

## Interdisciplinary Studies: Concentration in Integrative Conservation

A changing and complex global context and the narrow focus of many previous conservation efforts means that we need to take integrative approaches that balance the conservation and preservation of wildlife and their ecosystems with human wellbeing and in co-design with local communities. By wellbeing we refer to the health, social, environmental, and economic opportunities of peoples who are directly and indirectly connected to conservation action. Our approach to co-design with communities helps to preserve human cultural diversity while also addressing the needs of local peoples and helps to incorporate their ways of knowing and learning into the conception, design, and implementation of conservation projects.

The concentration in integrative conservation provides students with the interdisciplinary training they need to engage a diversity of perspectives and solutions when addressing complex global conservation challenges. The application of this knowledge is reinforced by requiring students to complete coursework in innovation and entrepreneurship and a research project on a real-world conservation issue. This interdisciplinary concentration is designed for students who would like to explore career opportunities related to biodiversity conservation and the maintenance of social-ecological systems in the face of global environmental threats. 37 credits required.

### **1. Introduction to Integrative Conservation** 3 credits

- CONS 201 Introduction to Integrative Conservation (3 credits)

### **2. Quantitative and computational techniques** 3 credits

- CONS 440 Quantitative Methods in Conservation (3 credits)
- Or other approved course

### **3. Biodiversity**

#### (a) Conservation natural science 3 credits

- BIOL 318 Conservation Biology (3 credits; BIOL 204 and BIOL 204L prereqs)
- BIOL 461 Marine Ecology and Conservation (3 credits; BIOL 204 and BIOL 302 prereqs)
- CONS 460 Conservation Behavior (3 credits; CONS 201 or BIOL 204 prereq)
- Or other approved course

#### (b) Conservation geospatial science 3 credits

These courses will meet the major computing requirement.

- CONS 210 Introduction to Conservation GIS (3 credits)
- CONS 420 Conservation GIS (3 credits; CONS 210 or GIS 201 prereq or instructor permission)
- CONS 440 Introduction to Remote Sensing for Conservation (3 credits; CONS 210 or GIS 201 prereq or instructor permission)
- Or other approved course

**4. Communities, voices, and conservation** 3 credits

- CONS 440 Indigenous Voices in Conservation (3 credits; CONS 201 or ENSP 101 or instructor approval)
- CONS 440 Environmental Justice (3 credits; CONS 201 or ENSP 101 or instructor approval prereq)
- CONS 440 Conservation Ethics (3 credits; CONS 201 or ENSP 101 or instructor approval prereq)
- Or other approved course

**5. Human wellbeing and nature** 3 credits

- CONS 440 One Health (3 credits; CONS 201 or ENSP 101 or BIOL 204 prereq)
- CONS 440 Political Ecology of Conservation (3 credits; CONS 201 or ENSP 101 prereq)
- CONS 440 International Development and Conservation (3 credits; CONS 201 or ENSP 101 prereq)
- Or other approved course

**6. Innovation and entrepreneurship in conservation** 3 credits

- CONS 440 Innovation and Entrepreneurship in Conservation (3 credits)
- Or other approved course

**7. Integrative Conservation project** 4 credits

As part of these research courses, students attend a weekly 1-hour meeting where they develop their conservation leadership skills in areas such as: communications, conflict resolution, diplomacy, fundraising, stakeholder engagement, team building, how to run a meeting, how to construct and manage a team and a budget, theories of change. These courses will meet the major writing requirement.

- CONS 490 Conservation Practicum (1-3 credits)
- CONS 491 International Conservation Practicum (1-3 credits)
- CONS 492 Capstone Conservation Practicum (1-3 credits)
- CONS 495 Honors (3 credits)
- CONS 496 Honors (3 credits)
- Or other approved research or independent study course on an applied conservation topic, as determined by the faculty of the Institute for Integrative Conservation (IIC)

**8. Electives** 12 credits

Remaining 12 credits to be taken from any of the 300 or 400-level courses listed above and/or the courses listed below. Choice of electives should be discussed with an academic advisor from the IIC and we encourage students to use their elective courses to develop a specialization or focus within areas of integrative conservation.

- ANTH 250 Introduction to Native Studies (3 credits)
- ANTH 315 Environmental Archaeology (3 credits)
- ANTH 322 Archaeology of North America (3 credits)
- ANTH 324 Native People of the American Southwest (3 credits)

- ANTH 325 Native People of the Great Plains (3 credits)
- ANTH 350 Environmental Anthropology (3 credits)
- ANTH 338 Native Cultures of Latin America (3 credits)
- ANTH 351 Peoples and Culture of Polynesia (3 credits)
- ARTH 430 Art and Environmental Justice (3 credits)
- BIOL 311 Ecology (3 credits; BIOL 203 and BIOL 204 prereqs)
- BIOL 445 GIS for Biologists (3 credits; BIOL 203 and BIOL 204 pre-reqs)
- BIOL 458 Conservation Biology Laboratory (1 credit; BIOL 318 prereq/coreq)
- BIOL 325 Introduction to Quantitative Biology (3 credits; BIOL 203, BIOL 204, and MATH 111 or MATH 131 prereqs)
- BIOL 327 Introduction to Biostatistics (3 credits; BIOL 203, BIOL 204, and MATH 111 or MATH 131 prereqs)
- BUAD 340 Introduction to Innovation and Entrepreneurship (3 credits)
- BUAD 451 Customer Insights for Innovation (3 credits; BUAD 311 or instructor permission prereq)
- BUAD 453 Sustainability Inspired Innovation and Design (3 credits; BUAD 311 or BUAD 340 or instructor permission prereq)
- CONS 440/ANTH 350 Environmental Anthropology (3 credits)
- DATA 141 Programming for Data Science (3 credits)
- ECON 322 Environmental and Natural Resource Economics (3 credits; ECON 101 prereq)
- ECON 307 Principles and Methods of Statistics (3 credits; ECON 101 and ECON 102 prereqs)
- ECON 422 Applied Environmental Economics (3 credits, MATH 111, ECON 308 prereqs)
- ENSP 249 Science and Experience of Ecotherapy (3 credits)
- ENSP 303 Issues in Environmental Ethics (3 credits)
- GOVT 322 Global Environmental Governance (3 credits; ENSP 101 or GOVT 204 prereq)
- HIST 226 The American West since 1890 (3 credits)
- HIST 238 American Indian History since 1763 (3 credits)
- MATH 345 Introduction to Mathematical Biology (3 credits; MATH 211 prereq)
- MSCI 401F Fundamentals of Marine Fisheries (3 credits; BIOL 204 and one of BIOL 330, MSCI 330, or GEOL 330 prereqs)
- PHIL 308 Topics in Environmental Ethics (3 credits)
- SOCL 308 Environmental Sociology (3 credits)
- SOCL 353 Quantitative Research Methods (3 credits; SOCL 352 prereq)
- SOCL 420 Political Ecology of Health (3 credits; CONS 201 or ENSP 101 or BIOL 204 prereq)
- Or other approved course

Recommended sequence for students. Note that prereqs could be met with transfer (or equivalent) credit earned outside of W&M and that prereq recommendations vary according to which advanced courses students intend to enroll in.

#### 1<sup>st</sup> year

Fall: ENSP 101 (optional pre-req), 3 credits  
BIOL 203 and BIOL 203L (optional pre-req), 4 credits  
MATH 111 or 131 (optional pre-req), 3 credits

Spring: BIOL 204 and BIOL 204L (important pre-req), 4 credits  
CONS 201, 3 credits

#### 2<sup>nd</sup> year

Fall: Conservation geospatial science course, 3 credits  
Communities, voices, and conservation course, 3 credits  
ECON 101 (optional prereq), 3 credits

Spring: CONS 440 Quantitative Methods in Conservation, 3 credits  
Human wellbeing and nature course, 3 credits  
Research course possible, 1-3 credits

#### 3<sup>rd</sup> year

Fall: CONS 440 Innovation and Entrepreneurship in Conservation, 3 credits  
Elective, 3 credits  
Research course possible, 1-3 credits

Spring: Conservation natural science course, 3 credits  
Elective, 3 credits  
Research course possible, 1-3 credits

#### 4<sup>th</sup> year

Fall: Elective, 3 credits  
Research course or Honors possible, 1-3 credits

Spring: Elective, 3 credits  
Research course or Honors possible, 1-3 credits

## FAQs

### **Why is this a concentration in Interdisciplinary Studies and how does this relate to the Institute for Integrative Conservation (IIC)?**

Many existing interdisciplinary “major” tracks in A&S are offered as concentrations within Interdisciplinary Studies (e.g. Africana Studies, Computational and Applied Mathematics, Environmental Science & Policy, and several more). This is how we intend to launch this concentration in integrative conservation.

This concentration is staffed by the faculty of the Institute for Integrative Conservation (IIC), which launched in January 2020 as a new model for interdisciplinary programs and is administratively situated in the Provost’s Office. As of February 2022, there are four permanent faculty members of the IIC (three of whom also have appointments in A&S departments: Anthropology, Biology, and Sociology). An additional faculty member will be in place by August 2022, and there are secured funds to hire a further two faculty members in 2023 and 2024, respectively. The faculty staffing of the IIC is a blend of tenure-track faculty with joint appointments in an appropriate W&M “school” (inclusive of A&S) and professional faculty appointments, where those latter faculty are 100% allocated to the IIC so to focus their full teaching, research, and service commitments to the needs of the IIC and this proposed concentration. All IIC faculty members are governed by the regulations and policies described in the Faculty Handbook.

As the IIC is administratively situated in the Provost’s Office and is not in any of the “schools” (inclusive of A&S) of W&M, it cannot offer an academic program by itself. Therefore, the IIC is collaborating with Interdisciplinary Studies in A&S to offer this new concentration in integrative conservation. The concentration is housed solely within A&S but staffed by the IIC.

### **How will you help to promote continuity throughout the concentration and allow for some specialization and focus within the concentration?**

For all CONS-prefix courses we will carefully coordinate and collaborate among IIC faculty members to develop the courses, ensuring that some of the core concepts and frameworks of integrative conservation are referenced in all CONS courses. For example, the intersecting framework of wildlife biodiversity, human wellbeing, and collaboration with local communities will be present in all CONS-prefix courses. This coordination from the outset will give students a more coherent experience of a linked but interdisciplinary concentration.

When involved in research (requirement 7), students will also experience continuity and linking of courses through the required weekly lab meetings that are part of the research experience. Those lab meetings will help to form cohorts of students who are experiencing similar stages of a research project and will support each other in professional development activities.

While we are striving for continuity among CONS courses we will also allow students to choose a specialization within integrative conservation by requiring 12 credits of electives, where the elective courses could relate closely to each other. We have curated this list of electives, largely from A&S departments and programs but also from the School of Business and the Virginia Institute for Marine Science (VIMS), to fit the categories that form the structure of

the concentration (i.e., all of the electives fit into requirements 2 through 6). Hence, all of the electives build on the core requirements of the concentration.

**Have you talked to instructors, departments, and programs about the structure of this concentration and the listing of particular courses?**

We have consulted broadly while designing this concentration. The Institute for Integrative Conservation (IIC) has received input in the design of this concentration from an IIC curriculum working group that consisted of 14 faculty members from across A&S, VIMS, Business, and Law, and from the IIC steering committee. We have also received input from the Dean of A&S Office and the Committee on Honors and Interdisciplinary Studies. For all courses listed, we have reached out to the instructor and/or Chair/Director. In total, we have consulted with and received feedback from more than 45 members of the faculty, at least 14 departments or programs in A&S, and representatives of all the schools of W&M.

We have also received feedback from external conservation organizations and employers (e.g. Conservation International, Wildlife Conservation Society, ReWild, Smithsonian, ConservationXLabs, and Planet Women) as well as other conservation educational programs in Virginia (e.g. Smithsonian-Mason School of Conservation).

**Will you address important environmental threats, such as climate change, in this program?**

Yes, we will weave understanding about the causes of major environmental threats throughout all CONS-prefix courses. Many wildlife conservation programs at other universities and textbooks on conservation use a list of human-caused threats as their organizational structure. We are taking a somewhat different approach in that we are using our approach to and definition of integrative conservation as our organizing structure. Our approach will help students to see the interrelatedness of the threats to biodiversity—as they will understand climate change (as one example) from multiple perspectives across multiple courses.

**Is there demand from students for this concentration?**

Yes, we have already seen robust enrollment in CONS-prefix classes. The introductory course, CONS 201, has filled to 70 students both times it has been offered. The mid-level courses have received enrollments in the 20-38 range. We have received plenty of enquiries and applications from students to enroll in research credits. In addition, we are already working with 12 students to propose and complete self-designed interdisciplinary majors in some individualized variant of integrative conservation.

As far as we are aware, we will be the first integrative conservation undergraduate concentration (or major) in the US. Hence, we anticipate that this concentration can help attract new students to W&M—students that would not normally have attended.

**How many students do you expect in this program?**

We do not expect this to be a large concentration program, with approximately 20 students graduating per year. None of our mid- and upper-level classes will be large (most in the 20-38 max enrollment cap range, which aligns with many A&S department practices), hence we anticipate being easily able to provide all prospective concentrators with suitable research experiences to complete the concentration. If the program is more popular than we are

predicting, we have additional capacity in all of the requirements, including the research requirement, to teach more students.

The anticipated size of the concentration means that we will put minimal enrollment pressures on non-CONS courses that satisfy the elective degree requirements (requirement 8). The intention is to offer sufficient seats in CONS-prefix courses so that we do not overly rely on teaching from other departments and programs. We are hiring more faculty (2-3 over the next 2-3 years, with funding already secured for all hires) to offer further CONS-prefix courses.

**As research opportunities are required, will you prioritize intended/declared concentrators for these applied research projects?**

Yes. As students apply for research opportunities we will talk to them about their major/concentration plans and prioritize those that have either declared or are intending to declare this integrative conservation concentration. We will offer more research opportunities than our anticipated number of concentrators, hence there will be research opportunities for other students too. The collective faculty of the IIC will help to identify and approve suitable applied research experiences for students.

**Why do you have “or other approved course” in every distributional category?**

For every distributional area of the proposed concentration we have added “or other approved course”. This is important to us as the IIC will be hiring several new faculty (from already secured funds) over the next 2-3 years and each of them will be offering new courses that contribute to this concentration—hence the number of CONS-prefix courses in each of the categories will grow. We do not yet know the name and number of those courses but will want them to count for students. Also, this structure allows departments and programs in A&S to offer one-off topics courses and seminars that might be eligible to count toward this concentration. This is quite likely to occur, so we feel this approach gives the IIC, A&S partners, and students more flexibility to meet the requirements for this concentration.

**How much overlap is there with the Environmental Science and Policy (ENSP) program?**

Please note that there are no ENSP-prefix courses listed in non-elective requirements of this concentration. Hence, this proposed concentration includes many topics and courses not included in the ENSP concentration requirements. There is some thematic overlap with the breadth that the ENSP program covers—which we see as a strength of this proposed concentration in integrative conservation. However, this proposed concentration is focused on the intersections of biodiversity—human wellbeing—and local community representation and justice. We encourage students to select a specialization within these socioecological interactions. The ENSP concentration is much broader and covers environmental and sustainability issues outside the scope of the integrative conservation concentration. We should also note that the ENSP concentration is a secondary major (it cannot be a sole, primary major). Hence, we have designed this proposed concentration in integrative conservation to be complementary to ENSP so that students could elect to double major. Many members of the ENSP faculty have contributed to the design of this proposed concentration in integrative conservation.