WCS-AIP Master's Degree
W+ Course Catalog

Required Courses

Foundations of Inquiry – BIO 654 **Required Summer #1 - 3 credits, Letter Grade**

This course will engage participants in exploring the foundations of inquiry-based learning and teaching while gaining a new familiarity with the Bronx Zoo as an informal science education setting, and with the AIP learning model and online platform. This course will guide students through making observations on zoo grounds, and using those observations as a foundation for completing an independent scientific inquiry project. Participants will further learn how to guide this process with others and how to apply these skills for use in their communities or classrooms to create change and become local leaders. This type of first-hand, experiential learning encourages independent and critical thinking, increasing awareness and concern for the local environment and its inhabitants. We will engage in activities that demonstrate the universal applicability of inquiry in a wide range of settings. Participants will come away with information and techniques for utilizing inquiry in their AIP journey and beyond. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Construct an understanding of the nature of science, and investigate models of inquiry in the life sciences
- Create and conduct their own field research projects
- Engage in reflective and evaluative peer review

Master Plan in Action – BIO 620 **Required Summer #2 – 1 credit, Pass/Fail**

The AIP Master Plan (MP) represents a student's ideas and areas of interest as those ideas relate to the student's professional and community goals. By writing a Master Plan, students are able to focus their AIP journey and visualize the actions and steps that they might take toward completing their master's degree. During this course, with guidance and input from peers and the AIP Cohort advisors, students work on completing their Master Plans. This method ensures that students have a workable plan that helps them anticipate ways to incorporate the projects they create as part of their AIP experiences into their professional and life goals. Students will also think about the common threads and program tenets which tie together the projects in their AIP journey, and that ultimately becomes their final master's ePortfolio -- the culminating experience at the end of their degree. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Develop and expand a focused plan or strategy that includes a timeline for conducting anticipated projects
- Examine, critique, and apply relevant research methodologies

- Conduct critical peer-review of colleague's work
- Use networking and outreach to elevate the outcomes of the Master Plan
- Begin developing a cohesive body of work for inclusion in ePortfolio

<u>Environmental Stewardship in My Community - BIO 656</u> **Required Summer #3 – 3 credits, Letter Grade**

Participants will investigate and participate in conservation opportunities and solutions in their local communities, practice inquiry-based learning, develop a conservation project to be used in their community or classroom, and reflect on their ecological footprint. At the end of this course, participants have a solid understanding of current issues facing local habitats and strategies for empowering their community or students to generate solutions and take action. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Use inquiry to drive learning in science and integrated topics
- Explore the principles of sustainability and community-based conservation
- Use local community resources, including WCS facilities, as learning resources
- Investigate local conservation issues to understand causes and impacts; analyze solutions to these issues
- Develop strategies for engaging students or community members in conservation action

Elective Courses

Animal Behavior and Conservation – BIO 662 **3 credits, Letter Grade**

Investigations of animal behavior comprise a rich field of study. Animals are ideal for comparative observational studies on topics ranging from complex behaviors and adaptations to public engagement with conservation. Students in this course investigate animal behavior through direct observation of the zoo's diverse animal collection to explore key questions about how and why species act the way they do in different situations. This course will provide a foundation for understanding ethological research methods and animal conservation issues that can be applied and adapted to increased understanding about animal welfare and wildlife conservation in a wide range of settings. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Conduct a behavioral studies inquiry investigation
- Engage with and assess multiple data collection instruments and behavioral methodologies
- Determine how ethology helps in maintaining animal health in captive environments, aids in wildlife management, and helps determine conservation needs in the wild

Climate Change – BIO 638 **3 credits; Letter Grade**

Global warming is irrevocably altering our polar ice caps, our oceans, our forests, and the world's plant and animal life. In this course, participants study the science of climate change, the diverse causes of climate change, and the impact of climate change at local, regional, and global scales. Topics include global warming's effect on weather and climate, ice caps, deforestation, and species conservation. Because the public plays a central role in how the world responds to climate change, students also investigate the factors that guide public perception, ranging from media to social interaction. Students explore the effect of climate change specific to the biology of their local region and consider what actions they and their communities can take locally. Through project assignments and research, at the end of this course participants not only have a solid understanding of current issues surrounding climate change but will also have considered and developed strategies for taking action. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Engage with each other and with experts in the field to investigate and interpret global climate change issues.
- Critically analyze primary research on the causes, impacts, and proposed solutions to climate change.
- Evaluate methods by which public perception is formed and consider and critique the polling process, including national and international media and social interaction.
- Gain an understanding of climate change and global warming as a field of study locally and assess how to apply the tools of conservation science in their own communities.
- Become more proficient employing local resources, including the AIP Master Institution environment, exhibits, and community partnerships, to increase public engagement in climate change issues.
- Engage in reflective and evaluative peer review in face-to-face environments and on the web to provide

colleagues with personal insight, new perspectives or analyses, ideas for useful applications, and connections to other research and projects.

Environmental and Informal Science Education – BIO 625 **Summer – 3 credits, Letter Grade**

Participants will explore strategies in Informal Science Education (ISE) and Environmental and Sustainability Education (ESE) programs that not only achieve educational goals but also result in positive environmental impacts. This course will include practical applications and hands-on approaches for conducting ISE and ESE with a wide range of audiences. Participants will explore current and recent historical environmental education research and will create an analytic review of literature related to an area of interest they identify. Putting their new knowledge to work, participants will complete an action research project and measure the impact of the project on their audience. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Examine the history of and evaluate the current body of research on Environmental and Sustainability Education and Informal Science Education as national efforts and fields of study (EPA/NEEA, CAISE, NSF, etc.);
- Research an environmental or sustainability education topic of interest using clear, bounded search parameters and create an analytic review synthesizing the research for a general academic audience;
- Compare the value and use of inquiry in a variety of outdoor and other informal science learning settings (e.g. zoos, aquariums, museums, science centers, out-of-school programs, film and broadcast media, cyber-learning and gaming)
- Choose an audience, and create multiple strategies to engage that audience in a local and/or global conservation action;
- Employ community resources, including the AIP Master Institution environment, and outreach to create connections, build community partnerships and use the network as a learning resource; and
- Engage in reflective and evaluative peer review in face-to-face environments and on the web to provide colleagues with personal insight, new perspectives or analyses, ideas for useful applications, and connections to other research and projects.

Global Biomes – BIO 699.B **3 credits, Letter Grade**

This course serves as an introduction to the biomes, species and cultures connected with WCS's global work. Participants will use WCS parks as a laboratory to explore and understand a wide variety of landscapes, and plant and animal adaptations to these ecoregions. Participants will also explore strategies for engaging in inquiry investigations with species, habitats and conservation.

Participants will gain insights into WCS conservation areas of focus and learn what makes these areas biologically unique. Participants will also engage in discussions about the political, economic and cultural climates of these areas and explore how these factors shape and determine WCS's conservation strategies. Participants will examine and discuss the long-term impacts that WCS strives to achieve in these areas. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Understand the relationship between species and their habitats and the importance of biological diversity

- Investigate climate patterns and plant/animal adaptations characteristic of different biomes
- Use wildlife on zoo grounds to investigate wildlife of select biomes
- Explore current research and conservation issues relevant to different landscapes
- Develop an action plan designed to engage your audience in taking conservation action that will minimize negative human impacts on a select species or biomes.

Graduate Research: Independent Study - BIO 677W **1-3 credits, Pass/Fail**

Students may complete an independent study only with prior approval from their advisor.

This course provides AIP students with the opportunity to do intensive research on a topic or topics that directly contribute to the student's Master Plan. Research may take the form of direct observations but must also include an extensive literature review. The final project includes a written research paper and may include other product (short movie, website, multimedia presentation, etc.). This experience is intended to add depth and insight to the student's master plan and the student is expected to take on significant responsibilities within the chosen independent study topic. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Think critically to research facts and solutions to real world challenges
- Conduct extensive research, synthesize information, and expand on the understanding of the topic
- Reach novel and sound conclusions and ideas based on research information
- Master research skills and develop a final synthesis product

Graduate Research: Internship – BIO 620 **1-3 credits, Pass/Fail**

Students may complete an internship only with prior approval from their advisor.

This course provides AIP students with the opportunity to work one-on-one with zoo professionals and/or community leaders on projects that directly contribute in specific ways to the student's Master Plan and overall master's skill set. The experience is intended to be pragmatic, and the student is expected to take on significant independent responsibilities within the chosen internship. Internships should fall outside the normal day-to-day tasks conducted at students' workplaces. Internships should also be distinctly different than work used in other AIP courses including Master Plan in Action, Masters Capstone, all Leadership Challenges, Community Engagement Labs, and others. Examples of internship projects include analyzing information to share with a public audience, designing a new community outreach initiative, developing community conservation or education programs, and more. Internships may be held at the zoo (e.g., working with a visitor engagement initiative), community organization (e.g., Boys & Girls Clubs, YMCA, Parks Department), or both.

Students will develop the "real-world" skills needed to be productive contributors to their chosen fields of study. Depending on the student's Master Plan, each student will develop a unique set of skills that will enhance their Master Plan objectives. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Think critically to develop solutions to real world challenges
- Develop solutions to complex conservation and/or education problems
- Network and work collaboratively with professionals in their chosen fields
- Identify and refine student-created goals in light of the internship experience
- Develop a unique set of skills that will enhance their Master Plan objectives
- Explore career opportunities and develop a more informed plan for post-graduation success

Graduate Research: Science Literature – BIO 620 **1 credit, Pass/Fail**

Students may repeat this course when offered with different topics; topics offered rotate every year.

In this seminar style class, students will explore contemporary conservation and education issues by reading and discussing current literature. By delving deeper into multi-faceted conservation concerns, participants will have the opportunity to explore how they would respond to controversial problems and conflicts, and how they would help their audience respond. This course will provide participants the opportunity to think critically about the environment and the challenges that arise when striving to deal with complex conservation issues. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Possible Course Topics include:

Perspectives on Conservation Communication

Human Elements in Conservation

Case Studies in Conservation

Outlooks in Education

Student Learning Outcomes:

- Examine contemporary conservation and education issues within historical and present day frameworks
- Develop critical review skills when reading technical and/or popular literature
- Increase leadership skills as moderators of reading discussion

Habitats, Adaptations and Evolution – BIO 694 **3 credits, Letter Grade**

In this course, participants will investigate the conceptual basis of the life sciences and implement strategies for engaging audiences in developing inquiry science skills. Students will use the Bronx Zoo as a laboratory to

explore and understand habitats, adaptations, and introductory evolutionary theory. Through inquiry investigations, participants will explore key questions about diversity and the relationship between species and their habitats. This course will also examine the implications of evolution for species survival. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Explore the history of life on earth through the theory of evolution
- Develop an understanding of the relationship between species and their habitats
- Apply methods for investigating diversity and adaptation to an inquiry based study

Human Dimensions of Conservation: Conservation Psychology – BIO 699.C **3 credits; Letter Grade**

Conserving wildlife is a complex endeavor that requires the integration of sound science from both the social and natural sciences. This course will explore how the social sciences can inform conservation. A growing field of study that draws from several of the social sciences is human dimensions of wildlife. This course will examine how human dimensions emerged as a field of scientific inquiry and why it is important. It will provide an overview of the social science concepts and methods that are the foundation of human dimensions. Students will consider how current conservation issues can be addressed through an understanding of human thought and action. Students will use the human dimensions approach to address a current conservation issue and by the conclusion of the course, they will be able to identify tools, frameworks, and concepts that can be used to influence human behavior to effectively conserve wildlife. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Support the role and importance of human dimensions research and application in wildlife conservation.
- Interpret the foundational social science concepts and theories of human dimensions of wildlife conservation.
- Assess natural resource issues from varying stakeholder perspectives.
- Compare approaches for influencing human behavior and propose considerations for increasing their effectiveness.
- Design a human dimensions study, propose possible methodologies and partnerships, and justify a plan by arguing how study results can be used to aid management decisions.
- Interpret diverse conservation issues and justify human dimensions science applications.
- Employ community resources, including the AIP Master Institution environment, to create connections and use the network as a learning resource.
- Engage in reflective and evaluative peer review in face-to-face environments and on the web to provide colleagues with personal insight, new perspectives or analyses, ideas for useful applications, and connections to other research and projects.

Plants & People – BIO 695 **3 credits, Letter Grade**

As evidenced by the schoolyard ecology movement, educators increasingly realize the power of local environments to engage students in powerful learning experiences that cannot be duplicated in the classroom. Join an emerging, vital conversation about the role of nature in child development and learning, with a particular focus on plants and their use in education. Interact with ecologists, botanists, and classmates, while developing great ideas for using natural and cultivated plant communities in educational programs. Students will complete a semester-long research project to explore emerging, vital conversation about the role of nature in human development and learning, with a particular focus on plants and their use in education; generate knowledge and illuminate the relationship between plants and people. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Course Themes

- Relationships between plants and people
- The use of wild and cultivated spaces in education
- Methods of botanical investigations
- Curricular development and educational leadership
- Inquiry-based learning

Project Design & Assessment – BIO 663 **3 credits ; Letter Grade**

This course instructs students about one of the most important scientific endeavors: evaluation to indicate whether their own work or the work of others is showing a trend and, thus, having an impact. The course is focused on two main sets of evaluation, natural science and social science studies. The course will review statistical thinking and discuss how to construct successful studies that will open students to accurate and effective evaluation. We will discuss how to choose between different statistical tests and the consequences for their experimental design. Students will be engaged in the different ways researchers and others apply statistics to natural science and social science studies. Students conducting social science research will determine whether to conduct qualitative or quantitative studies and will parse out the differences and values of each approach. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Engage with each other to interpret introductory statistical theory and assess statistical tests for their usefulness given different experimental models in a hypothesis testing format.
- Design, conduct, and analyze a research project using appropriate experimental design and statistical analysis.
- Evaluate, choose, and justify statistical tests based on sound experimental design.
- Propose appropriate assessment techniques for a diversity of natural science and social science projects.
- Engage the differences between qualitative and quantitative data collection efforts, and reflect on the appropriate analyses for a study question.

- Interpret, represent, and communicate evaluation products to the public and peers
- Employ community resources, including the AIP Master Institution environment, and outreach to create connections and use the network as a learning resource.
- Engage in reflective and evaluative peer review in face-to-face environments and on the web to provide colleagues with personal insight, new perspectives or analyses, ideas for useful applications, and connections to other research and projects.

Regional Ecology: Ecosystems of the Northeast – BIO 657 **3 credits, Letter Grade**

This course will explore key regional ecosystems and wildlife conservation issues in the Northeast as well as field investigation techniques that scientists and citizens alike can use to study and conserve our local ecoregions and wildlife.

Participants will be introduced to the work of zoo-and aquarium based conservation biologists and researchers from some of WCS's partner organizations to see first-hand how laboratory and field techniques are used to inform important conservation efforts in the Northeast. We will also explore urban ecology and conservation efforts in urban settings. Throughout the course, participants will gain important research skills, develop an understanding of regional wildlife issues and their solutions, and explore techniques to engage their audience in ongoing conservation solutions. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Understand how scientific inquiry is used to address local wildlife conservation challenges
- Develop, conduct, and analyze results from an original ecological field study
- Identify strengths and weaknesses of common field methods employed in wildlife research and conservation
- Investigate conservation practices and programs conducted by local and regional organizations
- Evaluate ways to increase public participation and understanding of regional ecological studies and conservation issues (e.g., citizen science initiatives)

Primate Behavior and Conservation – BIO 696 **3 credits, Letter Grade**

Primates have long fascinated us as a remarkable group in their own right, and for the clues they can shed on our own behavior and cultures. In this course, students will investigate the primate order, with special attention to the WCS collection and the species and landscapes in our conservation focus. Students will have the opportunity to study the taxonomy and evolutionary relationships of this diverse order, as well as their ecology and behavior. We will also focus on conservation issues as they pertain to primate species, including habitat loss, bushmeat, political unrest, and human-wildlife conflict, and we will examine in situ and ex situ conservation strategies. The course will also provide practical applications for the use of inquiry and research methods and explore how course topics can be applied and adapted for teaching and public engagement with a wide range of audiences. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Understand the current taxonomic and evolutionary relationships between primate species, and the current knowledge on primate ecology and behavior
- Distinguish between captive and wild primate behavioral study methodologies, and apply appropriate methods to the completion of a captive primate study
- Conduct an assessment of the current conservation strategies for a particular primate species
- Develop and implement strategies for engaging your audience in global primate conservation action

Urban Ecology – BIO 622 **3 Credits, Letter Grade**

This course is designed to engage students in issues in urban ecology, with specific attention paid to the historical development and long-lasting impacts of urban planning within New York City. Students will utilize historic documents to examine urban development decisions from colonial to modern times. Students will also visit various zoological parks throughout NYC to examine ecological systems found within urban settings through hands-on scientific investigations, such as stormwater management, coastal planning, urban biodiversity, urban population growth, and greenhouse gas emission. As a culminating project, students will collaborate to design visions for the future of New York City utilizing modeling web platforms. Students will be tasked with identifying issues examined throughout the course to address within their vision and must provide both rationale for the planning decisions as well as quantitative data provided by the platform to demonstrate effective change in their given ecological systems. Students will also create ecological challenges to be issued to targeted local populations of potential stewards. *This is a Miami University online course with experiential learning on-site at an affiliated* Dragonfly *Advanced Inquiry Program (AIP) institution.*

Student Learning Outcomes:

- Explore the historical development of New York City, with attention paid to long-lasting effects of historic city planning decisions
- Compare and analyze urban population growth patterns and urban biodiversity data to identify issues to be addressed in urban ecology
- Evaluate various coastal planning strategies employed throughout New York City to identify strengths and weaknesses of each
- Collaborate on a project to reimagine the urban systems within New York City through the use of Visionmaker NYC web platform, specifically attending to carbon, water, and biodiversity systems and the creation of digital challenges to be issued to targeted local audiences of potential stewards
- Employ community resources, including the AIP Master Institution environment, and outreach to create connections, build community partnerships and use the network as a learning resource.
- Engage in reflective and evaluative peer review in face-to-face environments and on the web to provide colleagues with personal insight, new perspectives or analyses, ideas for useful applications, and connections to other research and projects.