorship, provenance, and the life of objects.

Area: Humanities, Social and Behavioral Sciences

AS.100.601. Decolonizing The Museum: Case Studies. 3 Credits.

How do museums represent the world? The course will focus on the colonial legacy of museums and complicate discourses of decolonization by looking at a range of case studies. We will study the world's fairs, artworks, artifacts, collections, curatorial practices, exhibition histories, repatriation requests, and exhibitionary modes of display, in order to analyze their relationship to histories of decolonization, temporality, translation, untranslatability, spectatorship, provenance, and the life of objects.

Area: Humanities, Social and Behavioral Sciences

Interdepartmental

AS.360.339. Planets, Life and the Universe. 3 Credits.
This multidisciplinary course explores the origins of life, planet formation, Earth's evolution, extrasolar planets, habitable zones, life in extreme environments, the search for life in the Universe, space missions, and planetary protection. Recommended Course Background: Three upper level (300+) courses in sciences (Biophysics, Biology, Chemistry, Physics, Astronomy, Math, or Computer Science).
Prerequisite(s): Students may not register for this class if they have already received credit for AS.020.334 OR AS.020.616 OR AS.171.333 OR AS.171.699 OR AS 270.335 OR AS.360.671
Area: Natural Sciences

AS.360.408. Experiential Research Lab: "Holy" Conquest: Religion and Colonization in Sixteenth-Century Mexico. 3 Credits.
"When the Spanish unleashed their regime of colonization of what is present-day Mexico, their primary justification was the religious salvation of Indigenous people. Spaniards, along with other Europeans, arrived by the boatload to impose colonial order, taking up bureaucratic and ecclesiastical positions. The result was far from smooth—the sixteenth-century saw widespread disease, missionary violence on behalf of salvation, crop destruction and the recultivation of land, urban plans that radically altered the environment, the resettlement of entire populations, among other dramatic social and environmental events. This course investigates the complex and dynamic elements of colonial New Spain (as Mexico was called) from an interdisciplinary perspective. It tries to make sense of the chaotic landscape of the first century of Spanish colonial rule in New Spain. It is a research and writing intensive course that serves as an introduction to both the history and art history of this place and moment. Our meetings will act as a springboard for a group trip to Mexico during the January intersession to study objects and spaces in situ. Final projects will relate to materials viewed in person in Mexico. The costs for this trip are included for all students, no fees required. Knowledge of Spanish preferred but not required.
Area: Humanities
Writing Intensive

AS.360.410. Humanities Research Lab: The Dutch Americas. 3 Credits.
The Dutch East India Company, or VOC, is historically and art historically well documented and firmly understood. But the Dutch also had significant holdings to the west via the Dutch West India Company, or WIC. They operated and held outposts in the present-day United States (New York/New Amsterdam), Caribbean (Surinam, Curaçao, Bonaire), Latin America (Brazil), and West Africa. Despite the abundance of materials associated with the WIC from this wide geography, these have been scarcely assessed by art historians, and a defined and comprehensive corpus has never been assembled. This class will act as a research lab in which to do so. In research teams, students will map artworks and objects created from that broad, transnational cultural ambit—categories that might include maps, landscape paintings, still life paintings featuring American flora and fauna, botanical illustrations, plantation architecture, luxury objects made from precious raw materials gathered in the Americas, the urban environment of slavery—and develop individual research questions around them.The class will run with a partner lab in the form of a course led by Professor Stephanie Porras at Tulane University. The course will feature speakers; and there is potential for funded travel to conduct research. We will start at the ground level; no previous knowledge about the field is required. Students from all disciplines are welcome.
Area: Humanities
Writing Intensive

AS.360.610. Humanitites Research Lab: The Dutch Americas. 3 Credits.
The Dutch East India Company, or VOC, is historically and art historically well documented and firmly understood. But the Dutch also had significant holdings to the west via the Dutch West India Company, or WIC. They operated and held outposts in the present-day United States (New York/New Amsterdam), Caribbean (Surinam, Curaçao, Bonaire), Latin America (Brazil), and West Africa. Despite the abundance of materials associated with the WIC from this wide geography, these have been scarcely assessed by art historians, and a defined and comprehensive corpus has never been assembled. This class will act as a research lab in which to do so. In research teams, students will map artworks and objects created from that broad, transnational cultural ambit—categories that might include maps, landscape paintings, still life paintings featuring American flora and fauna, botanical illustrations, plantation architecture, luxury objects made from precious raw materials gathered in the Americas, the urban environment of slavery—and develop individual research questions around them.The class will run with a partner lab in the form of a course led by Professor Stephanie Porras at Tulane University. The course will feature speakers; and there is potential for funded travel to conduct research. We will start at the ground level; no previous knowledge about the field is required. Students from all disciplines are welcome.
Writing Intensive

AS.360.671. Planets, Life and the Universe. 3 Credits.
This multidisciplinary course explores the origins of life, planet formation, Earth's evolution, extrasolar planets, habitable zones, life in extreme environments, the search for life in the Universe, space missions, and planetary protection. Recommended Course Background: Three upper level (300+) courses in sciences (Biophysics, Biology, Chemistry, Physics, Astronomy, Math, or Computer Science).
Prerequisite(s): Students may not register for this class if they have already received credit for AS.020.616 OR AS.020.334 OR AS.171.333 OR AS.171.699 OR AS.270.335 OR AS.360.339.
Area: Natural Sciences

Medicine, Science and the Humanities

AS.145.320. British Visual Culture and Medicine. 3 Credits.
In this class, we will reflect on the ethical, gendered, and societal implications of the creation and exchange of British medical imagery. What purpose did this visual culture serve for artists, practitioners, and patients? How are we meant to look at these images today, outside of their original contexts? We will examine a range of images and objects from Britain, expanding our definition of "art" and interrogating the colonialist roots and origins of artistic and medical material. Our objects of study will extend from oil paintings of renowned physicians to diagnostic photographs of unnamed patients and from prints of gynecological dissection to satirical cartoons of "quack" doctors. We will look not only at how practitioners have had their patients depicted, but also at how those with illnesses or with disabilities have taken back their bodily power to portray themselves. Questions of portraiture, likeness, and consent will be constant themes throughout this course, guiding students' development of ways of thinking critically and writing thoughtfully about medical images.
Area: Humanities
Writing Intensive

Modern Languages and Literatures

AS.210.308. Acting French: learning about French language and culture through theater. 3 Credits.

This course proposes to enhance students' verbal (pronunciation, intonation, syntax, vocabulary) and nonverbal skills (body language, vocal projection, spatial awareness) by performing excerpts from French and Francophone plays ranging from the Middle Ages to the 21st century. A closer analysis of these excerpts will lead us to consider how theater uses the physicality and immediacy of human experience to create a more universal form of connectivity with the world.Recommended course background: AS.210.301.

Area: Humanities

AS.211.224. Made in Italy: Italian style in context. 3 Credits.

Italy and the "Italian style" have become synonym of exquisite taste, class, and elegance thanks to the quality of Italian craftsmanship. This course will explore some of the major factors that contributed to the rise of Italian fashion and Italian industrial design as iconic all around the world. The classes will focus on the main protagonists and art movements that influenced the development of Italian style. We will analyze trends, clothing, and style not only in a historical context, but also through a critical apparatus that will include themes related to gender, culture, power, and politics.The course is taught in English. No knowledge of Italian is required, but those who can read in Italian will have an opportunity to do so. Everyone will learn some Italian words and expressions.

Area: Humanities

AS.211.231. Planet Amazonia: Culture, History, and the Environment. 3 Credits.

Without Amazonia, global warming could reach levels that threaten life on the planet. Yet, in an era of deforestation and climate change, Amazonia itself might be on the verge of disappearance, with disastrous consequences for the world. This course proposes interdisciplinary perspectives on Amazonia through a range of works drawn from history, anthropology, archeology, environmental studies, literature, and the arts. We'll look at texts by European travelers and missionaries who contributed to the paradoxical image of Amazonia as a "virgin paradise" or a "green hell"; scientific studies and artists' depictions of the region's flora and fauna; the often-overlooked history of human occupation of the region; and projects to colonize, develop, or conserve the world's largest tropical forest. What importance does Amazonia hold for Latin American and global geopolitics? How do art and literature, including indigenous writings, create, reinforce, or deconstruct clichés about the region? What alternative futures for our planet can Amazonia help us to imagine?

Area: Humanities

AS.211.315. The Meanings of Monuments: From the Tower of Babel to Robert E. Lee. 3 Credits.

As is clear from current events and debates surrounding monuments to the Confederacy, monuments play an outsize role in the public negotiation of history and identity and the creation of communal forms of memory. We will study the traditions of monuments and monumentality around the world – including statues and buildings along with alternative forms of monumentality – from antiquity to the present day. We will examine the ways that monuments have been favored methods for the powerful to signal identity and authorize history. This course will also explore the phenomenon of "counter-monumentality", whereby monuments are transformed and infused with new meaning. These kinds of monuments can be mediums of expression and commemoration for minority and diaspora communities and other groups outside the economic and political systems that endow and erect traditional public monuments. The first half of the course will examine the theoretical framework of monumentality, with a focus on ancient monuments from the ancient Near East (e.g., Solomon's temple). More contemporary examples will be explored in the second half of the course through lectures and also field trips. We will view contemporary debates around monuments in America in light of the long history of monuments and in comparison with global examples of monuments and counter-monuments. All readings in English.

Area: Humanities

AS.211.327. Ecocinema: Framing Italy's Environmental Crises. 3 Credits.

Over the past decade, growing numbers of filmmakers in Italy have addressed ecological crises in their work. This class takes an eco-critical approach to contemporary Italian cinema, examining a body of compelling place-centered stories that deal with local and global issues. Defining the scope of eco-cinema and the ways we can interrogate films as ecological texts, we shall screen earth-centered films that raise consciousness about the consequences of human manipulation of the natural world; the complicity of industry, government, and organized crime in creating environmental crises; and the effects of economic and social malaise. Screenings include iconic films such as Michelangelo Antonioni's Red Desert (1963), more recent, critically acclaimed films such as Matteo Garrone's Gomorrah (2008), Alice Rohrwacher's Happy as Lazzaro (2018), and many others.

Area: Humanities

AS.211.329. Museums and Identity. 3 Credits.

The museum boom of the last half-century has centered largely around museums dedicated to the culture and history of identity groups, including national, ethnic, religious, and minority groups. In this course we will examine such museums and consider their long history through a comparison of the theory and practice of Jewish museums with other identity museums. We will study the various museological traditions that engage identity, including the collection of art and antiquities, ethnographic exhibitions, history museums, heritage museums, art museums, and other museums of culture. Some of the questions we will ask include: what are museums for and who are they for? how do museums shape identity? and how do the various types of museums relate to one another? Our primary work will be to examine a variety of contemporary examples around the world with visits to local museums including the Jewish Museum of Maryland, the National Museum of African American History and Culture and the National Museum of the American Indian.

Area: Humanities

AS.211.424. Climate Change Narratives: Human and Non-Human Transformative Storytelling. 3 Credits.
In The Great Derangement Indian novelist Amitav Ghosh writes that "the climate crisis is also a crisis of culture, and thus of imagination." Worldwide, climate and environmental change is stirring the imaginary of novelists, filmmakers, and artists who are finding ways to frame, emplot, or even perform, an unmanageable phenomenon like climate change. How is climate change shaping new modes of storytelling and aesthetics? How do film, literature, and environmentally conscious art transform our perception of the world we inhabit and its unpredictable changes? Can climate change narratives help us to imagine futures of possibilities, maybe dystopian, uncertain, or even happy, but futures nonetheless? This multimedia course explores, through a transnational perspective, a variety of contemporary novels, films, and other media that attempt answer these questions.
Area: Humanities

AS.213.332. Literature and the Visual Arts. 3 Credits.
Literature and the Visual Arts is devoted to exploring the resonances between literary and visual forms of artistic expression and their enrichment of the modernist cultural landscape. We will aim to understand how the interest in visual art by modernist writers, and the impressions of literature on modernist and contemporary artworks newly illuminate or challenge traditional aesthetics of the temporality and spatiality of the work, aesthetic judgment, and the phenomenology of aesthetic attention. Readings may include works of literature or aesthetics by Immanuel Kant, Rainer Maria Rilke, Paul Klee, Stefan Zweig, Martin Heidegger, Charles Baudelaire, Walter Benjamin, Maurice Merleau-Ponty, Siegfried Lenz, and Virginia Woolf, alongside work of many visual artists from van Gogh and Cézanne to German Expressionism and Anselm Kiefer. Taught in English.
Area: Humanities

AS.217.425. Latin American Ecocriticism. 3 Credits.
Increased awareness of climate change has led to a shift in the way we address and intervene in environmental issues in the new millennium. Yet the interest in making sense of the environment has a long history in literature and the arts. How have Latin American writers and artists understood and depicted their environments and environmental questions? How do the form and content of texts and cultural artifacts influence our understanding of the non-human world? Can works of fiction shape ecological transformations? In this course we will discuss texts from the early colonial period to the present, including the literary works of Graciliano Ramos, Horacio Quiroga, and Clarice Lispector; political ecology; film; Ana Mendieta's earth-body art; contemporary experiments in bio-art; postcolonial theory; and the intersection of environmental justice with such topics as nationalism and human rights. Going beyond ecocriticism's original focus on the Anglo-American world, we will engage recent scholarship on Latin America that sheds light on the region's cultural and geopolitical importance to the global climate, with particular attention to Brazil. This course aims to introduce students to current debates in Latin American Ecocriticism and the Anthropocene and thus contribute to an incipient but expanding field.
Area: Humanities

Near Eastern Studies

AS.130.153. A (Virtual) Visit to the Louvre Museum: Introduction to the Material Culture of Ancient Egypt. 3 Credits.
This course will present the Egyptological collections of the musée du Louvre in Paris, room by room, as in a real visit. From the Predynastic period, in the 4th millennium BC, to Roman time, the iconic "masterpieces" of this world-renowned art museum, as well as its little-known artifacts, will allow us to explore the history and material culture of ancient Egypt. We will also learn to observe, describe and analyze archaeological objects, in a global manner and without establishing a hierarchy between them, while questioning their place in the museum and its particular language. The objective will be to go beyond the objects themselves and answer, in fine, the following questions: What do these objects tell us about the men and women who produced them, exchanged them, used them, and lived among them in antiquity? What do they also reveal about those who discovered them in Egypt, several millennia later, about those who collected them and sometimes traded them, and what does this say about the relations between Egypt and the Western countries over time? The courses will be complemented by one visit to the JHAM and one visit to the Walters Art Museum; Dr. Aude Semat, curator at The Metropolitan Museum of Art (New York) will also give a lecture about the Egyptian Collections at the MET.
Area: Humanities

AS.130.245. The Archaeology of Gender in the Ancient Eastern Mediterranean. 3 Credits.
How do art historians and archaeologists recover and study genders and sexualities of ancient people? This writing-intensive seminar looks at texts and objects from ancient Egypt, Assyria, and Greece through the lens of gender and sexuality studies. Beyond exploring concepts of gender in the ancient Eastern Mediterranean, students will also consider how modern scholars have approached, recovered, and written about ancient gender identities. There are no prerequisites for this course.
Area: Humanities
Writing Intensive

AS.130.250. Clapping Rivers, Talking Snakes: Nature in the Hebrew Bible and Ancient Middle East. 3 Credits.
How did ancient people relate to their environment—the animals, plants, landscapes, and weather with which they interacted? How have modern binary conceptions of 'nature' and 'culture' or 'human' and 'animal' influenced our interpretation of ancient texts (along with ancient societies)? What is "the zoological gaze?" This course will focus on these questions and more as it investigates conceptions of nature in the texts of the Hebrew Bible, as well as texts and material culture from ancient Egypt, Mesopotamia (modern-day Iraq), and the Levant (modern-day Syria, Lebanon, Palestine, Israel, and Jordan). We will interrogate various interpretive lenses, including Posthumanism, Animal Studies, and Metaphor Theory, as we explore themes such as creation, nature and divinity, and animals in rituals, legal texts, and prophecies, among others. No previous familiarity with Hebrew language or the Hebrew Bible is needed.
Area: Humanities
Writing Intensive

AS.130.378. Geoarchaeology: Applications of Earth Science to Archaeology. 3 Credits.
Geoarchaeology is a multidisciplinary subfield that applies the tools and techniques of earth science to understand ancient humans and their interactions with environments. This course examines basic topics and concepts, including archaeological site formation, paleo-environmental reconstruction, raw materials and resources, soil science, deposition and erosion of wind and water-borne sediments in different environments such as along rivers, lakes and coastlines, radiocarbon and other chronometric dating methods, and ground-based remote sensing, including ground penetrating radar.
Area: Natural Sciences, Social and Behavioral Sciences

AS.130.420. Seminar in Research Methods in Near Eastern Studies. 3 Credits.
This writing intensive seminar examines the relationship between religion and science in ancient Mesopotamia and the rest of the Near East from the 4th millennium to the Hellenistic period. Using a variety of case studies, and through engagement with scholarly literature pertaining to the topic of the course, students will develop skills in specific research skills such as critical reading, analysis, and interpretation.
Area: Humanities
Writing Intensive

AS.131.678. Geoarchaeology: Applications of Earth Science to Archaeology. 3 Credits.
Geoarchaeology is a multidisciplinary subfield that applies the tools and techniques of earth science to understand ancient humans and their interactions with environments. This course examines basic topics and concepts, including archaeological site formation, paleo-environmental reconstruction, raw materials and resources, soil science, deposition and erosion of wind and water-borne sediments in different environments such as along rivers, lakes and coastlines, radiocarbon and other chronometric dating methods, and ground-based remote sensing, including ground penetrating radar.
Area: Natural Sciences, Social and Behavioral Sciences

AS.132.609. Seminar in Research Methods in Near Eastern Studies. 3 Credits.
This writing intensive seminar examines the relationship between religion and science in the ancient world. While the focus will be on religious and scientific practices in Mesopotamia, the topics covered -- which include astronomy and divination, magic and medicine, cosmology, and cartography -- will be examined together with studies in anthropology, sociology, and comparative religion that shed light on the intersection of science and religion in the practices considered in the course. By reading and engaging with a wide range of perspectives on these subjects, students will develop specific research skills such as critical reading, analysis, and interpretation.
Area: Humanities
Writing Intensive

Program in Museums and Society

AS.389.201. Introduction to the Museum: Past and Present. 3 Credits.
This course surveys museums, from their origins to their most contemporary forms, in the context of broader historical, intellectual, and cultural trends including the social movements of the 20th century. Anthropology, art, history, and science museums are considered. Crosslisted with Archaeology, History, History of Art, International Studies and Medicine, Science & Humanities.
Area: Humanities, Social and Behavioral Sciences

AS.389.260. Cultural Heritage in Crisis. 3 Credits.
We explore the possible futures of cultural heritage and museums in times of accelerating climate change, pandemics, armed conflict and political and social turmoil by examining past and contemporary events.
Area: Humanities, Social and Behavioral Sciences

AS.389.315. Ancient Color: The Technologies and Meanings of Color in Antiquity. 3 Credits.
What role did the colorful surfaces of sculptures, vessels and textiles play in the ancient world? We examine historical texts and recent scholarly and scientific publications on the technologies and meanings of color in antiquity, and use imaging and analytical techniques to study polychromed objects from the Johns Hopkins Archaeological Museum
Area: Humanities, Social and Behavioral Sciences

AS.389.322. Tigers to Teapots: Collecting, Cataloging, and Hoarding in America. 3 Credits.
Course will examine the collecting behavior of Americans. Students will explore how collectors have defined the holdings of the nation's museums, galleries, and libraries and used objects to shape taste and status in the U.S.
Area: Humanities, Social and Behavioral Sciences

AS.389.340. Critical Issues in Art Conservation. 3 Credits.
The course examines recent controversies in the conservation of major global art works and sites, raising questions concerning the basic theoretical assumptions, practical methods and ethical implications of art conservation. Cross-Listed with History of Art and Anthropology
Area: Humanities

AS.389.341. Museum Education for Today's Audiences. 3 Credits.
Go behind the scenes of the Baltimore Museum of Art's Education Department and develop and implement programs for college students in conjunction with an exhibition about women and art in early modern Europe.
Area: Humanities, Social and Behavioral Sciences

AS.389.373. Encountering American Art. 4 Credits.
Students investigate the Baltimore Museum of Art's American art collection and its presentation to the public alongside current scholarship on American art to develop strategies for a new permanent collection display that aligns with the museum's commitment to artistic excellence and social equity. M&S Practicum. Co-taught with BMA curator Virginia Anderson.
Area: Humanities, Social and Behavioral Sciences

AS.389.405. Visualizing Africa. 3 Credits.
Examines the history of African art in the Euro-American world, focusing on the ways that Western institutions have used African artworks to construct narratives about Africa and its billion residents.
Area: Humanities, Social and Behavioral Sciences
Writing Intensive

AS.389.420. Curatorial Seminar: Touch and Tactility in 20th century American art. 3 Credits.
As part of an ongoing collaboration with the Baltimore Museum of Art, students are invited to contribute to a special exhibition about touch and tactility in 20th century American art. Research artists such as Jasper Johns, Yoko Ono, Betye Saar, Felix Gonzalez-Torres, create thematic installations, and conceptualize museum interpretation to activate the tactile dimensions of art.
Area: Humanities, Social and Behavioral Sciences

Systems Engineering

EN.645.651. Integrating Humans and Technology. 3 Credits.
This class provides a hands-on introduction to human and cognitive systems engineering. Students will learn and apply user-centered research and innovation methods that are used to discover, document and integrate human capabilities, limitations and needs into the systems engineering process, improving the likelihood that the resulting systems are intuitive, efficient, effective and useful. Topics include needs elicitation, workflow analysis, functional allocation, decision making, prototyping, and performance measurement.
Prerequisite(s): EN.645.662 Introduction to Systems Engineering OR EN.655.662 Introduction to Healthcare Systems Engineering OR EN.675.600 Systems Engineering for Space

For current faculty and contact information go to http://www.jhu.edu/artwork/faculty.htm