

Agendum
Oakland University
Board of Trustees Formal Session
April 11, 2025

**BACHELOR OF SCIENCE DEGREE IN ECOLOGY, EVOLUTION & ENVIRONMENTAL
BIOLOGY (EEEB)**
A Recommendation

1. **Division and Department:** Academic Affairs, College of Arts and Sciences, Department of Biological Sciences.
2. **Introduction:** Oakland University proposes a new Bachelor of Science (BS) degree in Ecology, Evolution, & Environmental Biology (EEEB). It's designed for students who wish to pursue careers in ecology, evolutionary biology, and environmental biology. Flexible course requirements are designed to accommodate students seeking careers in various subdisciplines including zoology, botany, conservation biology, agricultural ecology, bioinformatics, ecosystem science, ecological sustainability, and natural resource management. Students will acquire key academic skills needed for jobs in these areas, with an emphasis on designing lab and field experiments, compiling and analyzing data, working in collaborative teams, and communicating ideas in written and oral formats. In addition, this program will support strategic growth in the Department of Biological Sciences at Oakland University, expanding access to ecology and evolution-related research and experiential learning opportunities for both undergraduate and graduate students.
3. **Previous Board Action:** None.
4. **Budget Implications:** The primary source of funding for the program will be undergraduate tuition. The program is expected to generate a net income for the University in every year of operation, with a small dip in net income in Year 2 due to hiring two new full-time employees. By the fifth year of operation, net income is projected to exceed \$475,000. Sustained salary expenses include one full-time instructional faculty member, one clerical/technical assistant, and eight graduate teaching assistants. Operating expenses include marketing and library expenses. The proforma budget is included as Attachment B.
5. **Educational Implications:** The proposed program will make extensive use of existing courses and facilities, requiring minimal new resources to implement. We only need to create two new courses, a new introductory lab and field course (BIO 1301) and a new capstone course (BIO 4974). New courses will be taught in existing laboratory and lecture classrooms. The remaining program requirements will be covered by courses already offered at Oakland University. The offering frequency of introductory and advanced courses will be adjusted based on future course enrollment.

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6. Personnel Implications: To manage the anticipated increase in teaching and administrative load arising from introducing a new capstone course, one new multi-section laboratory course, and additional sections of existing courses, the program will necessitate the hiring of: (1) a full-time faculty member starting from the second year of program operation and (2) one full-time clerical technical staff member from the second year of program operation. Additionally, the annual hiring of eight graduate teaching assistants will be essential to cover projected increases in the number of laboratory sections needed to support the program.

7. University Reviews/Approvals: The proposed program has been reviewed by the College of Arts and Sciences Graduate Committee on Instruction, the Oakland University Senate, and the Executive Vice President for Academic Affairs and Provost.

8. Recommendation:

WHEREAS, the BS in Ecology, Evolution & Environmental Biology degree program is consistent with the objectives contained in Oakland University's Institutional Priorities; and

WHEREAS, the BS in Ecology, Evolution & Environmental Biology degree program will build on the academic and research strengths of the College of Arts and Sciences and provide new educational and community engagement opportunities; now, therefore, be it

RESOLVED, that the Board of Trustees authorizes the College of Arts and Sciences to offer the BS in Ecology, Evolution & Environmental Biology; and be it further

RESOLVED, that the Executive Vice President for Academic Affairs and Provost will complete annual reviews of the BS in Ecology, Evolution & Environmental Biology degree program to evaluate academic quality and fiscal viability to determine whether the program should continue.

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9. Attachments:

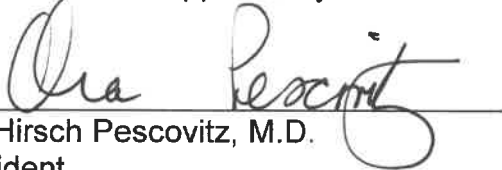
- A. Proposal for the BS of Science Degree in Ecology, Evolution & Environmental Biology program.
- B. Proforma budget for the BS of Science Degree in Ecology, Evolution & Environmental Biology program.

Submitted to the President
on 4/3, 2025 by



Amy Thompson, Ph.D., FESG, CHES
Executive Vice President for
Academic Affairs and Provost

Recommended on 4/4, 2025
to the Board for Approval by



Ora Hirsch Pescovitz, M.D.
President

Reviewed by



Joshua D. Merchant, Ph.D.
Chief of Staff and
Secretary to the Board of Trustees

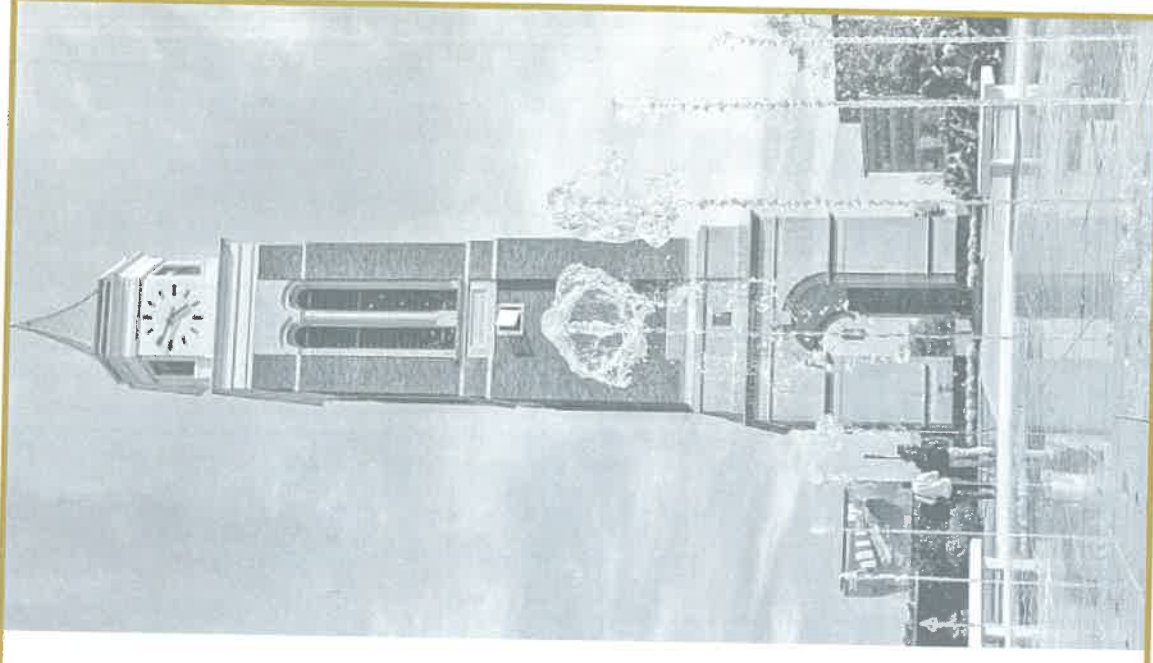
**B.S in Ecology, Evolution,
& Environmental Biology**

Board of Trustees

B.S in Ecology, Evolution, & Environmental Biology (EEEB)

*Department of Biological Sciences
College of Arts & Sciences*

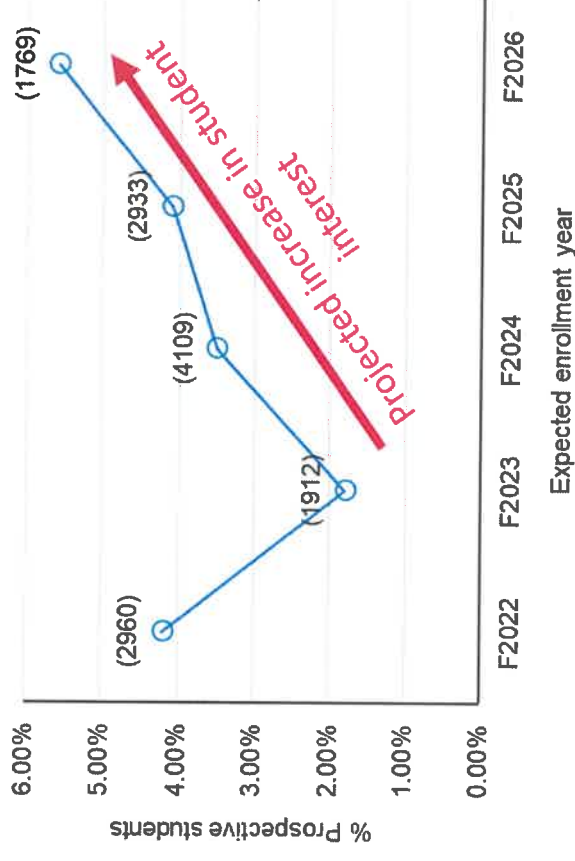
*presented by: Dr. Thomas Raffel
(Associate Professor)*



Summary of Need / Market Analysis

Student Interest Market Analysis (OIRA):

- Data from Southeast Michigan (+ some OH counties)
 - When will students start college, and which programs do they prefer?
- Graph: Students marking EEEB-related majors in their top 3 selections



OU Student Survey (85 responses):

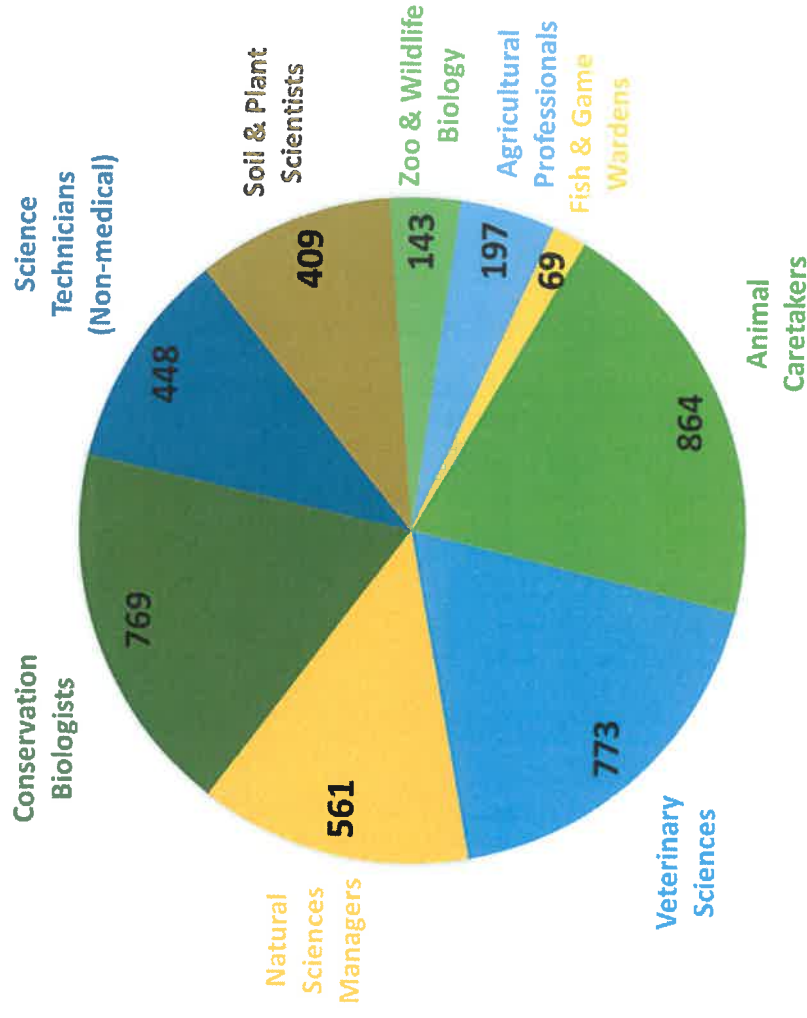
- Would EEEB have been more attractive than your current major?
 - Yes or “maybe”: **67%** (57/85)
- Did someone from your high school attend a different university to enroll in an Eco-Evo major?
 - **Yes: 32** (out of 82 local students)
 - **More than one: 19** (out of 32)

Summary of Need / Market Analysis

OIRA Job Market Analysis (2021):

- 49,555 unique job postings SE-Michigan
 - ~14,709 jobs requiring Bachelors
- >4000 EEEB-specific job types (chart)

EEEEB-ORIENTED JOBS REQUIRING BACHELORS (2021)



Rationale – gap in program offerings!

Biology B.S. Curriculum Mapping project (2019)

Table 1. Program learning outcomes (PLO's) for B.S. in Biological Sciences – Knowledge.

I = "Introduce" (initial coverage of outcome, with no assumption of prior exposure)
 R = "Reinforce" (covering related material that reinforces students of an already-introduced outcome)
 A = "Accomplish" (full achievement of outcome including summative assessment)

Knowledge Learning Outcomes:

Goals: 5x coverage of biological outcomes; 3x coverage of ecological outcomes (K4)

Code	BIO 1200 (Biology I)	BIO 1300 (Biology II)	BIO 1201 (Lab)	BIO 3232 (Biochem)	BIO 3400 (Genetics)	BIO 3540 (Evolution)	Area: Cell & Molecular	Area: Physiol. Systems	Area: Ecol. Systems	Elective Labs (#4)	BIO 4370 (Capstone)	Introduce (#1)	Reinforce (#1)	Accomplish (#3)	Total Coverage
K1 Structure & Function															
K1A	I	I	I	R	R	R	R	R	R	R					2 8 0
K1B	I	I	I	R	R	R	R	R	R	R					2 4 0
K1C	I	I	I	R	R	R	R	R	R	R					1 2 0
K1D	I	I	I	R	R	R	R	R	R	R					2 3 1
K1E	I	I	I	R	R	R	R	R	R	R					2 4 0
K1F	I	I	I	R	R	R	R	R	R	R					1 4 1
K1G	I	I	I	R	R	R	R	R	R	R					1 5 1
K1H	I	I	I	R	R	R	R	R	R	R					1 3 1
K1I	I	I	I	R	R	R	R	R	R	R					1 1 1
K2 Information & Energy Flow															
K2A	I	I	I	R	A	R	R	R	R	R					2 3 1
K2B	I	I	I	R	A	R	R	R	R	R					1 4 1
K2C	I	I	I	R	A	R	R	R	R	R					1 3 1
K2D	I	I	I	R	A	R	R	R	R	R					1 1 1
K2E	I	I	I	R	A	R	R	R	R	R					1 3 1
K2F	I	I	I	R	A	R	R	R	R	R					1 3 1
K2G	I	I	I	R	A	R	R	R	R	R					1 2 1
K2H	I	I	I	R	A	R	R	R	R	R					1 3 1
K2I	I	I	I	R	A	R	R	R	R	R					1 3 1
K2J	I	I	I	R	A	R	R	R	R	R					2 5 0
K3 Ecological Systems															
K3A	I	I	I	R	R	R	R	R	R	R					1 2 0
K3B	I	I	I	R	R	R	R	R	R	R					1 3 0
K3C	I	I	I	R	R	R	R	R	R	R					1 4 0
K3D	I	I	I	R	R	R	R	R	R	R					1 3 0
K3E	I	I	I	R	R	R	R	R	R	R					1 2 0
K3F	I	I	I	R	R	R	R	R	R	R					1 2 0
K3G	I	I	I	R	R	R	R	R	R	R					1 2 0
K4 Evolution															
K4A	I	I	I	R	A	R	R	R	R	R					2 2 1
K4B	I	I	I	R	A	R	R	R	R	R					2 1 1
K4C	I	I	I	R	A	R	R	R	R	R					1 2 1
K4D	I	I	I	R	A	R	R	R	R	R					1 1 1
K4E	I	I	I	R	A	R	R	R	R	R					1 1 1



Cell/molecular, Biochem, Physiology, Genetics
(average coverage = 6.9x)



Ecology (average coverage = 3.6x)



Evolution (average coverage = 5.8x)

➤ Conclusion: Biology B.S. provides great preparation for BIOMEDICAL career paths, but weaker preparation for careers related to Ecology, Evolution, or Environmental Biology

Description of Program

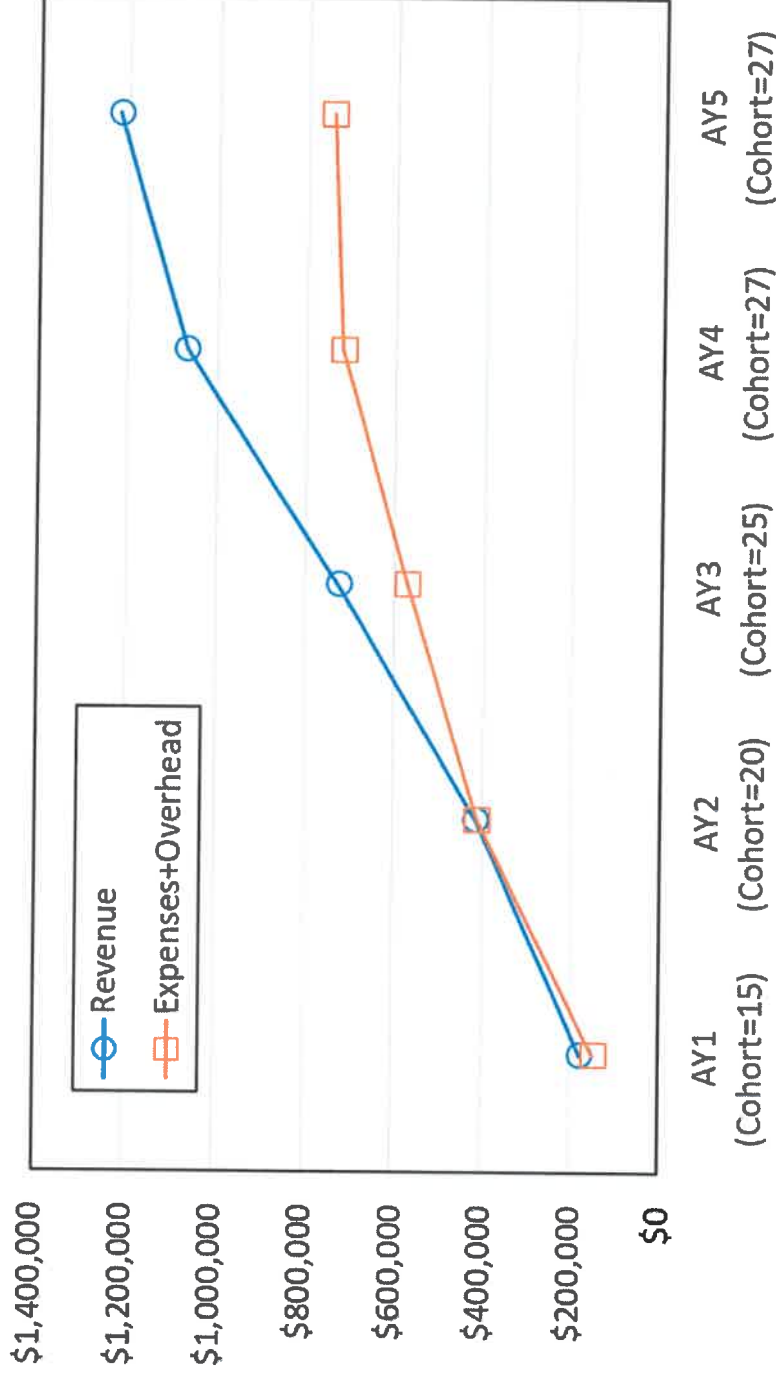
- **Intended program length** – 4 years (8 semesters)
 - 124 credits to graduate (CAS minimum)
- **Reduced core requirements** (relative to Biology BS) – no need for Med School prep
 - **Removed:** Calculus I, Physics II, Organic Chemistry, & Biochemistry
- **Flexible requirements to support multiple career paths**
 - Systematics & Taxonomic Diversity – choose among 9 options
 - Environmental Chemistry – choose among 8 options
 - Increased Elective Credits
- **Develop employer-prioritized skills** (communication, teamwork, & data analysis)
 - Enhanced in-major lab & field requirements (**BIO 1301* Lab**, BIO 3330, BIO 4413 or BIO 4381)
 - **Writing-intensive** courses (three 4000-level courses + **BIO 4974* Capstone**)
 - **Quantitative computing** requirement (BIO 4412 or BIO 4380)

(* approved new courses)

Proforma Budget – “Most Likely” Scenario

EEEB Budget Projection (“Most Likely”)

- \$476,988
Net Income
by Year 5!



ROI - Return on Investment

- **Support Southeast MI** with highly trained graduates in wildlife management, sustainable agriculture, & bioinformatics
- **Prepare students for careers** in zoology, botany, & ecology
- Enhanced opportunities for **independent research** and **experiential learning**
- **Expand connections** with local employers and Biology alumni in EEEB-related
- Expand recruitment to attract and retain a **diverse student population**
- **Increase Retention** by offering enhanced advising, mentoring, networking, and professional development opportunities

Oakland University

NEW UNDERGRADUATE DEGREE PROGRAM PROPOSAL

The new degree program proposal is the principal document used in the approval process and must contain information sufficient for various faculty and administrative bodies within and outside of the university: OU Senate, Board of Trustees, Michigan Association of State Universities (MASU), Higher Learning Commission (HLC), and the US Department of Education (DOE).

Requirements for an undergraduate degree:

- A minimum of 120 credits are required for the bachelor's degree.
- At least 32 of these credits must be at the 3000 level or above
- At least 45 credits must be completed at Oakland University ("residency requirement")
 - Residency requirement for Bachelor of Interdisciplinary Studies is 32 credits
- A cumulative GPA of at least 2.0 in courses taken at Oakland University
 - Program specific GPA requirements can be included
- General education

Process for new academic programs:

1. Proposal for the [authorization to plan](#) a new program originates in and is approved by the department
2. Dean's office consultation: Early drafts are reviewed with Associate and Assistant Deans for suggestions
3. Authorization to Plan
 - a. Proposal is approved by the Dean
 - b. The Dean sends the proposal to provost@oakland.edu
 - c. The Office of the Provost approves for continuation through shared governance, denies, or postpones the proposal
4. With approved authorization to plan, the faculty prepares
 - a. The formal proposal (found on the following page)
 - b. A [full proforma](#)
 - c. An [assessment plan](#)
5. The formal proposal is sent to the School/College curriculum committee for review, discussion, and recommendation
6. With approval, the proposal is sent to the School/College assembly for review, discussion, and recommendation
7. The Dean or designee forwards the proposal, assessment plan, and proforma to the University Senate
 - a. UCUI
 - b. Senate Planning Review Committee
 - c. Senate Budget Review Committee
 - d. Full Senate Review
8. The Provost (as the presiding officer of the senate) recommends to the President
9. The President recommends to the Board of Trustees
10. After BOT approval, the program can advertise with "pending approval" and admit students
11. Review and approval by the Michigan Association of State Universities (MASU)
12. Review and approval by the Higher Learning Commission (HLC)
13. Financial aid can be awarded with DOE approval

Proposed Title of Undergraduate Degree	Bachelor of Science in Ecology Evolution & Environmental Biology
Department(s)	Biological Sciences
School(s)/College	College of Arts and Sciences
Intended Implementation Date	Fall 2025

Provide a brief summary describing the proposed program (250 words max)

The BS in Ecology Evolution and Environmental Biology (EEEB) program is designed for students who wish to pursue careers related to ecology, evolutionary biology, or environmental biology. Students will acquire key academic skills needed for jobs in these areas, with an emphasis on designing lab and field experiments, compiling & analyzing data, working in collaborative teams, and communicating ideas in written & oral formats. Flexible course requirements are designed to accommodate students seeking careers in various subdisciplines including zoology, botany, conservation biology, agricultural ecology, bioinformatics, ecosystem science, ecological sustainability, and natural resource management. Students will be encouraged to consult regularly with academic advisors, faculty advisors, and Career Services to select courses best suited to their specific career goals. The proposed EEEB program is distinct from undergraduate programs currently available at Oakland University, such as the BA/BS in Biology, the BS in Biomedical Sciences (BMS), and the BS in Environmental Science. As discussed below, none of these programs are well suited to prepare students for careers requiring strong backgrounds in ecology, evolution, and organismal biology, nor are they intentionally designed to ensure students acquire key scientific and academic skill sets needed to compete for academic, industry, and government jobs in these areas. The EEEB major is intended to fill this gap by ensuring graduates acquire knowledge and skills needed for success in these career paths. We expect this program to attract students from southeast Michigan who might otherwise attend one of the three Michigan universities that currently offer programs in Ecology and Evolutionary Biology.

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I. Rationale

A. Describe how the program will help promote the mission of the university

The proposed EEEB program will promote the University mission primarily by providing undergraduate students with new educational opportunities to prepare them for career paths related to ecology, evolution, and environmental biology. We currently lack a four-year degree program that prepares students for careers related to these disciplines. This is a notable gap in our program offerings, considering the large number of academic, industry, and government career paths available to university graduates with strong backgrounds in zoology, botany, bioinformatics, agricultural sciences, conservation biology, wildlife management, and ecosystem science. This program will cultivate the full potential of students to succeed in these career paths.

The EEEB program is intentionally designed to help close achievement gaps for first-generation students and students from underrepresented groups. We expanded the introductory lab sequence to better equip students with scientific and academic skills needed to succeed in upper-level coursework. We also have plans to ensure students receive active mentorship from faculty advisors, academic advisors, and Career Services throughout their time at Oakland University.

The EEEB program will expand faculty and student opportunities to conduct academic research related to ecology, evolutionary biology, animal behavior, and agriculture by attracting talented students who are interested in these disciplines.

The EEEB program will contribute to OU's community engagement by encouraging student involvement in service learning, for example by participating in the Student Organic Farm, Pollinator Conservation Organization, and Ecology Club, and through academic courses involving service learning such as Conservation Biology and Applied Organic Farming.

B. Program need:

- Provide evidence of need or workforce demand - Lightcast data ([OIRADA](#)) ***HLC requirement***
- Provide evidence of prospective student funnel data ([Admissions](#)) that reflects student desire for the program
- Describe aspects of the proposal that are unique or distinctive to Oakland

Need for an EEEB program – a gap in our program offerings:

A primary reason for starting an EEEB program is to fill an important gap in our program offerings. We do not currently have an undergraduate program that really serves the needs of students pursuing careers related to ecology, evolution, or environmental biology. The programs that come closest to serving this need are the BA/BS in Biology and BS in Environmental Science programs; however, none of these provide a competitive option for students interested in an EEEB related career. The proposed EEEB program is distinct from these existing programs, as described below.

Comparison with BA/BS in Biology:

We discovered the gap in our program offerings in 2020, when we mapped the curriculum of our existing Biology BA & BS programs. In principle, a general Biology degree might provide students with flexibility to explore many aspects of biological sciences including ecology, evolution, and environmental biology. However, our analysis indicated that the Biology BA/BS majors are designed in ways that prevent most students from fully

achieving EEEB related learning outcomes. The Biology BA/BS majors were primarily designed to prepare students for careers related to biomedical sciences, by ensuring they complete coursework needed to apply to medical or other professional schools (e.g., Organic Chemistry I & II, Physics I & II, Biochemistry, Physics II, and Calculus), and by providing rigorous and repeated coverage of learning outcomes related to cell & molecular biology. However, the Biology B.S. major does not ensure rigorous coverage of EEEB related learning outcomes, especially those related to ecological systems. Furthermore, careers related to ecology, evolution, and environmental biology commonly require job applicants to have already mastered a set of core skills including technical writing, presentation, computational, quantitative analysis, and the ability to work well in collaborative teams. The Biology BA/BS programs do provide some coverage of academic and scientific skills, by requiring students to complete lab and 4000-level lecture courses that include laboratory techniques, written assignments, and analysis of the primary literature. However, students wanting to apply for EEEB related jobs are likely to require specific expertise in technical writing, quantitative computing, and field sampling techniques that do not receive strong coverage in the Biology BS major. Due in part to the need to complete coursework required for medical school admission (e.g., Organic Chemistry & Physics II), Biology BS students have few elective credits available to take field courses or upper-level courses in ecology, organismal, and computational biology that might otherwise help prepare them to apply for EEEB-related jobs. This puts our Biology BA/BS graduates at a disadvantage when directly applying for EEEB related positions in the academic, industry, or government job markets.

Comparison with BS in Environmental Science:

Oakland University offers a BS in Environmental Science (ENV), through the Department of Chemistry. This program includes foundational Biology courses in its core curriculum, but its upper-level coursework emphasizes chemical, physical, and legal aspects of environmental science such as environmental toxicology, pollution, geology, soil conservation, wastewater treatment, and human energy use. ENV students are not required to take courses in genetics, evolution, or organismal biology, and there is limited space for students to take upper-level Biology electives. The ENV program is a good option for students seeking careers managing water and energy resources, but it is less suited to prepare students for careers in zoology, botany, conservation biology, ecology, wildlife management, or agriculture.

Unique aspects of EEEB at Oakland University:

Oakland University is well positioned to offer a strong EEEB major due to already having substantial faculty expertise in ecology, evolution, and environmental biology, including active researchers. We also have unique access to outdoor learning environments on or near campus. OU's geographic location is also an important asset. Unlike many other universities, OU is not located within a metropolitan city center (e.g., Wayne State) or in a small town surrounded by rural landscapes (e.g., Central Michigan Univ). Instead, OU is located in a transition zone between urban and rural landscapes, providing ready access to environments ranging from pristine habitats in nearby state and local parks (e.g., Bald Mountain) to agricultural, suburban, and urban landscapes. On campus, we have access to a large Biological Preserve and the recently named LORACS facility (Laboratory for Outdoor Research Agriculture Conservation & Sustainability), which includes an active Student Organic Farm. EEEB faculty and students will also collaborate with the Native American Advisory Committee (NAAC), exposing students to experiences working with underrepresented groups and sources of indigenous knowledge. These are important

resources to support a program that aims to introduce students to concepts and skills needed to study natural ecosystems, manage wildlife and natural resources, engage in environmental activism with community groups, and engage in rural & urban agriculture.

The EEEB program at OU is also uniquely designed based on mapping program requirements to key knowledge, skills, and disposition learning outcomes. We have intentionally emphasized key communication, collaboration, and quantitative reasoning skills desired by prospective employers, as discussed below. Comparisons of the proposed EEEB major with existing Ecology & Evolution programs at other Michigan universities are provided in a separate section (below).

College Board Prospects data:

We obtained College Board data from Admissions for prospective students interested in majors specifically related to EEEB within our region (SE Michigan + selected OH counties), for prospective students expecting to enroll starting in F2022–F2026. Program codes included in this analysis focused on specifically EEEB-related subjects such as agriculture, food science, zoology, botany, forestry, natural resource management, ecology, marine biology, and outdoor education. The numbers of unique prospects expressing interest in EEEB-related programs for each year in 2022–2026 were: 2960 (7%), 1912 (1.8%), 4109 (3.5%), 2933 (4.1%), and 1769 (5.6%). The percentages are out of the total number of College Board Prospects surveyed for each year. Although there was a dip in interest for F2023, 1.8% of total prospects still represents many prospective students interested in EEEB-related majors. Interest has increased among students expecting to begin college in F2025 (4.1%) and F2026 (5.6%).

Analysis of workforce demand (Lightcast data):

Within our region, there were 49,555 unique job postings related to EEEB from Jan 2010 to Jan 2023 (including program codes for ecology, evolution, systematics, population biology, zoology, and botany). There was a +5.9% increase in 2021-2022, higher than the national average of +3.6%. Job postings included positions in postsecondary education, veterinary assistants and technicians, animal caretakers, natural sciences managers, conservation scientists, wildlife biologists, fish and game wardens, agricultural inspectors and technicians, and forest and conservation workers. Top skills requested by employers included written communication, presentations and proficiency with Powerpoint, problem solving & project management, research skills, data analysis, and proficiency with spreadsheet software. With the exception of "research", these skills appeared more frequently in job postings than in applicant resumes.

Regional trends in EEEB-related degree completions provide additional support for the idea that Oakland University is missing out on an opportunity to attract and retain students. In 2022, Oakland University captured 4.9% of the regional market share in Bachelor's degrees related to general Biology, out of 3725 total completions. However, OU captured 0% of 288 EEEB-related degree completions. Overall, there was a 10.3% increase in EEEB-related degree completions over the past 10 years in this region.

Employer Interest Survey:

We emailed a survey to potential employers of EEEB graduates in the SE Michigan region and received 19 responses. All respondents indicated they are or will be involved in hiring decisions within their organization. Most (17) indicated that they would be very likely to hire graduates from an EEEB program (≥ 3 on a 5-point scale). We will refer to these as "EEEB

employers". EEEB employers were distributed across local, state, & federal agencies (7), non-profit organizations focused on conservation and environmental education (7), and zoos or aquariums (3).

The survey indicated high interest from prospective EEEB employers in knowledge and skill learning outcomes specifically emphasized in the EEEB major. High percentages of EEEB employers indicated that Ecology (48%) and Systematics (39%) knowledge outcomes were "very important" (averaging across outcomes within each category). Even higher percentages said that Communication & Collaboration (71%) and Quantitative Reasoning (54%) skill outcomes were "very important". These corresponded to high averages in these outcome categories, where 1 = "somewhat important" and 3 = "very important" (Ecology: 2.3; Systematics=2.2; Quantitative reasoning=2.3; Communication & collaboration=2.6). On average, evolutionary biology outcomes were "somewhat important" to EEEB employers (1.1). Within the communication & collaboration category, 100% of EEEB employers said that the ability to contribute to teamwork was a "very important" skill. These results reinforced our decisions to emphasize development of these knowledge skills when in the design of the EEEB program requirements (see EEEB Curriculum Map, attached).

Student Interest Survey:

We emailed an anonymous survey to all students who attended EEEB-related Biology courses at Oakland University during the F2023 & W2024 semesters. A total of 85 students completed the survey, including 34.1% freshmen/sophomores and 63.5% juniors or seniors (2.4% recently graduated). Of the respondents, 38.8% were Biology majors, 34.1% ENV majors, 14.1% BMS or Health Sciences majors, and 12.9% other majors.

Many respondents (85.7%) expressed interest in an EEEB related career: 20% zoology; 11.8% ecology or ecosystem science; 11.8% environmental biology; 8.2% evolution or bioinformatics; 8.2% conservation biology; 4.7% agriculture or botany; 20% environmental sustainability or natural resource management. Such high percentages probably reflect a bias in the dataset, where students were more likely to respond to the survey if the EEEB major sounded interesting to them. Nevertheless, the number of interested students indicates potentially strong recruitment potential for the proposed program.

Nearly half (47.1%) of respondents indicated that EEEB would have been more attractive to them than their current major, and an additional 20% said it might be more attractive depending on specific course requirements. There was no significant difference in proportions of Biology versus ENV majors who found new major more attractive than their current major ($X^2 = 0.32$; $P = 0.57$). When asked what course requirements would make the EEEB major seem attractive to them, students frequently requested fewer chemistry, physics, & math courses; more exposure to laboratory and field methods; and more experience with computational data analysis in GIS and Program R.

In comments, some students expressing interest in the EEEB major also expressed dissatisfaction with their current majors. Some even indicated that they currently plan to leave OU to pursue EEEB-related majors. This highlights the potential for a new EEEB major to increase student retention.

To help gauge potential interest from students who did not attend OU, we asked respondents if any of their friends had attended non-OU colleges specifically to enroll in an EEEB related majors. Out of the 82 respondents who attended a high school in SE Michigan, 32 had at least one friend (and 19 had > 1) who attended a different university from OU to major in ecology, evolutionary biology, botany, zoology, or natural resource

management. This represents at least 51 local students who might have considered attending OU if an EEEB major had been available.

C. Discuss career options for students who graduate with the proposed degree

The EEEB program is designed for students who wish to pursue a career related to ecology, evolutionary biology, or environmental biology. This includes jobs in agricultural ecology, bioinformatics, zoology, botany, conservation, ecosystem science, sustainability, or natural resource management. This program will also prepare students to succeed in graduate programs related to ecology, evolution, and environmental biology. We intentionally includes flexible course requirements to accommodate students who are interested in pursuing a variety of specific career paths. Students will be encouraged to consult regularly with faculty advisers, academic advisers, and Career Services to select specific courses that best support their specific career aspirations.

Students who graduate from the EEEB program will be prepared to directly apply for industry jobs related to bioinformatics & genomics, ecological impact assessment, ecological restoration, agriculture, or horticulture. This program will also prepare students to apply for jobs in federal, state, and local government agencies responsible for managing wildlife and other natural resources, such as EGLE, DNR, EPA, USGS, and state & local park systems. There are also jobs available to EEEB graduates in non-profit organizations, such as the Detroit Zoological Society, Belle Island Aquarium, Trout Unlimited, The Nature Conservancy, Six Lands Nature Conservancy, the Clinton River Watershed Council, or Dinosaur Hill Nature Preserve. Many of these organizations were represented in our survey of prospective EEEB employers (see above).

D. Goals and objectives: Provide a list

See attached "Curriculum Map" document for a full list of EEEB program learning outcomes. This document provides tables showing how the proposed course requirements will ensure high coverage of the core program learning outcomes (PLOs), including knowledge, skills, and dispositions that graduates will master by completing this program.

E. Comparison to other similar programs – State/Regional/National

*****MASU requirement*****

- Include links to at least 3 comparable programs within the state and/or nationally
- Describe any overlaps with other programs at O.U. or other Michigan public universities

There are only three universities in Michigan that currently offer undergraduate majors in Ecology & Evolutionary Biology: (1) **University of Michigan's** BS in [Ecology Evolution & Biodiversity](#); (2) **Central Michigan University's** concentration in [Ecology Evolution & Conservation](#) within the Biology BA/BS program; and (3) **Michigan Technological University's** BS in [Ecology & Evolutionary Biology](#). We also included (4) **Ohio State University's** [Evolution and Ecology Major Program](#) (BS) in our analysis.

Importantly, every one of these universities also has separate Biology and Environmental Science programs in addition to their program focusing on Ecology & Evolution.

These four programs share several core requirements in common, including an introductory course in ecology & evolution, general ecology, evolutionary biology, genetics, general chemistry, and biostatistics. Most but not all (3 out of 4) require at least one physics course covering basic mechanics and thermodynamics and, at least one field experience, and at least one taxon-specific organismal biology course (e.g., botany or

taxon-specific zoology courses). Other requirements vary among programs but can include additional organismal biology requirements (2/4), related math courses such as calculus (2/4), data analysis courses (1/4), and courses in social ecology and/or environmental science (1/4). Chemistry requirements vary, with some requiring no additional chemistry and others allowing students to select between biochemistry, organic chemistry, or a course in quantitative analysis. Elective options frequently include courses in botany, zoology, environmental microbiology, environmental chemistry, evolutionary ecology, environmental toxicology, plant physiology, plant-microbe interactions, conservation science, ornithology, mammalogy, herpetology, marine biology, plant systematics and evolution, microbial diversity, and bioinformatics, field botany, and ethnobotany.

The proposed EEEB program will add value to the existing programs in the Midwest by offering a unique blend of courses tailored to the region's ecological diversity, especially the Great Lakes. Oakland University has a particular strength in aquatic ecology, with three of the core research faculty members having expertise in this area (Dr. Tiegs, Dr. Raffel, & Dr. Wagner). Other unique features of the proposed EEEB major include: (1) course requirements mapped to learning outcomes to ensure students develop key scientific and academic skills throughout the major; (2) computational biology lab & lecture requirements; and (3) extra lab and field course requirements focused on developing scientific skills.

II. Academic Unit

A. Describe how the goals of the School/College/Dept are served by the proposed program

The EEEB is designed to ensure students achieve [stated learning goals of the College of Arts & Sciences](#), including: (1) ethically and efficiently use technology to solve problems and complete complex tasks; (2) make decisions and overcome problems by obtaining and interpreting facts and data; (3) effectively use written and oral communication skills; (4) demonstrate openness, inclusivity, sensitivity and respect when interacting with people from various backgrounds; (5) identifying and setting goals for employment; (6) work effectively in a team with multiple viewpoints; and (7) develop effective work habits and integrity.

The EEEB program will serve [stated goals of the Department of Biological Sciences](#) to (1) prepare students for graduate study in the life sciences, research in private and government industries, or professional careers in sciences and education; and (2) grow student passion for the biological sciences through committed faculty research, excellent teaching, and engaged student learning.

B. Describe how existing staff will support the proposed program

This program will make extensive use of existing courses and facilities, requiring minimal new resources. We only need to create two new courses, BIO 1301 and BIO 4974, and these will be taught by existing faculty members in existing laboratory and lecture classrooms. All other courses are pre-existing courses already offered at Oakland University.

C. Faculty qualifications - current scholarly activity of the faculty in the proposed program - **Appendix A for CVs ***HLC requirement*****

Full time faculty who will teach courses to support the new program will include Dr. Tom Raffel (Assoc Prof), Dr. Scott Tiegs (Prof), Dr. Mary Jamieson (Assoc Prof), Dr. Taras Oleksyk (Assoc Prof), Dr. Nicole Wagner (Asst Prof), Dr. Fay Hansen (Assoc Prof), and Dr. Mark Sturtevant (Adj Assoc Prof). Abbreviated CVs are attached.

D. Describe current resources and how the new program will impact existing resources

Existing laboratory classrooms include DH 209/212 to support BIO 1201 & 1301, ODH 115 to support BIO 3320, and MSC 133 to support upper-level Ecology lab courses. Other existing resources to support field courses include the Biological Preserve and the Laboratory for Outdoor Research Agriculture Conservation & Sustainability (LORACS).

The new program will make fuller use of existing laboratory classroom spaces that are currently underutilized. For example, MSC 133 is currently partially scheduled with lecture courses. This is due in part to a recent classroom shortage caused by the South Foundation Hall renovation. However, now that the South Foundation Hall renovation is complete, MSC 133 will become more available to schedule upper-level lab courses to support the EEEB major.

III. Program Plan

A. Admission Requirements

- Unique GPA requirements, if any
- Academic term(s) and deadlines for applications for admission, if any
- Other specific admission requirements

There will be no unique admission requirements or application deadlines for the proposed EEEB program. University admission requirements and application deadlines are provided in the [Catalog](#).

B. Degree requirements *HLC requirement*****

- Courses, credit hours and course prerequisite requirements - **Appendix B**
- Identify new courses to be added and % of a course distance delivered

Course requirements, credits, and co/prerequisites are described in Appendix B and in the proposed Catalog language (attached).

Only two new courses are required to implement this program:

BIO 1301 - Biology Laboratory II (BIO 1301)

BIO 4974 - Ecology and Evolution Capstone

See attached for syllabus descriptions for these two new courses.

C. Intended program length (e.g. four years, 8 semesters, other) *HLC requirement*****

Four years (8 semesters)

D. Potential for collaboration with other units at OU

The program includes required courses currently offered by the departments of Chemistry, Physics, and Mathematics.

The greatest potential for collaboration is with the Chemistry department, which also offers coursework related to Environmental Science. EEEB students are required to take three courses in Chemistry and/or Environmental Science to complete the Environmental Chemistry requirement. Students are also free to take ENV courses to satisfy elective course requirements within the major, in addition to BIO courses.

There may also be potential for collaboration with other units. For example, EEEB majors would benefit from coursework in Environmental Ethics or Animal Ethics, which could be offered in collaboration with the Philosophy department. EEEB majors might also benefit from coursework and research experiences related to animal behavior, which is a point of

overlap between the Biology and Psychology departments. EEEB majors could also benefit from taking elective coursework in applied statistics and computer programming through the Math and Computer Science departments

E. Plan for transfer credits

- Articulations with other community colleges, universities, or other institutions
- Assessment of how regional community college students will transfer to the proposed program

Transferring into the EEEB program will be much like transferring to the existing Biology BS & BA programs, and the EEEB program will not require changes to existing articulation agreements or transfer credit guidance. For example, OU has an articulation agreement and transfer guidance with Oakland Community College for our BIO 1200/1201/1300 sequence, and we do not plan to make changes to these agreements. The only new lower-level course proposed for EEEB is the BIO 1301 laboratory course. We consider this to be a critical core course for EEEB majors that students should take regardless of their prior coursework at other universities.

IV. Curriculum Overview

A. Accreditation: If the program is in an area in which professional or specialized accreditation is available, identify the name of the accreditation agency; indicate the timetable and the resource commitments needed to achieve accreditation.

No professional or specialized accreditation is required for this program, which will be covered by the university's general accreditation with the Higher Learning Commission.

B. The total must equal the number of credits from below; $(b + c) - a = \text{total number of credits}$ *HLC requirement*****

- Number of credits of new courses developed for the new program that haven't been offered at OU (required or elective)
- Number of credits from existing or repackaged inventory of courses at OU
 - Repackaged refers to something such as course ABC 1000 was changed to course XYZ 1000
- Number of credits from courses where content has been revised or redesigned for the new program
 - Concept X was taught in course ABC 1000 and new state requirements are that Concept Y is taught in course ABC 1000
 - Course DEF 2000 is a prerequisite for a new course, DEF 3000. DEF 2000 content needs to be updated to include new information required for DEF 3000.

- Credits from new courses: 5 (BIO 1301 + BIO 4974)
- Credits from existing or repackaged courses: 119 (remaining courses adding up to minimum of 124 to graduate)
- Credits from courses where content has been revised or redesigned: 0

C. Provide typical Plan of Study for students enrolled full-time in the program - Appendix C *HLC requirement*****

See Appendix C

D. Provide course descriptions or syllabi for all new courses in the program - Appendix D *HLC requirement*****

BIO 1301 – Biology Laboratory II (syllabus attached)

(1 credit)

Catalog description: Introduction to fundamental scientific skills including hypothesis development, experimental design, data collection, analysis of biological data, and scientific writing. Laboratory and field activities emphasize ecological dynamics, evolutionary biology, animal behavior, plant and invertebrate anatomy, and biological diversity.

Pre- OR Co-requisite: BIO 1300

BIO 4974 – Ecology and Evolution Capstone (syllabus attached)

(4 credits)

Course description (extended): A synthesis of concepts and skills needed for success in fields related to ecology, evolution, and environmental biology, including the intersection of life sciences with cultural, social, and ethical issues. Students will evaluate how science is communicated in primary literature, technical reports, and popular press. Students will demonstrate skills in teamwork and scientific inquiry through oral and written communication of results from individual and group research projects.

General Education Requirement(s): Satisfies the university general education requirement for a writing intensive course in the major. Satisfies the university general education requirement for the capstone experience.

Prerequisite: WRT 1060 or equivalent with a grade of (C) or higher

Level restriction: Senior standing

E. Academic Progress – Probation – Dismissal, *if applicable*

- Provide criteria by which a student is evaluated on academic progress
- Explain the steps that lead to probation and dismissal from the program

EEEB student progress will be evaluated based on their cumulative GPA in required courses, their regular engagement with faculty and academic advisors, and their achievement of program requirements. Prerequisite requirements ensure that students must achieve a minimum “C” grade (Grade point equivalent = 2.0) in foundational courses before they can progress to upper-level courses.

Per [University policy](#), students will be placed on academic probation if they fall “below a 2.00 cumulative grade point average (GPA)”. Students may be dismissed if they “were on academic probation, attempted 24 or more credit hours, and do not have a cumulative grade point average (GPA) of 2.00”. Further details about the academic probation and dismissal policies are provided in the [Catalog](#).

F. Academic oversight and direction for the program

- Provide the name and position (or title) of the individual who will be responsible for the success of this program, and give the percentage of this individual's time that will be dedicated to the program

The initial Program Coordinator for EEEB will be Dr. Tom Raffel. Dr. Raffel will devote approximately 15% of his time to this position and receive one course release per year (equivalent to 15% effort according to the departmental workload policy).

G. Interdisciplinary programs

- Academic home - primary college/school and department home for the program
- Participating academic units
- Statement of support from the Deans and department chairs with responsibility for providing courses and faculty for the program.

The academic home for this program will be in the Department of Biological Sciences, in the College of Arts and Sciences.

H. Primary target audience for the program (e.g., full-time, part-time, traditional college age, working adults, transfer students, military personnel)
*****HLC requirement*****

The primary target audience is full-time students and transfer students of traditional college age. However, this program may also appeal to part-time students and students in older demographics.

I. Source of Students (e.g., new target population, current enrollment shift, local community demand) *****MASU requirement*****

Based on our student interest survey, we anticipate some degree of enrollment shift from our current degree programs, especially from the Biology BA/BS majors and the ENV major. However, we believe there exists a large population of local high school students who are interested in EEB-related career paths and currently traveling outside the region to attend universities that offer majors in ecology, evolution, environmental biology, botany, zoology, or wildlife management. We want to make Oakland University the school of choice for these students, who would otherwise have attended other universities, and we believe these will comprise the majority of new EEB majors.

J. Recruitment Plan

We will work with UCM to develop marketing materials to advertise the EEB program, including digital media, Facebook/Instagram ads, Instagram stories & reels, and paid search (e.g., Google AdWords). We will work together to generate content including student & faculty stories, original photoshoots in labs & classrooms, marketing copy for the OU website, lists of keywords for search engine optimization, involving faculty in media stories related to the program, and participation in academic visit days & admissions events. See UCM Marketing Report for details (Appendix I).

K. Planned enrollment

- How has the estimated program demand been factored into realistic enrollment projections? *****HLC requirement*****
- Describe how demand has been used in planning and budgeting to develop a quality program that can be sustained? *****HLC requirement*****
- What future growth is anticipated and how will it be managed? *****HLC requirement*****
- Describe how this proposal will shift current students from current programs (which programs) vs. attracting new students
- Provide evidence of student enrollment at peer institutions that offer the same/similar program using data obtained from IPEDS ([OIRADA](#))

To estimate the expected ratio of EEB majors to Biology majors, we used available data on numbers of degrees awarded at Central Michigan University (CMU) in 2021-2022. The ratio of EEB majors to Cell & Molecular Biology + BMS + Biochemistry majors at CMU was 0.23. We then assumed the ratio of EEB majors to Biology + BMS + Biochemistry majors would be close to this 0.23 ratio. To estimate the number of new enrollments per year, we added up the Biology + BMS + Biochemistry new enrollments at OU for 2021-2023 (222; 190; 180) and multiplied the average by 0.23 to estimate numbers of new EEB majors who might have enrolled each year if the program had been available ($197 \times 0.23 = 45.4$). To generate an estimate of the "most likely" number of new-to-OU EEB enrollments, we

assumed 60% of these students would be “new to OU” (i.e., would not have otherwise enrolled at OU), resulting in an estimate of $0.6 * 45.4 = 27.2$ new enrollments per year once the program has reached equilibrium. We assumed initial enrollments would begin smaller than the eventual equilibrium, resulting in the following **estimated new enrollments for the first five years: 15 (year 1), 20 (year 2), 25 (year 3), 27 (year 4), 27 (year 5).**

We also explored best and worst-case scenarios, estimating equilibria of 40 new enrollees per year in the best-case scenario and 15 new students per year in the worst-case scenario.

We planned for the new SI and CT positions to begin in year 2 of the program to accommodate these projected increases in enrollment, and we developed the Pro Forma Budget based on these projections.

Based on student survey data (see above) we anticipate that some students who enroll in EEEB will be drawn from the pool of students who would have previously enrolled in the Biology BA/BS or ENV programs. We expect approximately equal numbers of students to shift from each of these existing majors, given that Biology and ENV majors were equally likely to express a preference for an EEEB major in response to our survey. We anticipate that students shifting from other majors will represent less than 40% of enrollees in the new EEEB major, based on the high fraction of local survey respondents whose friends attended non-OU universities specifically to enroll in EEB-related majors.

L. Advising students

- Describe the current academic advising structure and how the new program will be supported by advising
- Provide the current academic adviser:student ratio

The advising structure for EEEB will be a dual model, similar to the current Biomedical Sciences (BMS) and Biology BS/BA majors. Students are encouraged to meet regularly with both their CAS academic advisers and Biology faculty advisers for support with various needs. Students may see their academic adviser for support with: (1) exploring passions, talents, & goals; (2) exploring and selecting majors and other academic programs; (3) selecting courses; (4) involvement in co-curricular activities; (5) explaining University policies & procedures. Students may consult with faculty advisers for help with: (1) exploring passions, talents, & goals; (2) selecting courses within the major; (3) involvement in co-curricular activities; and (4) expertise within their major field of student.

As of March 2024, the current overall student to CAS adviser ratio is 498:1, and the ratio of Biology students to CAS advisers is 61:1. There are 398 students currently enrolled in a Biology major. Students enrolled in the EEEB major will be assigned to a specialized EEEB faculty adviser, similar to how BMS major advising is structured.

M. Retention Plan

- Describe the process for assessing and improving student persistence and completion *****HLC requirement*****

To maximize student retention in the EEEB major, we will take steps to help ensure students develop strong connections with EEEB faculty and advising staff. EEEB students will be strongly encouraged to meet at least once per year with both faculty and CAS advisers to receive guidance with selecting and scheduling courses, to ensure they stay on track for graduation. We will also work closely with Career and Life Services to ensure students receive the best possible advice about which courses, research opportunities, and internship opportunities are best suited to advance their individual career goals. To

facilitate this, we will invite staff from Career and Life Services to engage with students during the BIO 1301 (Intro to Biology Lab II) course. To increase student awareness of job prospects for an EEEB graduate, students will be encouraged to set up annual meetings with Career and Life Services and to develop a portfolio including a resume aimed at achieving employment in their chosen field.

Through the BIO 1301 course, students will be introduced to research methodologies during their first year in the program, and students who express interest in ecological or evolutionary biology research will be advised to reach out to faculty with related research interests.

As outlined in our Assessment Plan, we will collect survey data from outgoing students to provide indirect measures of our program's design. We will also reach out to students who fail to graduate from the OU-EEEB program to seek feedback about any changes that might have increased their chances of persisting through the program.

V. Off-Campus or Online Information

A. Location (e.g. main campus, OUWC, MUC, online, other) *****HLC requirement*****

Main campus

B. Explain how the quality, access, and cost considerations for “off-campus sites” or online program proposals will be assessed. *****HLC requirement*****

An “off-campus site” is a place where instruction is taking place and students can:

- Complete 50% or more of the courses leading to a degree program;
- Complete a full degree program (degree site); OR
- Complete 50% or more of the courses leading to a Title IV eligible certificate

N/A – program will be offered on campus

VI. Needs and Costs

A. New resources needed for the proposed program *****HLC requirement*****

- Number of new faculty to be hired
- Cost of faculty retraining or continuing education
- Source of new resources

Although most courses required by the proposed major are already offered and can be staffed by existing faculty, additional resources are needed to offer the two proposed new courses and additional sections of existing courses. We also anticipate administrative costs as the number of enrolled students grows over the first several years.

To support the need to offer additional sections of lecture and lab courses, we request one new Special Instructor line. The Special Instructor line will assist with teaching of core courses including the new lab course BIO 1301 (Introductory Biology Lab II); new sections of BIO 1300 (Introductory Biology II) and BIO 3330 (General Ecology); and assist with program assessment and advising of EEEB majors. The SI will begin the second year of the program, in time to support anticipated enrollment growth. We budgeted for a \$68K starting salary in F2026, based on an expected 2% annual increase from recent SI starting salaries in the Biological Sciences department (~\$65K in recent years).

We budgeted for new graduate teaching assistant lines to staff new lab sections in support of the EEEB major. Based on anticipated enrollment of 25-30 new students per year in the “most likely” scenario (see Pro Forma Budget), and a maximum of 16 students per lab section, we anticipate needing to add two additional sections per year for each of the following required lab courses: BIO 1201, BIO 1301 (new lab course), BIO 3330, and BIO

4974 (new Capstone course). We also anticipate needing to schedule two additional upper level lab sections per year to support the Quantitative Lab requirement, two new sections to support the Field Lab requirement, and four new sections of other upper level lab courses to support the "other lab courses" requirement. This is a total of 16 additional lab sections per year, including 8 upper level (3000+) lab courses. Graduate teaching assistants teach one lab section per semester (2 per year), so we are requesting eight new Graduate Teaching Assistantship lines to support the new EEEB program.

Of the eight requested TA lines, we are requesting two M.S. lines to support new sections of introductory biology lab courses (BIO 1201 & 1301), and six Ph.D. lines to support new sections of upper-level lab courses. Upper-level lab courses require more specialized laboratory, writing, and data analysis skills, and these needs can best be met by recruiting Ph.D. students to assist with these courses. EEEB research faculty have more than sufficient capacity in their research labs to accommodate these additional graduate students and mentor them through their graduate studies. We also do not anticipate any trouble recruiting this number of high-quality new graduate students into the program, given the large numbers of students we have had to turn away in recent years for lack of TA funding. The number of available TA lines is currently the primary limitation to the number of graduate students mentored by EEEB-affiliated research faculty in the Department of Biological Sciences.

Note that the Pro Forma Budget template is not configured to allow entry of a mix of MS + PhD lines, so the Pro Forma Budget is based on 8 PhD lines.

We will need to hire a Clerical Technical (CT) to oversee increased teaching lab needs. This includes new teaching labs and increased enrollment in existing labs in the department. The CT will be responsible for: 1) ensuring adequate supplies exist and 2) maintaining equipment needed to offer the labs. Current staff in Biology are using their full time to operate existing labs, so an additional CT is needed to support this new program as it grows. A key responsibility of this position will be to coordinate maintenance of key outdoor teaching facilities including LORACS and the Biological Preserve, which are important resources needed to support the EEEB program. We anticipate hiring the CT in the second year of the program, as anticipated program enrollment begins to grow and EEEB students start enrolling in their upper level lab courses. The CT position will be contingent on enrollment growth; thus we have omitted this position from the "worst case" enrollment scenario.

To support the new BIO 1301 lab course, we estimate \$11,000 initial cost to purchase lab and field equipment for this course including: 20 pairs of waders and 5 each (1 per group of 4 students) of dip nets, zooplankton tow nets, pH meters, dissolved oxygen meters, and laptop computers. We estimate \$2000 annual cost for BIO 1301 consumable supplies starting in year 1 of the program. Estimated annual expenses are based on 40% of our current annual expenses for the BIO 1201 labs. BIO 1301 should have lower enrollment than BIO 1201, which also serves Biology BA/BS and ENV majors.

To support the new BIO 4974 capstone course, which will include a laboratory component, we estimate \$3000 initial cost (starting in year 2 of the program) and \$1000 subsequent annual cost for consumable supplies (starting in year 3 of the program).

To support increased enrollment in our existing upper-level lab and field courses, we budgeted an additional \$3000 per year in materials & supplies costs starting in Year 3 of the program.

We budgeted \$2000 per year to replace worn or damaged equipment, starting in Year 2 of the program.

We do not anticipate additional costs associated with equipment maintenance contracts, faculty training, or continuing education.

Revenues to support these costs will come from additional tuition from increased enrollment and retention of students who would not otherwise have attended Oakland University. This may include students who would have otherwise sought an EEEB-related major at a different institution and local students who would have otherwise decided not to enroll in a 4-year degree program.

B. Existing resources to be reallocated (e.g., closing a program, ending an initiative, existing faculty and staff who can support the proposed program)

This program can be almost entirely supported by existing staff in the Biological Sciences, mostly by filling in classes whose enrollment has declined in recent years. Nearly all the courses required in this major are also taken by students in the Biology B.S., Biology B.A., Biomedical Sciences B.S., or Environmental Science B.S. majors, or various majors in the School of Health Sciences.

C. 5-Year budget and revenue from program - Appendix E *HLC requirement*****

See attached Pro Forma Budget.

D. Library needs – Include library assessment report - Appendix F *HLC requirement*****

Library needs for the EEEB will be comparable to that for other majors in the Biological Sciences; thus, few new resources are required. See Appendix F.

E. UCM Assessment plan for recruiting and marketing needs (contact your UCM liaison) *HLC requirement*****

See Appendix I

F. Classroom, laboratory, space, tech, renovation needs *HLC requirement*****

- What are the physical facilities and equipment needed to support the program
- Indicate the impact that the proposed change will have on the physical resources and laboratories that currently accommodate existing programs and services, or identify new laboratory and preceptor needs

No new classroom or lab space is needed to implement the new program. We can accommodate additional students and sections in existing lecture and lab classroom spaces. The new lab course (BIO 1301: Biology Lab II) will be offered in one of our existing lab classrooms that is currently under-utilized (DH 209/212). To serve this lab course, minor renovations (e.g., shelves) will be needed to expand storage space, and new equipment and supplies will be needed including computers, glassware, plastic bins, and consumables.

Improvements to the outdoor education resources such as the Biological Preserve and LORACS facility would significantly benefit research, education, and outreach efforts related to the new program. However, these infrastructure improvements are not essential to successfully initiate the EEEB program.

G. Equipment needs *HLC requirement*****

Equipment needs will be minor. The biggest expenses will be for field equipment, such as nets, waders, and digital meters to measure environmental variables (e.g., pH & dissolved oxygen). Most equipment needed for BIO 1301 will be shared with the existing BIO 1201 lab course, which will be scheduled in the same laboratory suite (DH 209/212).

VII. Appendices

- A. Abbreviated Faculty Vitae ***HLC requirement***
 - B. Degree Requirements ***HLC requirement***
 - C. Typical Student Plan of Study – Full-Time Schedule
 - D. Detailed New Course Descriptions or Syllabi ***HLC requirement***
 - E. Pro Forma Budget ***HLC requirement***
 - F. Library Budget Report ***HLC requirement***
 - G. University Assessment Plan ***HLC requirement***
 - H. Support Letters (e.g., Professional Societies, Governmental Agencies, Prospective Employers, Professionals in the Field)
 - I. University Communications and Marketing assessment report ***HLC requirement***
-

APPENDIX A

Faculty Qualifications

Include information relevant to the proposed program for each faculty member who will be involved

Faculty Member 1		
Faculty Name Thomas R Raffel, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	Expert ecologist with a Ph.D. in Biology and >50 publications in peer reviewed ecological journals. Specific professional expertise in parasite & disease ecology, amphibian biology, thermal biology, ecological modeling, and design & analysis of biological experiments,	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	More than 10 years of experience designing and teaching courses in Ecology (BIO 3330), Biology Lab (BIO 1201), Ecological Problem Solving (BIO 4380), Ecological Problem Solving Lab (BIO 4381), Medical Parasitology (BIO 4320), Medical Parasitology Lab (BIO 4321), and Design & Analysis of Biological Experiments (BIO 5388). Will assist in development of the proposed new introductory lab course (BIO 1301).	
Course Load New Program 2:2	Current Course Load 2:2	
If not yet hired, provide the ad and job description for the position N/A		
Faculty Member 2		
Faculty Name Scott Tiegs, Ph.D.	Title Professor	Department Biological Sciences
Academic Qualifications (100 words max)	PhD in Aquatic Ecology, author of >80 peer-review publications on topics including ecology of biological invasions, nutrient cycling, biomonitoring, and restoration ecology. Subject-matter editor for Ecological Society of America journal <i>Ecosphere</i> . Nominated for OU Teaching Excellence Award (2x), and recipient of Outstanding Thesis Committee Chair Award (2X).	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	14 years of experience in instruction in higher education. Has taught Intro to Biology (BIO 1300), Ecology (BIO 3300), Tropical Field Ecology (BIO 3333), and Ecology of Streams and Rivers (BIO 4333/5333). Thesis Committee Chair of 14 successful PhD/M.S.dissertations/theses.	
Course Load New Program 2:2	Current Course Load 2:2	
If not yet hired, provide the ad and job description for the position N/A		
Faculty Member 3		
Faculty Name Mary Jamieson, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	PhD in Ecology and Evolutionary Biology with expertise in plant and insect ecology. Principle investigator leading research on environmental change effects on biodiversity, funded by USDA, USFWS, NSF, Foundation for Food and Agriculture Research, among others. Published 20 peer-reviewed articles investigating effects of nitrogen deposition, climate and land-use change on ecological interactions between plants and insects. Trained and mentored 50 undergraduate and graduate student researchers – including six graduate and 11 undergraduates on independent research projects.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Ten years of teaching experience for the following courses: Conservation Biology, Community and Population Biology, Scientific Communications and Inquiry, Tropical Ecology, and Global Change Biology.	
Course Load New Program 2:2	Current Course Load 2:2	

If not yet hired, provide the ad and job description for the position N/A		
Faculty Member 4		
Faculty Name Taras Oleksyk, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	PhD in Toxicology, author of >60 peer-review publications on topics including genomics, ecology, and genetic epidemiology. Academic editor for the Journal of Heredity, and Board Member of GigaByte. Recipient of the OU Teaching Excellence Award, and OU Researcher of the Year	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	16 years of experience in instruction in higher education. Has taught Evolution (BIO 3340), and Advanced Evolution (BIO 4342) at OU. Co-Director and Executive Committee Member of the International Course "Recent advances in Conservation Genomics (ConGen Global). Thesis Committee Chair of 14 successful PhD/M.S. dissertations/theses.	
Course Load New Program 2:2	Current Course Load 2:2	
If not yet hired, provide the ad and job description for the position N/A		

Faculty Member 5		
Faculty Name Nicole Wagner, Ph.D.	Title Assistant Professor	Department Biological Sciences
Academic Qualifications (100 words max)	Ph.D. in Environmental and Life Science with expertise in freshwater ecology. Have published >35 peer reviewed articles that range in specialization from aquatic invertebrate physiology, aquatic autotroph physiology, biogeochemical cycling in lakes, physical limnology.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Two years-experience in developing courses, Lake Ecology (BIO 4332) and teaching introductory biology (BIO 1300). Help lead course based undergraduate research experience from 2019-2022 that has resulted in publications with undergraduate coauthors.	
Course Load New Program 1:1	Current Course Load 1:1	
If not yet hired, provide the ad and job description for the position N/A		

Faculty Member 6		
Faculty Name Fay Hansen, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	Ph.D. in Human Physiology, Certificates in Organic Farming, Permaculture, & Plant-Based Nutrition. 40+ years in academia including teaching and research, publications & grant funding in biomedical and ecological/agricultural studies. Founded minor in Urban Agriculture, sponsored undergraduate research projects in agroecology.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Founded Campus Student Organic Farm as active learning field site for STEM training, developed 15 cr. courses in Organic Farming (Bio 3360, BIO 3361 (3 seasonal versions), BIO 3362, BIO 3363, and BIO 4338, which I have taught for 12 years.	
Course Load New Program 2:2	Current Course Load 2:2	
If not yet hired, provide the ad and job description for the position N/A		

Faculty Member 7		
Faculty Name Mark Sturtevant, Ph.D.	Title Associate Professor of Practice	Department Biological Sciences

Academic Qualifications (100 words max)	Ph.D. in Entomology with over 10 peer reviewed publications plus extended teaching experience in a wide range of subjects within biology.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Over twenty years experience developing and teaching courses ranging from Introductory Biology, Anatomy and Physiology, Genetics, and Developmental Biology. I have also taught our Evolutionary Biology (BIO 3340) course at OU for 10 years.	
Course Load New Program 3:3	Current Course Load 3:3	
If not yet hired, provide the ad and job description for the position N/A		

APPENDIX B

Degree Requirements

CORE BIOLOGY COURSES					
Course	Title	Credits	Co/Prerequisites	New (x if yes)	% Distance
BIO 1200	Biology I	4	N/A	☐	0 % Distance
BIO 1201	Biology Laboratory I	1	BIO 1200	☐	0 % Distance
BIO 1300	Biology II	4	N/A	☐	0 % Distance
BIO 1301	Biology Laboratory II	1	BIO 1300	X	0 % Distance
BIO 3340	Evolutionary Biology	4	BIO 1200 and BIO 1300	☐	0 % Distance
BIO 3400	Genetics	4	BIO 1200 and BIO 1300	☐	0 % Distance
BIO 3330	General Ecology	5	BIO 1200 and BIO 1300	☐	0 % Distance
BIO 49XX	Ecology and Evolution Capstone	4	WRT 1060; Senior standing	X	0 % Distance

REQUIRED NON-BIOLOGY COURSES					
Course	Title	Credits	Co/Prerequisites	New (x if yes)	% Distance
CHM 1440	General Chemistry I	4	MTH 0662 or placement	☐	0 % Distance
CHM 1470	General Chemistry Laboratory I	1	CHM 1440	☐	0 % Distance
CHM 1450	General Chemistry II	4	CHM 1440	☐	0 % Distance
CHM 1480	General Chemistry Laboratory II	1	CHM 1450	☐	0 % Distance
PHY 1100	General Physics Lab I	1	PHY 1010 or PHY 1510	☐	0 % Distance

OTHER REQUIREMENTS (choose one from each category unless otherwise stated)	
Physics: PHY 1010 (4) or PHY 1510 (4)	
Math: MTH 1441 (4) or (MTH 1331 (4) + MTH 1332 (3))	
Statistics: STA 2220 (4) or STA 2222 (4) or STA 2226 (4)	
Environmental Chemistry: CHM 2340 (4) or ENV 3080 (4) or ENV 3090 (4) or ENV 3120 (4) or ENV 3540 (4) or ENV 3550 (4) or ENV 3700 (4)	
Physiology: BIO 2640 (4) OR BIO 2650 (4)	
Taxonomic diversity: BIO 3312 (4) or BIO 3320 (5) or BIO 3322 (4) or BIO 3333 (4) or BIO 3334 (3) or BIO 3360 (4) or BIO 3500 (4) or BIO 4320 (4)	
Computational Biology: BIO 4380 (4) or BIO 4412 (4)	
Quantitative Lab: BIO 4381 (1) or BIO 4413 (1)	
Field Lab from: BIO 3312 (4); BIO 3332 (4); BIO 3333 (3); BIO 3343 (2); BIO 3351 (1); BIO 3361 (1); BIO 3363 (1)	
Two additional labs from: BIO 4381 (1); BIO 4413 (1); BIO 3312 (4); BIO 3332 (4); BIO 3333 (3); BIO 3343 (2); BIO 3351 (1); BIO 3361 (1); BIO 3363 (1); BIO 3211 (1); BIO 3320 (5); BIO 3323 (1); BIO 3401 (1); BIO 3501 (1); BIO 3621 (1); BIO 4321 (1); BIO 4995 (1)	
Two additional 4000-level lecture courses from: BIO 4310 (4); BIO 4320 (4); BIO 4330 (4); BIO 4332 (4); BIO 4336 (4); BIO 4338 (4); BIO 4342 (4); BIO 4350 (4); BIO 4400 (4); BIO 4412 (4)	
Additional BIO or ENV elective courses , at the 2000 level or above, as needed to meet the 60-credit minimum (not including BIO 2006 or BIO 3000)	

APPENDIX C – Typical Student Plan of Study

EEEB Typical Plan of Study – Full-Time Schedule

Student Schedule		
Fall I BIO 1200 (4) BIO 1201 (1) CHM 1440 (4) CHM 1470 (1) WRT 1050 (4)	Winter I WRT 1060 (4) BIO 1300 (4) BIO 1301 (1) CHM 1450 (4) CHM 1480 (1)	Summer I
Fall II MTH 1441 (4) PHY 1100 (1) BIO 2640 (4) BIO 3330 (5)	Winter II PHY 1510 (4) ENG 1500 (4) BIO 3400 (4) BIO 3340 (4) BIO 3361 (1)	Summer II
Fall III AN 1511 (4) BIO 3322 (4) BIO 3323 (1) ENV 3090 (4) BIO 4332 (4)	Winter III COM 1500 (4) BIO 4380 (4) BIO 4381 (1) BIO 4338 (4) STA 2222 (4)	Summer III
Fall IV MUS 1000 (4) PHL 1300 (4) BIO 4310 (4) BIO 3350 (4) BIO 3351 (1)	Winter IV MUS 1010 (4) PHL 2100 (4) BIO 4995 (2) BIO 4974 (4)	Summer IV

APPENDIX D – Detailed Course Descriptions and Syllabi

New Course Descriptions:

BIO 1301 – Biology Laboratory 2 (1 credit)

Course Description: Introduction to fundamental scientific skills including hypothesis development, experimental design, data collection, analysis of biological data, and scientific writing. Laboratory and field activities emphasize ecological dynamics, evolutionary biology, animal behavior, plant and invertebrate anatomy, and biological diversity.

Pre- OR Co-requisite: BIO 1300

(Tentative syllabus provided below)

BIO 4974 – Ecology and Evolution Capstone (4 credits)

Course Description: A synthesis of concepts and skills needed for success in fields related to ecology, evolution, and environmental biology, including the intersection of life sciences with cultural, social, and ethical issues. Students will evaluate how science is communicated in primary literature, technical reports, and popular press. Students will demonstrate skills in teamwork and scientific inquiry through oral and written communication of results from individual and group research projects.

General Education Requirement(s): Satisfies the university general education requirement for a writing intensive course in the major. Satisfies the university general education requirement for the capstone experience.

Prerequisite: WRT 1060 or equivalent with a grade of (C) or higher

Level restriction: Senior standing

(Tentative syllabus provided below)

(Syllabi are on subsequent pages)

BIO 1301 Biology Laboratory II (1 credit)
CRN XXXXX; Semester YEAR
Classroom: 209 Dodge Hall

Course Description: Introduction to fundamental scientific skills including hypothesis development, experimental design, data collection, analysis of biological data, and scientific writing. Laboratory and field activities emphasize ecological dynamics, evolutionary biology, animal behavior, plant and invertebrate anatomy, and biological diversity.

Pre- OR Co-requisite: BIO 1300

Teaching Assistant: TBD

Office: 356 Dodge Hall; **Office Hours:** TBD

Email: XXXXX@oakland.edu (TAs: Please write BIO 1301 and indicate your lab Day/Section and room # in the subject line; see the chart below).

Instructor of Record: TBD		
CRN	Day/Time	Instructor Name
XXXXX	Mon 11:00 – 1:55 pm	TBD
XXXXX	Mon 2:00 – 4:55 pm	TBD

- Important note: The instructor of record is responsible for course content and coordinating all BIO 1301 labs, but **individual lab sections are taught mostly, or entirely, by teaching assistants (TAs)**. These instructors are your first point of contact should you have any issues or concerns. TAs have sole discretion in grading their individual sections.

Required Materials: The BIO 1301 Lab Manual (required) is to be purchased at the OU bookstore. Additional materials will be distributed through Moodle.

Course Learning Outcomes:

At an introductory level, students will learn to:

- Construct and test hypotheses using data from observational and experimental studies with suitable controls and experimental variables.
- Correctly and safely use lab and field equipment and scientific practices to study organismal and ecological systems.
- Carefully record accurate scientific observations and illustrate patterns in data using graphs, tables, and/or diagrams.
- Use appropriate statistical tools to analyze, interpret, and present relationships among variables using a computational environment (e.g., Excel).
- Search, analyze, and correctly cite peer-reviewed scientific literature from bibliographic databases (e.g., Web of Science).
- Write a concise and well-organized scientific report using appropriate format conventions.
- Give an effective oral scientific presentation.
- Use phylogenetic methods and multiple types of evidence to reconstruct evolutionary history and classify organisms into taxa.
- Evaluate hypotheses and explain key concepts related to ecology, evolution, animal behavior, plant and invertebrate anatomy, and biological diversity.

Course Policies and Grading

Attendance: *For all in-person labs, attendance and punctuality are essential to this course.* The purpose of a laboratory course is to provide experience; therefore, full student participation is necessary to earn credit for the course. Students arriving more than 30 minutes late will be marked as absent without an excuse. Traffic is not an acceptable excuse for lateness. **A student with two or more unexcused absences will receive a 0 for the course in accordance with the Biology Department policy.**

A student may be excused for an absence in the case of a serious illness if a doctor's note is provided, or documentation of some other bonafide emergency. If possible, a make-up lab is required (see below) for all excused absences. If an illness or emergency results in a missed lab that cannot be made up, it *may* be possible to obtain a waiver from the instructor for that lab if there are inescapable or extraordinary circumstances.

An excuse for a planned absence may be requested and given at the instructor's discretion. In such cases, the excused absence must be requested prior to the absence and the student must work out a plan with their TA to make up the missed work. As stated in the OU Excused Absence Policy, special considerations will be granted to student athletes, managers, or trainers in NCAA intercollegiate competitions, or participation as a representative of Oakland University at academic events and artistic performances approved by the Provost or designee.

<https://www.oakland.edu/provost/administrative-policies/>

Make Up Lab Policy: Due to limits in space, time constraints, scheduling, and other issues, in-person make up labs can pose logistical challenges that may be insurmountable. An in-person make up lab usually requires that a student attend a different section during the same week. Approval is granted only if there is space available in another section and both instructors agree to the arrangement. Due to the COVID-19 pandemic and spacing regulations for safety, make up labs may not be possible. Any missed lab can potentially have a negative impact on a student's course grade.

Academic Conduct: All written assignments and quizzes are to be done individually unless otherwise instructed. A student found to be cheating on any quiz, lab assignment, or written lab report (including plagiarism from fellow students or sources) will be given a grade of 0 for that item, and the evidence of cheating will be turned over to the university Academic Conduct Committee for further action. Please see the Undergraduate Catalog for details regarding academic misconduct. **Important:** Although you may often work together in lab, *all assignments are to be done individually unless otherwise directed.*

For more information, review OU's [Academic Conduct Regulations](#) and link to Academic Conduct Regulations: <https://www.oakland.edu/deanofstudents/policies/>

Adds/Drops: The university policy will be explicitly followed. It is the student's responsibility to know the deadlines for adding or dropping a course. For these, and other important dates, see <http://www.oakland.edu/important-dates>.

Grading: Individual lab section instructors (TAs) are the sole arbiter for grades. The instructor of record will not override any graded item. If you have a question about the grading of any assignment, ask your TA for clarification. Your grade for the course will be based on the weighted average of graded assessments as follows:

- 20% Quizzes** (5% each; lowest score dropped out of five quizzes; $4 \times 5\% = 20\%$)
- 40% Lab assignments** (worksheets & online homework assignments)
- 5% Writing assignment #1** (Introduction & References)
- 5% Writing assignment #2** (Methods & Results)
- 15% Full Lab Report** (Average of rough draft & revised report)
- 5% Group presentation** (based on a published study)
- 10% Participation** (Attendance & TA assessment of contributions to group activities)

- Quizzes: There will be five quizzes, either given at the beginning of most in-person class meetings OR taken online through Moodle. These quizzes will primarily assess what you learned in the previous week's lab and, in less detail, information from the manual and posted Moodle material about each lab activity.
- Lab Assignments: Lab assignments will vary in format. Some will be completed in class, as homework, or online. Detailed instructions for each will be provided. *All work is to be done individually; no collaboration is allowed unless you are directed otherwise.*
- Writing Assignments in Scientific Format: Upon completion of the first lab experiment, students will be given a series of assignments walking you through the process of writing a paper in scientific format (Writing assignment #1, Writing assignment #2, and Full Lab Report). This paper will be based on data collected from one of the in-class experiments. You will be given an opportunity to submit a revised version of your complete lab report, whose score will be averaged with that of your rough draft. Written assignments must be completed individually; no collaboration with other students or use of content produced by outside sources (including artificial intelligence) will be allowed. Outside sources of information and procedures must be appropriately cited. Detailed instructions, grading rubrics, and deadlines will be provided in class and via Moodle.
- Group Presentation: During the last week of class, you will give a collaborative scientific presentation, based on a published scientific paper, with a group of 2-4 students. Detailed instructions, grading rubric, and presentation schedule will be provided in class and via Moodle.
- Participation: Your participation score will be determined by your TA based on attendance and your contributions to in-class activities, discussions, and group assignments.

Late assignments will be penalized at the rate of 10% of the original value of the assignment for each day it is late, up to four consecutive days. Late assignments will not be accepted after four days. Assignments are considered late immediately following the lab period in which they are due.

Final Grade: Based on the percentage of points earned out of a possible 100%, a letter grade will be assigned using the following grade scale. The TA will record grades in the Moodle grade book. If you notice any errors in the recording of your grade in the Moodle grade book, please bring it to the attention of the TA as soon as possible.

A	95–100%		B+	85–89.9%		C+	70–74.9%		D+	55–59.9%
A-	90–94.9%		B	80–84.9%		C	65–69.9%		D	50–54.9%
			B-	75–79.9%		C-	60–64.9%		F	< 50%

Note: The instructor reserves the right to adjust the point scale should unforeseen circumstances require adjustment.

Online Materials: Students must visit the BIO 1301 site on Moodle within the first week of class. You will need to use the Moodle page to access required course materials and to complete/submit assignments. Students will find important supplemental information on Moodle and are responsible for checking Moodle regularly to access information to prepare for upcoming labs. Moodle can be accessed at: <https://moodle.oakland.edu/login/index.php>.

Academic Progress: At least once before the midterm, any student earning below a 2.0 will receive a notification from the instructor informing unsatisfactory academic progress. Satisfactory progress at mid-semester does not guarantee a passing grade at the end of the semester; you must continue to make satisfactory progress throughout the semester to earn a passing grade. You may ask the instructor about your academic progress at any time.

In-Person Laboratory Conduct:

- The use of cell phones and other personal electronic devices are prohibited unless permitted by the instructor for special circumstances. Otherwise, please silence your phone and put it away. Laptop computers will be provided for use when appropriate, or a student may use their own with instructor permission.
- A student without proper attire will not be allowed to remain in the lab and will be considered an unexcused absence. As a matter of basic safety, proper attire includes closed toe shoes (no sandals, flip flops). Lab coats are NOT required, and we will provide any safety apparel you may need (e.g. gloves or safety glasses).
- Students are expected to refrain from disruptive behavior (such as arriving late, side conversations during lecture), clean up their bench space and equipment after each lab, check with the instructor before exiting the lab, and follow instructions and safety protocols. Students who fail to abide by these requirements may be asked to leave the lab, resulting in an unexcused absence.
- For more information, see the [Student Code of Conduct](https://www.oakland.edu/deanofstudents/student-code-of-conduct/philosophy-and-purpose/) for details. (Link to Student Code of Conduct: <https://www.oakland.edu/deanofstudents/student-code-of-conduct/philosophy-and-purpose/>)
- **COVID-19 Safety Information:** It is expected that students will follow university guidelines and mandates regarding COVID-19 safety and prevention while in the laboratory. Students who fail to comply will be asked to leave the classroom. You can keep up to date with these guidelines on the OU Return-to-Campus web page <https://oakland.edu/ghc/covid-guidelines-and-other-infectious-diseases/>

Special Considerations: Students with disabilities who may require accommodations should make an appointment with campus Disability Student Services. Students should also bring their needs to the attention of the instructor as soon as possible.

Non-Discrimination Statement

Oakland University is an inclusive and diverse community that respects the rights, viewpoints and lifestyles of all of our community members. We strive to maintain a learning and working environment free from discrimination and harassment on any basis and to create an environment where students feel respected and included. Discrimination is differential treatment, or unfair treatment, towards an individual or group, because of one's identity. Harassment includes actions that create an offensive, demeaning, intimidating or hostile environment.

Students experiencing or witnessing discrimination from a fellow student can reach out to the professor for resolving the matter. If students prefer not to reach out to their professor or are experiencing discrimination not related to a class, reach out to your academic adviser or the Dean of Students.] If you are experiencing discrimination from a faculty or staff member, you can contact the Dean of Students Office directly at (248) 370-3352.

These offices are available to provide additional support:

- [Center for Multicultural Initiatives](#) (CMI)
- [Gender and Sexuality Center](#) (GSC)
- [Disability Support Services](#) (DSS)
- [Veteran Support Services](#) (VSS)
- [Oakland University Counseling Center](#) (OUCC)

Preferred Name and/or Pronoun: If you do not identify with the name that is listed with the registrar, please notify your TA so that we may amend our records. If you wish to go by a particular pronoun, please inform your TA as well.

Planned Laboratory Schedule (below): Where indicated, please note that certain lab exercises are scheduled as online activities, while most will be held in-person. Students will be expected to complete the online activities on their own during the week they are scheduled. Because of the uncertainty of the COVID-19 pandemic, students will need to remain flexible regarding method of course delivery. We will make all reasonable efforts to adhere to the following schedule and lab exercise plan, but be mindful that circumstances could necessitate certain modifications.

BIO 1301 Tentative Schedule:

Wk	Activities	Assignments	Due dates & Quizzes
1	Course Overview Lab Safety Orientation Sources of Information in Science	Sources of Information Assign.	
2	L1a. Springtail population dynamics (whole class expt) Posing questions and developing hypotheses	SimUText: Experimental Design	Lab safety training DUE
3	L2a. Arthropod Behavior Lab (add treatment options?) Design & implement habitat choice experiment	Writing Assignment 1 (Intro & References)	SimUText DUE Quiz 1
4	L2b. Arthropod Behavior data analysis Intro to Excel activity	Lab 2 worksheet	
5	L3a. Aquatic Biodiversity Lab Intro to stereomicroscopy and dichotomous keys	Writing Assignment 2 (Methods & Results)	Writing Assign. 1 DUE
6	L3b. Biodiversity data analysis - richness, evenness, diversity, dominance	Lab 3 worksheet	Quiz 2
7	L4. Plant Reproduction Lab • Intro to compound microscopy & ocular micrometers	Lab Report Rough Draft Lab 4 worksheet	Writing Assignment 2 DUE
8	L5. Invertebrate Anatomy Lab • Dissection of major phyla	Lab 5 worksheet	Quiz 3
9	L6. Phylogenetics Lab Anatomic vs molecular cladistics analysis	Lab 6 worksheet	
10	L7a. Leaf stomata lab (field study) Observational study – ecological gradients	Lab 7 worksheet	Quiz 4 Lab Report Rough Draft DUE (Draft 1)
11	THANKSGIVING BREAK (no class)		
12	L7b. Leaf stomata data analysis	Group Presentation Lab Report Revisions	
13	L1b. Springtail dynamics data analysis Careers in Ecology, Evolution, & Env't Science	Lab 1 worksheet	Quiz 5
14	Presentation Day! (present a classic ecology/evolution study as if it was conducted by your group)		Group Presentation DUE Lab Report Revisions DUE

BIO 4974 – Ecology and Evolution Capstone (4 credits)
CRN XXXXX; Semester YEAR
DAY & DAY 1:00-4:20 PM in ROOM #

INSTRUCTOR: TBD

Email: xxxxxxxx@oakland.edu; Phone: (248) 370-XXXX

Office Hours: TBD

COURSE DESCRIPTION: A synthesis of concepts and skills needed for success in fields related to ecology, evolution, and environmental biology, including the intersection of life sciences with cultural, social, and ethical issues. Students will evaluate how science is communicated in primary literature, technical reports, and popular press. Students will demonstrate skills in teamwork and scientific inquiry through oral and written communication of results from individual and group research projects.

General Education Requirement(s): Satisfies the university general education requirement for a writing intensive course in the major. Satisfies the university general education requirement for the capstone experience.

Prerequisite: WRT 1060 or equivalent with a grade of (C) or higher

Level restriction: Senior standing

RECOMMENDED READING:

- Schimel, J. 2012. *Writing science: how to write papers that get cited and proposals that get funded*. Oxford University Press.
- Assigned readings will be provided in class and via Moodle

COURSE LEARNING OUTCOMES:

- **Students will demonstrate and apply general knowledge from five areas of Biological Sciences: (1) Physiology; (2) Genetics, (3) Ecology, (4) Evolution, and (5) Systematics.**
- **Students will demonstrate key skills in each of the following categories:**
 - (1) **Scientific method** – use the scientific process to advance knowledge of the natural world
 - (2) **Quantitative reasoning** – use mathematical, computational, and graphical models to analyze data and evaluate predictions of scientific hypotheses
 - (3) **Interdisciplinary practices** – synthesize ideas from peer-review literature and analyze societal connections and ethical implications of ecology, evolution, and environmental biology
 - (4) **Communication & collaboration** – effectively communicate scientific ideas through writing & oral presentation and work together in collaborative teams
- **Students will exhibit dispositions associated with success in science-related careers, including: (1) scholarly behavior, (2) integrity, (3) professionalism, and (4) open-mindedness.**

GENERAL EDUCATION LEARNING OUTCOMES:

- **In a capstone course, students will demonstrate:**
 - (1) appropriate uses of a variety of methods of inquiry and a recognition of ethical considerations that arise
 - (2) the ability to integrate the knowledge learned in general education and its relevance to the student's life and career
- **In a writing intensive course, students will demonstrate:**
 - (1) competence in more than one writing format
 - (2) ability to apply critical inquiry through the writing process, including gathering, interpreting, evaluating, and revising information appropriate to the area of study

COURSE DESIGN:

Students will learn to interpret, evaluate, and synthesize information related to a broad array of topics in ecology, evolution, and environmental biology – from basic to applied sciences. Topics will include ecology, environmental and sustainability science, evolution and conservation biology. Students will also work in collaborative groups to conduct a research project including collection and interpretation of data to test biological hypotheses. Assignments will include readings from a variety of resources as well as written and oral communication assignments that aim to foster personal and professional development in the biological sciences.

GRADED ASSESSMENTS:

5%	Resume/CV assignment
5%	Annotated Bibliography assignment
10%	Individual Oral Presentation (10-12 min)
15%	White Paper assignment (2-3 pages)
10%	1 st Draft Report Sections (5% each: Introduction, Methods)
10%	1 st Draft Full Report (research paper)
20%	Final Report
10%	Group Oral Presentation
5%	Comprehensive Exit Exam (tests general knowledge of five Biology areas)
10%	Participation/Attendance

Grading Scale:

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Minimum %	95	90	85	80	75	70	65	60	55	50	< 50

ATTENDANCE:

- Attendance and punctuality are mandatory for all classes.
- **Up to two excused absences will be allowed for this course** if they adhere to the OU Excused Absence Policy for OU events, or as determined on a case by case basis. Students should notify the instructor prior to an absence and arrange to make up or turn in assignments. **Students must arrange to make up and/or turn assignments with the instructor.**

- **Unexcused absences will result in a loss of attendance points. Four unexcused absences will result in no credit for the course.**

SPECIAL CONSIDERATIONS FOR BIO 4974:

- This is a writing-intensive class with multiple in-class participation and take-home graded assignments. We will cover a variety of scientific issues, which are sometimes controversial. Please approach these issues with an open mind when reading, analyzing, and discussing material presented.
- Students with disabilities who may require special considerations should make an appointment with campus Disability Support Services. Instructor makes every effort to accommodate special needs. Students should also bring their needs to the attention of the instructor as soon as possible.
- Student Preferred Names and Pronouns: If you do not identify with the name listed with the Registrar's Office, please notify the instructor so that it may be appropriately amended in the class list. In addition, if you prefer to go by a different pronoun, please let the instructor know as well.

ACADEMIC UNIVERSITY POLICIES:

- **Accessibility and Accommodations:** It is the University's goal that learning experiences be as accessible as possible. Students with disabilities who have questions about course accessibility are encouraged to contact the instructor immediately. The Office of Disability and Support Services (DSS) is available to help. DSS is located in room 103A North Foundation Hall. For more information, call 248-370-3266 or visit <http://www.oakland.edu/dss>
- **Policy on Academic Misconduct:** The University's regulations that relate to academic misconduct will be fully enforced. Any student suspected of cheating and/or plagiarism will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of academic misconduct in this course may receive a course grade of F, in addition to any penalty assigned by the Academic Conduct Committee. Students found guilty of academic misconduct by the Academic Conduct Committee may face suspension or permanent dismissal. The full policy on academic misconduct can be found in the General Information section of the Undergraduate Catalog.
- **Excused Absence Policy:** The University excused absence policy applies to participation as an athlete, manager or student trainer in NCAA intercollegiate competitions, or participation as an OU representative at academic events and artistic performances approved by the Provost or designee. For the excused absence policy, see <https://www.oakland.edu/provost/administrative-policies/>
- **Bereavement Policy:** In the event of the death of certain members within families or among loved ones, the University grants necessary bereavement absences upon student request. For the official policy, see <https://www.oakland.edu/provost/administrative-policies/>
- **Student Preferred Name/Pronoun Policy:** The University recognizes many of its community members use names other than their legal names to identify themselves. As long as this different name is not used for misrepresentation—or a legal name required by University business, policy, or legal need—the University acknowledges that a "preferred name" will be used wherever possible. The University reserves the right not to accept a preferred name if it is deemed inappropriate, including a preferred name that is vulgar, offensive, or creates confusion with another person.

Tentative Schedule

Wk	Topics & Assignments	Assignments
1	Course introduction; Personal introductions & Group formation Jobs – apply your training in Ecology, Evolution, & Env't Biology Professional development – CV's and resumes	Resume/CV
2	Science in the news (individual presentation – topic selection) Sources of information - implicit & explicit biases in research & media Communicating science in different forms – know your audience Oral communication – presenting to peers and the public	Oral presentation (science news) White Paper
3	Intro to peer reviewed literature & search engines Data papers, technical reports, synthesis reviews, white papers Primary literature meta-analyses – evaluating data sources Intro to individual writing assignment (technical report)	Resume/CV DUE
4	Individual oral presentations – Current topics in EEEB	
5	Social, Political, Ethical implications of EEEB biology research Ethical standards for research & data integrity	White Paper DUE
6	Library day	Annotated Bibliography
7	Group research projects – introduction & brainstorm Developing hypotheses & predictions Experimental design considerations	
8	Recording and compiling data Group research project – planning experiments	Annotated Bibliography DUE Introduction draft Methods draft
9	WINTER BREAK	
10	Group research projects – data collection	
11	Group research projects – data collection	Introduction draft DUE
12	Compiling & analyzing data Graphical presentation of data	Methods draft DUE Full Report Draft (add Results & Discussion)
13	Running & interpreting statistical models Interpreting & reporting statistical results	
14	Peer assessment of written reports	Full Report Draft DUE
15	Work on group presentations	
16	Final Group Presentations Presentation assessments EEEEB exit survey	Final Report DUE Peer assessment survey
17	EEEEB Comprehensive Exit Exam (final exam week)	

APPENDIX E – Pro Forma Budget

See attached Excel file: “Appendix E – Pro Forma Budget”

APPENDIX F – Library Budget Report

See attached document: “Appendix F – Library Budget Report”

APPENDIX G – University Assessment Plan

See attached document: “Appendix G – University Assessment Plan”

APPENDIX H – Support Letters

See attached document: “Appendix H – Support Letters”

APPENDIX I

University Communications and Marketing Assessment Report

Organic Marketing Recommendations

Work with unit marketing coordinator/director and UCM to develop support materials/content.

- Create student and faculty stories, including original photoshoots in labs/classrooms. Stories to be used on website, marketing pieces and ad creative
- Write marketing copy to promote program to add to webpage
- Create list of keywords for search engine optimization and use in program information and ads
- Participate in appropriate academic visit days or admissions events
- Involve faculty in any available PR/media stories related to program

Paid Media Marketing Recommendations

The objective of the BS in Ecology Evolution and Environmental Biology media campaign is to generate awareness of the new program and degree opportunity. The chart below outlines the media tactics to reach the Adult 18-24 demographic in the primary and secondary counties.

MEDIA	TARGET	RATIONALE	FLIGHT	ESTIMATED IMPRESSIONS	ESTIMATED NET COST
Digital	A18-24 interested in Biology, Ecology or Evolution in primary/secondary counties	Target spends 20+ hours online per week	2/1 – 4/30/25	2M	\$13,875
Paid Search*	Primary/Secondary Counties	85% of the target audience use Google	January – June 2025	CPC	(Brand Budget)
Facebook/Instagram	A18-24 in primary/secondary counties Interests: Biology (science), Ecology (science) & Evolutionary Science	Target spends 5+ hours on social media per day 75% of the target audience use Facebook	January – June 2025 (two flights per month)	600,000	\$6,000
IG Stories and Reels	A18-24 in primary/secondary counties Interests: Biology (science), Ecology (science) & Evolutionary Science	65% of the target audience use Instagram	January – June 2025 (one flight per month)	300,000	\$3,000
Agency Fee					\$2,125.00
Total:					\$25,000.00

*Paid search – Paid search is an impactful tactic to promote the new program. A campaign/Ad Group would be developed to include those searching for data science programs. Costs are absorbed by the overall OU marketing budget

APPENDIX A

EEEB Faculty Qualifications

Include information relevant to the proposed program for each faculty member who will be involved

Faculty Member 1		
Faculty Name Thomas R Raffel, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	Expert ecologist with a Ph.D. in Biology and >50 publications in peer reviewed ecological journals. Specific professional expertise in parasite & disease ecology, amphibian biology, thermal biology, ecological modeling, and design & analysis of biological experiments,	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	More than 10 years of experience designing and teaching courses in Ecology (BIO 3330), Biology Lab (BIO 1201), Ecological Problem Solving (BIO 4380), Ecological Problem Solving Lab (BIO 4381), Medical Parasitology (BIO 4320), Medical Parasitology Lab (BIO 4321), and Design & Analysis of Biological Experiments (BIO 5388). Will assist in development of the proposed new introductory lab course (BIO 1301).	
Course Load New Program 2:2	Current Course Load 2:2	
If not yet hired, provide the ad and job description for the position N/A		
Faculty Member 2		
Faculty Name Scott Tiegs, Ph.D.	Title Professor	Department Biological Sciences
Academic Qualifications (100 words max)	PhD in Aquatic Ecology, author of >80 peer-review publications on topics including ecology of biological invasions, nutrient cycling, biomonitoring, and restoration ecology. Subject-matter editor for Ecological Society of America journal <i>Ecosphere</i> . Nominated for OU Teaching Excellence Award (2x), and recipient of Outstanding Thesis Committee Chair Award (2X).	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	14 years of experience in instruction in higher education. Has taught Intro to Biology (BIO 1300), Ecology (BIO 3300), Tropical Field Ecology (BIO 3333), and Ecology of Streams and Rivers (BIO 4333/5333). Thesis Committee Chair of 14 successful PhD/M.S.dissertations/theses.	
Course Load New Program 2:2	Current Course Load 2:2	
If not yet hired, provide the ad and job description for the position N/A		
Faculty Member 3		
Faculty Name Mary Jamieson, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	PhD in Ecology and Evolutionary Biology with expertise in plant and insect ecology. Principle investigator leading research on environmental change effects on biodiversity, funded by USDA, USFWS, NSF, Foundation for Food and Agriculture Research, among others. Published 20 peer-reviewed articles investigating effects of nitrogen deposition, climate and land-use change on ecological interactions between plants and insects. Trained and mentored 50 undergraduate and graduate student researchers – including six graduate and 11 undergraduates on independent research projects.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Ten years of teaching experience for the following courses: Conservation Biology, Community and Population Biology, Scientific Communications and Inquiry, Tropical Ecology, and Global Change Biology.	

Course Load New Program 2:2		Current Course Load 2:2
If not yet hired, provide the ad and job description for the position N/A		
Faculty Member 4		
Faculty Name Taras Oleksyk, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	PhD in Toxicology, author of >60 peer-review publications on topics including genomics, ecology, and genetic epidemiology. Academic editor for the Journal of Heredity, and Board Member of GigaByte. Recipient of the OU Teaching Excellence Award, and OU Researcher of the Year	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	16 years of experience in instruction in higher education. Has taught Evolution (BIO 3340), and Advanced Evolution (BIO 4342) at OU. Co-Director and Executive Committee Member of the International Course "Recent advances in Conservation Genomics (ConGen Global). Thesis Committee Chair of 14 successful PhD/M.S. dissertations/theses.	
Course Load New Program 2:2		Current Course Load 2:2
If not yet hired, provide the ad and job description for the position N/A		

Faculty Member 5		
Faculty Name Nicole Wagner, Ph.D.	Title Assistant Professor	Department Biological Sciences
Academic Qualifications (100 words max)	Ph.D. in Environmental and Life Science with expertise in freshwater ecology. Have published >35 peer reviewed articles that range in specialization from aquatic invertebrate physiology, aquatic autotroph physiology, biogeochemical cycling in lakes, physical limnology.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Two years-experience in developing courses, Lake Ecology (BIO 4332) and teaching introductory biology (BIO 1300). Help lead course based undergraduate research experience from 2019-2022 that has resulted in publications with undergraduate coauthors.	
Course Load New Program 1:1		Current Course Load 1:1
If not yet hired, provide the ad and job description for the position N/A		

Faculty Member 6		
Faculty Name Fay Hansen, Ph.D.	Title Associate Professor	Department Biological Sciences
Academic Qualifications (100 words max)	Ph.D. in Human Physiology, Certificates in Organic Farming, Permaculture, & Plant-Based Nutrition. 40+ years in academia including teaching and research, publications & grant funding in biomedical and ecological/agricultural studies. Founded minor in Urban Agriculture, sponsored undergraduate research projects in agroecology.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Founded Campus Student Organic Farm as active learning field site for STEM training, developed 15 cr. courses in Organic Farming (Bio 3360, BIO 3361 (3 seasonal versions), BIO 3362, BIO 3363, and BIO 4338, which I have taught for 12 years.	
Course Load New Program 2:2		Current Course Load 2:2
If not yet hired, provide the ad and job description for the position N/A		

Faculty Member 7		
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Faculty Name Mark Sturtevant, Ph.D.	Title Associate Professor of Practice	Department Biological Sciences
Academic Qualifications (100 words max)	Ph.D. in Entomology with over 10 peer reviewed publications plus extended teaching experience in a wide range of subjects within biology.	
Prior Instructional responsibilities and other experience relevant to the course they will teach in the program. (100 words max)	Over twenty years experience developing and teaching courses ranging from Introductory Biology, Anatomy and Physiology, Genetics, and Developmental Biology. I have also taught our Evolutionary Biology (BIO 3340) course at OU for 10 years.	
Course Load New Program 3:3	Current Course Load 3:3	
If not yet hired, provide the ad and job description for the position N/A		

APPENDIX B. Degree Requirements

CORE BIOLOGY COURSES

Course	Title	Credits	Co/Prerequisites	New (x if yes)	% Distance
BIO 1200	Biology I	4	N/A		0 % Distance
BIO 1201	Biology Laboratory I	1	BIO 1200		0 % Distance
BIO 1300	Biology II	4	N/A		0 % Distance
BIO 1301	Biology Laboratory II	1	BIO 1300	X	0 % Distance
BIO 3340	Evolutionary Biology	4	BIO 1200 and BIO 1300		0 % Distance
BIO 3400	Genetics	4	BIO 1200 and BIO 1300		0 % Distance
BIO 3330	General Ecology	5	BIO 1200 and BIO 1300		0 % Distance
BIO 49XX	Ecology and Evolution Capstone	4	WRT 1060; Senior standing	X	0 % Distance

REQUIRED NON-BIOLOGY COURSES

Course	Title	Credits	Co/Prerequisites	New (x if yes)	% Distance
CHM 1440	General Chemistry I	4	MTH 0662 or placement		0 % Distance
CHM 1470	General Chemistry Laboratory I	1	CHM 1440		0 % Distance
CHM 1450	General Chemistry II	4	CHM 1440		0 % Distance
CHM 1480	General Chemistry Laboratory II	1	CHM 1450		0 % Distance
PHY 1100	General Physics Lab I	1	PHY 1010 or PHY 1510		0 % Distance

OTHER REQUIREMENTS (choose one from each category unless otherwise stated)

Physics: PHY 1010 (4) or PHY 1510 (4)

Math: MTH 1441 (4) or (MTH 1331 (4) + MTH 1332 (3))

Statistics: STA 2220 (4) or STA 2222 (4) or STA 2226 (4)

Environmental Chemistry: CHM 2340 (4) or ENV 3080 (4) or ENV 3090 (4) or ENV 3120 (4) or ENV 3540 (4) or ENV 3550 (4) or ENV 3700 (4)

Physiology: BIO 2640 (4) OR BIO 2650 (4)

Taxonomic diversity: BIO 3312 (4) or BIO 3320 (5) or BIO 3322 (4) or BIO 3333 (4) or BIO 3334 (3) or BIO 3360 (4) or BIO 3500 (4) or BIO 4320 (4)

Computational Biology: BIO 4380 (4) or BIO 4412 (4)

Quantitative Lab: BIO 4381 (1) or BIO 4413 (1)

Field Lab from: BIO 3312 (4); BIO 3332 (4); BIO 3333 (3); BIO 3343 (2); BIO 3351 (1); BIO 3361 (1); BIO 3363 (1)

Two additional labs from: BIO 4381 (1); BIO 4413 (1); BIO 3312 (4); BIO 3332 (4); BIO 3333 (3); BIO 3343 (2); BIO 3351 (1); BIO 3361 (1); BIO 3363 (1); BIO 3211 (1); BIO 3320 (5); BIO 3323 (1); BIO 3401 (1); BIO 3501 (1); BIO 3621 (1); BIO 4321 (1); BIO 4995 (1)

Two additional 4000-level lecture courses from: BIO 4310 (4); BIO 4320 (4); BIO 4330 (4); BIO 4332 (4); BIO 4336 (4); BIO 4338 (4); BIO 4342 (4); BIO 4350 (4); BIO 4400 (4); BIO 4412 (4)

Additional BIO or ENV elective courses, at the 2000 level or above, as needed to meet the 60-credit minimum (not including BIO 2006 or BIO 3000)

APPENDIX C. Typical Plan of Study – Full-Time Schedule**B.S. in Ecology Evolution & Environmental Biology**

Student Schedule		
Fall I BIO 1200 (4) BIO 1201 (1) CHM 1440 (4) CHM 1470 (1) WRT 1050 (4)	Winter I WRT 1060 (4) BIO 1300 (4) BIO 1301 (1) CHM 1450 (4) CHM 1480 (1)	Summer I
Fall II PHY 1510 (4) PHY 1100 (1) BIO 2640 (4) BIO 3330 (5)	Winter II MTH 1441 (4) ENG 1500 (4) BIO 3400 (4) BIO 3340 (4) BIO 3361 (1)	Summer II
Fall III AN 1511 (4) BIO 3322 (4) BIO 3323 (1) ENV 3090 (4) BIO 4332 (4)	Winter III COM 1500 (4) BIO 4380 (4) BIO 4381 (1) BIO 4338 (4) STA 2222 (4)	Summer III
Fall IV MUS 1000 (4) PHL 1300 (4) BIO 4310 (4) BIO 3350 (4) BIO 3351 (1)	Winter IV MUS 1010 (4) PHL 2100 (4) BIO 4995 (2) BIO 4974 (4)	Summer IV

APPENDIX D - New Course Descriptions and Syllabi

BIO 1301 – Biology Laboratory 2 (1 credit)

Course Description: Introduction to fundamental scientific skills including hypothesis development, experimental design, data collection, analysis of biological data, and scientific writing. Laboratory and field activities emphasize ecological dynamics, evolutionary biology, animal behavior, plant and invertebrate anatomy, and biological diversity.

Pre- OR Co-requisite: BIO 1300

(Tentative syllabus provided below)

BIO 4974 – Ecology and Evolution Capstone (4 credits)

Course Description: A synthesis of concepts and skills needed for success in fields related to ecology, evolution, and environmental biology, including the intersection of life sciences with cultural, social, and ethical issues. Students will evaluate how science is communicated in primary literature, technical reports, and popular press. Students will demonstrate skills in teamwork and scientific inquiry through oral and written communication of results from individual and group research projects.

General Education Requirement(s): Satisfies the university general education requirement for a writing intensive course in the major. Satisfies the university general education requirement for the capstone experience.

Prerequisite: WRT 1060 or equivalent with a grade of (C) or higher

Level restriction: Senior standing

(Tentative syllabus provided below)

BIO 1301 Biology Laboratory II (1 credit)
CRN XXXXX; Semester YEAR
Classroom: 209 Dodge Hall

Course Description: Introduction to fundamental scientific skills including hypothesis development, experimental design, data collection, analysis of biological data, and scientific writing. Laboratory and field activities emphasize ecological dynamics, evolutionary biology, animal behavior, plant and invertebrate anatomy, and biological diversity.

Pre- OR Co-requisite: BIO 1300

Teaching Assistant: TBD

Office: 356 Dodge Hall; **Office Hours:** TBD

Email: XXXXX@oakland.edu (TAs: Please write BIO 1301 and indicate your lab Day/Section and room # in the subject line; see the chart below).

Instructor of Record: TBD		
CRN	Day/Time	Instructor Name
XXXXX	Mon 11:00 – 1:55 pm	TBD
XXXXX	Mon 2:00 – 4:55 pm	TBD

- Important note: The instructor of record is responsible for course content and coordinating all BIO 1301 labs, but **individual lab sections are taught mostly, or entirely, by teaching assistants (TAs)**. These instructors are your first point of contact should you have any issues or concerns. TAs have sole discretion in grading their individual sections.

Required Materials: The BIO 1301 Lab Manual (required) is to be purchased at the OU bookstore. Additional materials will be distributed through Moodle.

Course Learning Outcomes:

At an introductory level, students will learn to:

- Construct and test hypotheses using data from observational and experimental studies with suitable controls and experimental variables.
- Correctly and safely use lab and field equipment and scientific practices to study organismal and ecological systems.
- Carefully record accurate scientific observations and illustrate patterns in data using graphs, tables, and/or diagrams.
- Use appropriate statistical tools to analyze, interpret, and present relationships among variables using a computational environment (e.g., Excel).
- Search, analyze, and correctly cite peer-reviewed scientific literature from bibliographic databases (e.g., Web of Science).
- Write a concise and well-organized scientific report using appropriate format conventions.
- Give an effective oral scientific presentation.
- Use phylogenetic methods and multiple types of evidence to reconstruct evolutionary history and classify organisms into taxa.
- Evaluate hypotheses and explain key concepts related to ecology, evolution, animal behavior, plant and invertebrate anatomy, and biological diversity.

Course Policies and Grading

Attendance: *For all in-person labs, attendance and punctuality are essential to this course.* The purpose of a laboratory course is to provide experience; therefore, full student participation is necessary to earn credit for the course. Students arriving more than 30 minutes late will be marked as absent without an excuse. Traffic is not an acceptable excuse for lateness. **A student with two or more unexcused absences will receive a 0 for the course in accordance with the Biology Department policy.**

A student may be excused for an absence in the case of a serious illness if a doctor's note is provided, or documentation of some other bonafide emergency. If possible, a make-up lab is required (see below) for all excused absences. If an illness or emergency results in a missed lab that cannot be made up, it *may* be possible to obtain a waiver from the instructor for that lab if there are inescapable or extraordinary circumstances.

An excuse for a planned absence may be requested and given at the instructor's discretion. In such cases, the excused absence must be requested prior to the absence and the student must work out a plan with their TA to make up the missed work. As stated in the OU Excused Absence Policy, special considerations will be granted to student athletes, managers, or trainers in NCAA intercollegiate competitions, or participation as a representative of Oakland University at academic events and artistic performances approved by the Provost or designee.

<https://www.oakland.edu/provost/policies-and-procedures/>

Make Up Lab Policy: Due to limits in space, time constraints, scheduling, and other issues, in-person make up labs can pose logistical challenges that may be insurmountable. An in-person make up lab usually requires that a student attend a different section during the same week. Approval is granted only if there is space available in another section and both instructors agree to the arrangement. Due to the COVID-19 pandemic and spacing regulations for safety, make up labs may not be possible. Any missed lab can potentially have a negative impact on a student's course grade.

Academic Conduct: All written assignments and quizzes are to be done individually unless otherwise instructed. A student found to be cheating on any quiz, lab assignment, or written lab report (including plagiarism from fellow students or sources) will be given a grade of 0 for that item, and the evidence of cheating will be turned over to the university Academic Conduct Committee for further action. Please see the Undergraduate Catalog for details regarding academic misconduct. **Important:** Although you may often work together in lab, *all assignments are to be done individually unless otherwise directed.*

For more information, review OU's [Academic Conduct Regulations](#) and link to Academic Conduct Regulations: <https://www.oakland.edu/deanofstudents/policies/>

Adds/Drops: The university policy will be explicitly followed. It is the student's responsibility to know the deadlines for adding or dropping a course. For these, and other important dates, see <http://www.oakland.edu/important-dates>.

Grading: Individual lab section instructors (TAs) are the sole arbiter for grades. The instructor of record will not override any graded item. If you have a question about the grading of any assignment, ask your TA for clarification. Your grade for the course will be based on the weighted average of graded assessments as follows:

- 20% Quizzes** (5% each; lowest score dropped out of five quizzes; $4 \times 5\% = 20\%$)
- 40% Lab assignments** (worksheets & online homework assignments)
- 5% Writing assignment #1** (Introduction & References)
- 5% Writing assignment #2** (Methods & Results)
- 15% Full Lab Report** (Average of rough draft & revised report)
- 5% Group presentation** (based on a published study)
- 10% Participation** (Attendance & TA assessment of contributions to group activities)

- Quizzes: There will be five quizzes, either given at the beginning of most in-person class meetings OR taken online through Moodle. These quizzes will primarily assess what you learned in the previous week's lab and, in less detail, information from the manual and posted Moodle material about each lab activity.
- Lab Assignments: Lab assignments will vary in format. Some will be completed in class, as homework, or online. Detailed instructions for each will be provided. *All work is to be done individually; no collaboration is allowed unless you are directed otherwise.*
- Writing Assignments in Scientific Format: Upon completion of the first lab experiment, students will be given a series of assignments walking you through the process of writing a paper in scientific format (Writing assignment #1, Writing assignment #2, and Full Lab Report). This paper will be based on data collected from one of the in-class experiments. You will be given an opportunity to submit a revised version of your complete lab report, whose score will be averaged with that of your rough draft. Written assignments must be completed individually; no collaboration with other students or use of content produced by outside sources (including artificial intelligence) will be allowed. Outside sources of information and procedures must be appropriately cited. Detailed instructions, grading rubrics, and deadlines will be provided in class and via Moodle.
- Group Presentation: During the last week of class, you will give a collaborative scientific presentation, based on a published scientific paper, with a group of 2-4 students. Detailed instructions, grading rubric, and presentation schedule will be provided in class and via Moodle.
- Participation: Your participation score will be determined by your TA based on attendance and your contributions to in-class activities, discussions, and group assignments.

Late assignments will be penalized at the rate of 10% of the original value of the assignment for each day it is late, up to four consecutive days. Late assignments will not be accepted after four days. Assignments are considered late immediately following the lab period in which they are due.

Final Grade: Based on the percentage of points earned out of a possible 100%, a letter grade will be assigned using the following grade scale. The TA will record grades in the Moodle grade book. If you notice any errors in the recording of your grade in the Moodle grade book, please bring it to the attention of the TA as soon as possible.

A	95–100%		B+	85–89.9%		C+	70–74.9%		D+	55–59.9%
A-	90–94.9%		B	80–84.9%		C	65–69.9%		D	50–54.9%
			B-	75–79.9%		C-	60–64.9%		F	< 50%

Note: The instructor reserves the right to adjust the point scale should unforeseen circumstances require adjustment.

Online Materials: Students must visit the BIO 1301 site on Moodle within the first week of class. You will need to use the Moodle page to access required course materials and to complete/submit assignments. Students will find important supplemental information on Moodle and are responsible for checking Moodle regularly to access information to prepare for upcoming labs. Moodle can be accessed at: <https://moodle.oakland.edu/login/index.php>.

Academic Progress: At least once before the midterm, any student earning below a 2.0 will receive a notification from the instructor informing him/her of unsatisfactory academic progress. Satisfactory progress at mid-semester does not guarantee a passing grade at the end of the semester; you must continue to make satisfactory progress throughout the semester to earn a passing grade. You may ask the instructor about your academic progress at any time.

In-Person Laboratory Conduct:

- The use of cell phones and other personal electronic devices are prohibited unless permitted by the instructor for special circumstances. Otherwise, please silence your phone and put it away. Laptop computers will be provided for use when appropriate, or a student may use their own with instructor permission.
- A student without proper attire will not be allowed to remain in the lab and will be considered an unexcused absence. As a matter of basic safety, proper attire includes closed toe shoes (no sandals, flip flops). Lab coats are NOT required, and we will provide any safety apparel you may need (e.g. gloves or safety glasses).
- Students are expected to refrain from disruptive behavior (such as arriving late, side conversations during lecture), clean up their bench space and equipment after each lab, check with the instructor before exiting the lab, and follow instructions and safety protocols. Students who fail to abide by these requirements may be asked to leave the lab, resulting in an unexcused absence.
- For more information, see the [Student Code of Conduct](https://www.oakland.edu/deanofstudents/student-code-of-conduct/philosophy-and-purpose/) for details. (Link to Student Code of Conduct: <https://www.oakland.edu/deanofstudents/student-code-of-conduct/philosophy-and-purpose/>)
- **COVID-19 Safety Information:** It is expected that students will follow university guidelines and mandates regarding COVID-19 safety and prevention while in the laboratory. Students who fail to comply will be asked to leave the classroom. You can keep up to date with these guidelines on the OU Return-to-Campus web page <https://www.oakland.edu/return-to-campus/>

Special Considerations: Students with disabilities who may require accommodations should make an appointment with campus Disability Student Services. Students should also bring their needs to the attention of the instructor as soon as possible.

Non-Discrimination Statement

Oakland University is an inclusive and diverse community that respects the rights, viewpoints and lifestyles of all of our community members. We strive to maintain a learning and working environment free from discrimination and harassment on any basis and to create an environment where students feel respected and included. Discrimination is differential treatment, or unfair treatment, towards an individual or group, because of one's identity. Harassment includes actions that create an offensive, demeaning, intimidating or hostile environment.

Students experiencing or witnessing discrimination from a fellow student can reach out to the professor for resolving the matter. If students prefer not to reach out to their professor or are experiencing discrimination not related to a class, reach out to your academic adviser or the Dean of Students.] If you are experiencing discrimination from a faculty or staff member, you can contact the Dean of Students Office directly at (248) 370-3352.

These offices are available to provide additional support:

- [Center for Multicultural Initiatives](#) (CMI)
- [Gender and Sexuality Center](#) (GSC)
- [Disability Support Services](#) (DSS)
- [Veteran Support Services](#) (VSS)
- [Oakland University Counseling Center](#) (OUCC)

Preferred Name and/or Pronoun: If you do not identify with the name that is listed with the registrar, please notify your TA so that we may amend our records. If you wish to go by a particular pronoun, please inform your TA as well.

Planned Laboratory Schedule (below): Where indicated, please note that certain lab exercises are scheduled as online activities, while most will be held in-person. Students will be expected to complete the online activities on their own during the week they are scheduled. Because of the uncertainty of the COVID-19 pandemic, students will need to remain flexible regarding method of course delivery. We will make all reasonable efforts to adhere to the following schedule and lab exercise plan, but be mindful that circumstances could necessitate certain modifications.

BIO 1301 Tentative Schedule:

Wk	Activities	Assignments	Due dates & Quizzes
1	Course Overview Lab Safety Orientation Sources of Information in Science	Sources of Information Assign.	
2	L1a. Springtail population dynamics (whole class expt) Posing questions and developing hypotheses	SimUText: Experimental Design	Lab safety training DUE
3	L2a. Arthropod Behavior Lab (add treatment options?) Design & implement habitat choice experiment	Writing Assignment 1 (Intro & References)	SimUText DUE Quiz 1
4	L2b. Arthropod Behavior data analysis Intro to Excel activity	Lab 2 worksheet	
5	L3a. Aquatic Biodiversity Lab Intro to stereomicroscopy and dichotomous keys	Writing Assignment 2 (Methods & Results)	Writing Assign. 1 DUE
6	L3b. Biodiversity data analysis - richness, evenness, diversity, dominance	Lab 3 worksheet	Quiz 2
7	L4. Plant Reproduction Lab • Intro to compound microscopy & ocular micrometers	Lab Report Rough Draft Lab 4 worksheet	Writing Assignment 2 DUE
8	L5. Invertebrate Anatomy Lab • Dissection of major phyla	Lab 5 worksheet	Quiz 3
9	L6. Phylogenetics Lab Anatomic vs molecular cladistics analysis	Lab 6 worksheet	
10	L7a. Leaf stomata lab (field study) Observational study – ecological gradients	Lab 7 worksheet	Quiz 4 Lab Report Rough Draft DUE (Draft 1)
11	THANKSGIVING BREAK (no class)		
12	L7b. Leaf stomata data analysis	Group Presentation Lab Report Revisions	
13	L1b. Springtail dynamics data analysis Careers in Ecology, Evolution, & Env't Science	Lab 1 worksheet	Quiz 5

14	Presentation Day! (present a classic ecology/evolution study as if it was conducted by your group)		Group Presentation DUE Lab Report Revisions DUE
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BIO 4974 – Ecology and Evolution Capstone (4 credits)
CRN XXXXX; Semester YEAR
DAY & DAY 1:00-4:20 PM in ROOM #

INSTRUCTOR: TBD

Email: xxxxxxxx@oakland.edu; Phone: (248) 370-XXXX

Office Hours: TBD

COURSE DESCRIPTION: A synthesis of concepts and skills needed for success in fields related to ecology, evolution, and environmental biology, including the intersection of life sciences with cultural, social, and ethical issues. Students will evaluate how science is communicated in primary literature, technical reports, and popular press. Students will demonstrate skills in teamwork and scientific inquiry through oral and written communication of results from individual and group research projects.

General Education Requirement(s): Satisfies the university general education requirement for a writing intensive course in the major. Satisfies the university general education requirement for the capstone experience.

Prerequisite: WRT 1060 or equivalent with a grade of (C) or higher

Level restriction: Senior standing

RECOMMENDED READING:

- Schimel, J. 2012. *Writing science: how to write papers that get cited and proposals that get funded*. Oxford University Press.
- Assigned readings will be provided in class and via Moodle

COURSE LEARNING OUTCOMES:

- **Students will demonstrate and apply general knowledge from five areas of Biological Sciences: (1) Physiology; (2) Genetics, (3) Ecology, (4) Evolution, and (5) Systematics.**
- **Students will demonstrate key skills in each of the following categories:**
 - (1) **Scientific method** – use the scientific process to advance knowledge of the natural world
 - (2) **Quantitative reasoning** – use mathematical, computational, and graphical models to analyze data and evaluate predictions of scientific hypotheses
 - (3) **Interdisciplinary practices** – synthesize ideas from peer-review literature and analyze societal connections and ethical implications of ecology, evolution, and environmental biology
 - (4) **Communication & collaboration** – effectively communicate scientific ideas through writing & oral presentation and work together in collaborative teams
- **Students will exhibit dispositions associated with success in science-related careers, including: (1) scholarly behavior, (2) integrity, (3) professionalism, and (4) open-mindedness.**

GENERAL EDUCATION LEARNING OUTCOMES:

- **In a capstone course, students will demonstrate:**
 - (1) appropriate uses of a variety of methods of inquiry and a recognition of ethical considerations that arise
 - (2) the ability to integrate the knowledge learned in general education and its relevance to the student's life and career
- **In a writing intensive course, students will demonstrate:**
 - (1) competence in more than one writing format
 - (2) ability to apply critical inquiry through the writing process, including gathering, interpreting, evaluating, and revising information appropriate to the area of study

COURSE DESIGN:

Students will learn to interpret, evaluate, and synthesize information related to a broad array of topics in ecology, evolution, and environmental biology – from basic to applied sciences. Topics will include ecology, environmental and sustainability science, evolution and conservation biology. Students will also work in collaborative groups to conduct a research project including collection and interpretation of data to test biological hypotheses. Assignments will include readings from a variety of resources as well as written and oral communication assignments that aim to foster personal and professional development in the biological sciences.

GRADED ASSESSMENTS:

5%	Resume/CV assignment: 5%
5%	Annotated Bibliography assignment
10%	Individual Oral Presentation (10-12 min)
15%	White paper assignment (2-3 pages)
10%	1 st Draft Report Sections (5% each: Introduction, Methods)
10%	1 st Draft Full Report (research paper)
20%	Final Report
10%	Group Oral Presentation
5%	Comprehensive Exit Exam (tests general knowledge of five Biology areas)
10%	Participation/Attendance

Grading Scale:

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Minimum %	95	90	85	80	75	70	65	60	55	50	< 50
Grade point value	4.0	3.7	3.3	3.0	2.7	2.3	2.0	1.7	1.3	1.0	0.0

ATTENDANCE:

- Attendance and punctuality are mandatory for all classes.
- **Up to two excused absences will be allowed for this course** if they adhere to the OU Excused Absence Policy for OU events, or as determined on a case by case basis. Students should notify the instructor prior to an absence and arrange to make up or turn in

assignments. **Students must arrange to make up and/or turn assignments with the instructor.**

- **Unexcused absences will result in a loss of attendance points. Four unexcused absences will result in no credit for the course.**

SPECIAL CONSIDERATIONS FOR BIO 4974:

- This is a writing-intensive class with multiple in-class participation and take-home graded assignments. We will cover a variety of scientific issues, which are sometimes controversial. Please approach these issues with an open mind when reading, analyzing, and discussing material presented.
- Students with disabilities who may require special considerations should make an appointment with campus Disability Support Services. Instructor makes every effort to accommodate special needs. Students should also bring their needs to the attention of the instructor as soon as possible.
- Student Preferred Names and Pronouns: If you do not identify with the name listed with the Registrar's Office, please notify the instructor so that it may be appropriately amended in the class list. In addition, if you prefer to go by a different pronoun, please let the instructor know as well.

ACADEMIC UNIVERSITY POLICIES:

- **Accessibility and Accommodations:** It is the University's goal that learning experiences be as accessible as possible. Students with disabilities who have questions about course accessibility are encouraged to contact the instructor immediately. The Office of Disability and Support Services (DSS) is available to help. DSS is located in room 103A North Foundation Hall. For more information, call 248-370-3266 or visit <http://www.oakland.edu/dss>
- **Policy on Academic Misconduct:** The University's regulations that relate to academic misconduct will be fully enforced. Any student suspected of cheating and/or plagiarism will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of academic misconduct in this course may receive a course grade of F, in addition to any penalty assigned by the Academic Conduct Committee. Students found guilty of academic misconduct by the Academic Conduct Committee may face suspension or permanent dismissal. The full policy on academic misconduct can be found in the General Information section of the Undergraduate Catalog.
- **Excused Absence Policy:** The University excused absence policy applies to participation as an athlete, manager or student trainer in NCAA intercollegiate competitions, or participation as an OU representative at academic events and artistic performances approved by the Provost or designee. For the excused absence policy, see <https://www.oakland.edu/provost/policies-and-procedures/>
- **Bereavement Policy:** In the event of the death of certain members within families or among loved ones, the University grants necessary bereavement absences upon student request. For the official policy, see <https://www.oakland.edu/provost/policies-and-procedures/>
- **Student Preferred Name/Pronoun Policy:** The University recognizes many of its community members use names other than their legal names to identify themselves. As long as this different name is not used for misrepresentation—or a legal name required by University business, policy, or legal need—the University acknowledges that a "preferred name" will be used wherever possible. The University reserves the right not to accept a

preferred name if it is deemed inappropriate, including a preferred name that is vulgar, offensive, fanciful, or creates confusion with another person.

Tentative Schedule

Wk	Topics & Assignments	Assignments
1	Course introduction; Personal introductions & Group formation Jobs – apply your training in Ecology, Evolution, & Env't Biology Professional development – CV's and resumes	Resume/CV
2	Science in the news (individual presentation – topic selection) Sources of information - implicit & explicit biases in research & media Communicating science in different forms – know your audience Oral communication – presenting to peers and the public	Oral presentation (science news) White paper
3	Intro to peer reviewed literature & search engines Data papers, technical reports, synthesis reviews, white papers Primary literature metanalyses – evaluating data sources Intro to individual writing assignment (technical report)	Resume/CV DUE
4	Individual oral presentations – Current topics in EEEB	
5	Social, Political, Ethical implications of EEEB biology research Ethical standards for research & data integrity	White Paper DUE
6	Library day	Annotated bibliography
7	Group research projects – introduction & brainstorm Developing hypotheses & predictions Experimental design considerations	
8	Recording and compiling data Group research project – planning experiments	Annotated bibliography DUE Introduction draft Methods draft
9	WINTER BREAK	
10	Group research projects – data collection	
11	Group research projects – data collection	Introduction draft DUE
12	Compiling & analyzing data Graphical presentation of data	Methods draft DUE Full Report Draft (add Results & Discussion)
13	Running & interpreting statistical models Interpretating & reporting statistical results	
14	Peer assessment of written reports	Full Report Draft DUE
15	Work on group presentations	
16	Final Group Presentations Presentation assessments EEEB exit survey	Final Report DUE Peer assessment survey
17	EEEB Comprehensive Exit Exam (final exam week)	

SBRC Proforma Template

Ecology Evolution & Environmental Biology

FY2025

Most Likely Scenario

	Year 1	Year 2	Year 3	Year 4	Year 5
Est. New Students to Program	15	20	25	27	27
1st Year Cohort Revenue	\$ 253,800	\$ 338,400	\$ 423,000	\$ 456,840	\$ 456,840
2nd Year Cohort Revenue	\$ -	\$ 253,800	\$ 338,400	\$ 423,000	\$ 456,840
3rd Year Cohort Revenue	\$ -	\$ -	\$ 277,088	\$ 369,450	\$ 461,813
4th Year Cohort Revenue	\$ -	\$ -	\$ -	\$ 277,088	\$ 369,450
Gross Tuition Revenue	\$ 253,800	\$ 592,200	\$ 1,038,488	\$ 1,526,378	\$ 1,744,943
Less: Avg Financial Aid (30%)	\$ (76,140)	\$ (177,660)	\$ (311,546)	\$ (457,913)	\$ (523,483)
Net Tuition Revenue	\$ 177,660	\$ 414,540	\$ 726,941	\$ 1,068,464	\$ 1,221,460
Expenses					
Salaries					
Faculty Salaries	6101	\$ 68,000	\$ 69,700	\$ 69,700	\$ 69,700
Visiting Faculty	6101				
Administrative Professionals	6201				
Clerical Technical	6211	\$ 46,816	\$ 47,753	\$ 48,709	\$ 49,684
Administrative IC	6221				
Faculty Inload/Replacement Costs	6301				
Faculty Overload	6301				
Part-Time Faculty	6301				
Graduate Assistant	6311	\$ 28,495	\$ 56,990	\$ 92,610	\$ 128,230
Casual/Temp	6401				
Out of Classification	6401				
Student Labor	6501				
Total Salary Expense		\$ 28,495	\$ 171,806	\$ 210,063	\$ 246,639
Fringe Benefits	6701	\$ -	\$ 52,465	\$ 53,660	\$ 54,137
Total Compensation		\$ 28,495	\$ 224,271	\$ 263,723	\$ 300,776
Operating Expenses					
Supplies and Services	7101	\$ 2,000	\$ 5,000	\$ 6,000	\$ 6,000
Graduate Tuition	7101	29,280	58,560	87,840	117,120
E-Learning Support	7102				
Travel	7201				
Equipment	7501	\$ 11,000	\$ 2,000	\$ 2,000	\$ 2,000
Maintenance	7110				
Recruitment and advertising	7101	\$ 25,000	\$ 10,000	\$ 20,000	\$ 5,000
Library	7401	\$ 5,918	\$ 6,510	\$ 12,491	\$ 13,740
Faculty Startup Funding					
Total Operating Expenses		\$ 73,198	\$ 82,070	\$ 128,331	\$ 158,860
Total Expenses		\$ 101,693	\$ 306,341	\$ 392,054	\$ 459,636
University Overhead		\$ 45,000	\$ 105,000	\$ 180,000	\$ 261,000
Net Income (Loss)		\$ 30,967	\$ 3,199	\$ 154,887	\$ 347,828

¹The tuition calculations do not account for any attrition of students.



MEMORANDUM

To: Thomas Raffel, Associate Professor, Department of Biological Sciences

From: Nancy Bulgarelli, Library Liaison to the Department of Biological Sciences, University Libraries
Helen Levenson, Collection Development Librarian, University Libraries

Re: Library Collection Evaluation for Proposed B.S. in Ecology, Evolution & Environmental Biology

Date: March 24, 2024 | Revised January 23, 2025

In order to complete this library collection evaluation for the proposed B.S. in Ecology Evolution & Environmental Biology, we reviewed the University Libraries' current resources relevant to the coursework outlined in the draft program proposal and compared current holdings to ranked journals in the *Journal Citation Reports* database which reports on journal impact factors. We also reviewed library resources at universities offering comparable programs. The following is an assessment of the University Libraries' ability to support the proposed new degree program.

Ecology, Evolution, and Environmental Biology Databases

The Libraries currently subscribe to a number of biological sciences and multi-disciplinary journal indices that would support the new program, including:

- **Agricola** - This database contains bibliographic records from the U.S. Department of Agriculture's National Agricultural Library. Citations comprise journal articles, book chapters, theses, patents, software, audiovisual materials and technical reports to support all aspects of agriculture research.
- **Academic Search Complete** - Multi-disciplinary database providing indexing, abstracts, and selected full text for peer reviewed/scholarly articles, magazines, trade publications, and newspapers in all fields of study including the biological sciences.
- **Environment Complete** - This full-text database offers extensive coverage in the areas of agriculture, ecosystem ecology, energy, and affiliated areas of study. Offering full text and indexing for journals, books and monographs, it is an invaluable resource for students and scholars across all environmental disciplines.
- **ProQuest One Academic** – Research platform with access to dozens of databases. It is useful for broad subject searches in both scholarly sources and the popular media. For a more focused, scholarly work search, users can select one or more of the following databases within ProQuest: Agriculture Science Database, Biological Science database, Environmental Science Database.
- **PubMed** – Includes more than 36 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full text content from PubMed Central and publisher web sites.

- Scopus – Scopus is a large citation and abstract database covering the science and medical peer-reviewed literature.
- Web of Science – A large multidisciplinary database that includes comprehensive citation data in the science, social science, and humanities disciplines with good coverage of the biological sciences literature.

Through these databases, users are able to access full-text coverage of the periodical literature using the University Libraries' embedded openURL article linker, the "Get It" link. This service links databases to the Libraries' e-journal packages. Although, there are many other relevant biological databases on the market (e.g. BIOSIS Previews), we feel the Libraries' current selection of databases will adequately meet the needs of the program.

Journals

The University Libraries' coverage of the scholarly journal literature in ecology, evolution, and environmental biology is fairly strong. A list of key journals was compiled by combining the titles included in the relevant categories in the *Journal Citation Reports* database – Biodiversity Conservation, Biology, Ecology, Environmental Sciences, Evolutionary Biology, Genetics & Heredity, and Mathematical & Computational Biology – resulting in a list of 192 unique titles (several titles appeared in more than one category) that were ranked in the first quartile for impact. The Libraries subscribe to 157 (81.77%) of the 192 Q-1 journals (See Appendix A). Access to many of these titles is by virtue of the Libraries' subscriptions to the Wiley and Springer Nature journal packages as well as through several open access platforms. Other relevant journals are available through the Libraries' discovery tool, databases, and other journal publisher packages.

Although the Libraries' journal collection is relatively strong, we recommend the addition of the journal listed below. It is highly ranked by the *JCR*, included in the first quartile in three of the relevant categories, and relevant to several of the proposed core courses. It is also subscribed to by several libraries at universities with similar programs. Appendix B reflects the annual subscription costs to start in Year 3.

- ***Trends in Ecology & Evolution***

Monographs

An analysis of the monograph collection found that the University Libraries have a number of titles relevant to the program and that only one area of the collection – Biology / Reproduction – is lacking in scope and currency. See Table 1 for a breakdown of the monograph collection related to the curriculum of the proposed new program. To ensure that the Libraries' monographic collection adequately supports the proposed program, funding is needed to purchase approximately three additional monographs per year in the shaded subject area – Biology / Reproduction. See Appendix B for projected costs to bring the monograph collection up to date.

Table 1 – Monograph Titles; Subjects Related to the Proposed Program

LC Call Number	Subject	Number of Books (all publication years)	Number of Books (publication 2018- present)
S589.7	Agricultural ecology (General)	29	15
QH1-(199.5)	Natural history (General)	521	74
QH359-425	Biology / Evolution	333	32
QH426-470	Biology / Genetics	584	68
QH471-489	Biology/ Reproduction	26	11
QH501-531	Biology / Life	238	29
QH540-549.5	Biology / Ecology	1019	146
QK 1-989	Botany	1277	235
QL1-991	Zoology	4543	737
QR99.6-99.8	Microbiology / Cyanobacteria	18	9
QR100-130	Microbiology / Microbial ecology	150	40

Support for Current Library Resources

As noted above, University Libraries already subscribe to a number of online resources that will support a B.S. in **Ecology, Evolution, and Environmental Biology**. However, due to anticipated annual inflationary cost increases for journals and research databases (averaging 10 percent per year), the Libraries cannot guarantee that we will be able to maintain subscriptions to our current resources. Therefore, we ask that the University Libraries be given \$5,000 per year (with inflationary increases in each year) to assist us in funding these resources, especially the current journal packages that are critical to this program as well as to the broader curriculum of the Department of Biological Sciences.

Appendix A – Key Journals in Ecology, Evolution, and Environmental Biology

Compiled through a search of the JCI and the OU Libraries' Folio catalog. The OU Libraries are requesting funding for the highlighted journal on page 10.

Journal Name	Category	2022 JIF	JIF Quartile	2022 JCI	Recommended List?	Owned by KL?	Platform
Advances in Climate Change Research	ENVIRONMENTAL SCIENCES	7.4	Q1	1.16		N	
AGRICULTURE ECOSYSTEMS & ENVIRONMENT	*ECOLOGY *ENVIRONMENTAL SCIENCES	6.6	Q1	1.71		N	
AMBIO	ENVIRONMENTAL SCIENCES	6.5	Q1	0.81		Y	Springer Nature
AMERICAN JOURNAL OF HUMAN GENETICS	GENETICS & HEREDITY	9.8	Q1	2.59		Y	PMC
ANIMAL CONSERVATION	BIODIVERSITY CONSERVATION	3.4	Q1	0.83		Y	Wiley
Annual Review of Ecology Evolution and Systematics	*ECOLOGY *EVOLUTIONARY BIOLOGY	11.8	Q1	1.24	Y	Y	Annual Reviews
Annual Review of Environment and Resources	ENVIRONMENTAL SCIENCES	16.4	Q1	1.37		Y	Annual Reviews
Annual Review of Genetics	GENETICS & HEREDITY	11.1	Q1	1.36		Y	Annual Reviews
Annual Review of Genomics and Human Genetics	GENETICS & HEREDITY	8.7	Q1	1.09		Y	Annual Reviews
ATMOSPHERIC CHEMISTRY AND PHYSICS	ENVIRONMENTAL SCIENCES	6.3	Q1	1.32		Y	ProQuest Central
Biochar	ENVIRONMENTAL SCIENCES	12.7	Q1	1.58		Y	SpringerLink OA
BioData Mining	MATHEMATICAL & COMPUTATIONAL BIOLOGY	4.5	Q1	1.15		Y	SpringerLink OA
BIODIVERSITY AND CONSERVATION	BIODIVERSITY CONSERVATION	3.4	Q1	0.75		Y	Springer Nature
BIOELECTROCHEMISTRY	BIOLOGY	5.0	Q1	1.20		NC	
Biogeosciences	ECOLOGY	4.9	Q1	1.21		Y	PMC
BIOINFORMATICS	MATHEMATICAL & COMPUTATIONAL BIOLOGY	5.8	Q1	1.67		Y	Oxford
BIOLOGICAL CONSERVATION	*ECOLOGY *ENVIRONMENTAL SCIENCES *BIODIVERSITY CONSERVATION	5.9	Q1	1.43		N	
BIOLOGICAL RESEARCH	BIOLOGY	6.7	Q1	1.49		Y	PMC
BIOLOGICAL REVIEWS	BIOLOGY	10.0	Q1	2.64		Y	Wiley
Biology Direct	BIOLOGY	5.5	Q1	1.24		Y	PMC
Biology of Sex Differences	GENETICS & HEREDITY	7.9	Q1	1.39		Y	PMC
BIOSCIENCE	BIOLOGY	10.1	Q1	2.33	Y	Y	Oxford
BioScience Trends	BIOLOGY	5.5	Q1	1.34		Y	Academic Search Complete
BMC BIOLOGY	BIOLOGY	5.4	Q1	1.52		Y	PMC

BMC GENOMICS	GENETICS & HEREDITY	4.4	Q1	1.01		Y	PMC
BRIEFINGS IN BIOINFORMATICS	MATHEMATICAL & COMPUTATIONAL BIOLOGY	9.5	Q1	2.56		Y	Academic Search Complete - 1 Year Delay
BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY	BIODIVERSITY CONSERVATION	3.4	Q1	1.08		Y	Ebsco OA
CANCER GENE THERAPY	GENETICS & HEREDITY	6.4	Q1	1.24		Y	ProQuest Central - 1 Year Delay
Chemosphere	ENVIRONMENTAL SCIENCES	8.8	Q1	1.55		NC	
Circulation-Genomic and Precision Medicine	GENETICS & HEREDITY	7.4	Q1	1.50		Y	Ovid
Clinical Epigenetics	GENETICS & HEREDITY	5.7	Q1	1.25		Y	PMC
Communications Biology	BIOLOGY	5.9	Q1	1.65		Y	PMC
Communications Earth & Environment	ENVIRONMENTAL SCIENCES	7.9	Q1	1.67		Y	SpringerLink OA
COMPUTERS IN BIOLOGY AND MEDICINE	*BIOLOGY*MATHEMATICAL & COMPUTATIONAL BIOLOGY	7.7	Q1	1.63		Y	ClinicalKey
CONSERVATION BIOLOGY	*BIODIVERSITY CONSERVATION *ECOLOGY *ENVIRONMENTAL SCIENCES	6.3	Q1	1.45	Y	Y	Wiley
Conservation Letters	BIODIVERSITY CONSERVATION	8.5	Q1	1.91		Y	Wiley
CRITICAL REVIEWS IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY	ENVIRONMENTAL SCIENCES	12.6	Q1	0.77		NC	
Current Bioinformatics	*MATHEMATICAL & COMPUTATIONAL BIOLOGY	4.0	Q1	0.86		N	
CURRENT BIOLOGY	BIOLOGY	9.2	Q1	1.64		Y	Cell Press
Current Opinion in Environmental Sustainability	ENVIRONMENTAL SCIENCES	7.2	Q1	0.80		N	
Current Opinion in Insect Science	*BIOLOGY *ECOLOGY	5.3	Q1	1.37		N	
Current Pollution Reports	ENVIRONMENTAL SCIENCES	7.3	Q1	1.22		N	
Database-The Journal of Biological Databases and Curation	MATHEMATICAL & COMPUTATIONAL BIOLOGY	5.8	Q1	0.94		Y	PMC
DIVERSITY AND DISTRIBUTIONS	*BIODIVERSITY CONSERVATION *ECOLOGY	4.6	Q1	1.29		Y	Wiley
Earths Future	ENVIRONMENTAL SCIENCES	8.2	Q1	1.71		Y	Wiley
ECOGRAPHY	*BIODIVERSITY CONSERVATION *ECOLOGY	5.9	Q1	1.48		Y	Wiley
ECOLOGICAL APPLICATIONS	ECOLOGY	5.0	Q1	1.13		Y	Wiley
ECOLOGICAL ECONOMICS	*ECOLOGY *ENVIRONMENTAL SCIENCES	7.0	Q1	1.57		N	

Ecological Indicators	ENVIRONMENTAL SCIENCES	6.9	Q1	1.49		N	
Ecological Informatics	ECOLOGY	5.1	Q1	1.36		N	
ECOLOGICAL MONOGRAPHS	ECOLOGY	6.1	Q1	2.01		Y	Wiley
Ecological Processes	ECOLOGY	4.8	Q1	0.84		Y	SpringerLink OA
ECOLOGY	ECOLOGY	4.8	Q1	1.30		Y	Wiley
ECOLOGY LETTERS	ECOLOGY	8.8	Q1	2.08	Y	Y	Wiley
Ecosystem Health and Sustainability	ECOLOGY	4.9	Q1	0.79		Y	T&F Open
Ecosystem Services	*ECOLOGY *ENVIRONMENTAL SCIENCES	7.6	Q1	1.38		N	
ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY	ENVIRONMENTAL SCIENCES	6.8	Q1	1.51		N	
eLife	BIOLOGY	7.7	Q1	2.07		Y	PMC
Energy & Environmental Science	ENVIRONMENTAL SCIENCES	32.5	Q1	4.54		NC	
Energy Policy	ENVIRONMENTAL SCIENCES	9.0	Q1	1.84		N	
ENVIRONMENT INTERNATIONAL	ENVIRONMENTAL SCIENCES	11.8	Q1	1.94		N	
Environmental Chemistry Letters	ENVIRONMENTAL SCIENCES	15.7	Q1	1.05		Y	Springer Nature
Environmental Health	ENVIRONMENTAL SCIENCES	6.0	Q1	1.20		Y	PMC
ENVIRONMENTAL HEALTH PERSPECTIVES	ENVIRONMENTAL SCIENCES	10.5	Q1	2.32		Y	PMC
Environmental Innovation and Societal Transitions	ENVIRONMENTAL SCIENCES	7.2	Q1	1.44		N	
Environmental Microbiome	GENETICS & HEREDITY	7.9	Q1	1.56		Y	PMC
ENVIRONMENTAL POLLUTION	ENVIRONMENTAL SCIENCES	8.9	Q1	1.57		N	
ENVIRONMENTAL RESEARCH	ENVIRONMENTAL SCIENCES	8.3	Q1	1.82		NC	
Environmental Research Letters	ENVIRONMENTAL SCIENCES	6.7	Q1	1.21		Y	ProQuest Central
ENVIRONMENTAL SCIENCE & POLICY	ENVIRONMENTAL SCIENCES	6.0	Q1	1.04		N	
ENVIRONMENTAL SCIENCE & TECHNOLOGY	ENVIRONMENTAL SCIENCES	11.4	Q1	1.44		Y	ACS
Environmental Science & Technology Letters	ENVIRONMENTAL SCIENCES	10.9	Q1	1.42		N	
Environmental Science and Ecotechnology	ENVIRONMENTAL SCIENCES	12.6	Q1	1.64		Y	PMC
ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH	ENVIRONMENTAL SCIENCES	5.8	Q1	0.91		Y	Springer Nature
Environmental Science-Nano	ENVIRONMENTAL SCIENCES	7.3	Q1	1.13		NC	
Environmental Sciences Europe	ENVIRONMENTAL SCIENCES	5.9	Q1	0.92		Y	SpringerLink OA
Environmental Technology & Innovation	ENVIRONMENTAL SCIENCES	7.1	Q1	1.15		N	
EUROPEAN JOURNAL OF HUMAN GENETICS	GENETICS & HEREDITY	5.2	Q1	1.03		Y	PMC

EUROPEAN JOURNAL OF SOIL BIOLOGY	ECOLOGY	4.2	Q1	0.93		N	
EvoDevo	EVOLUTIONARY BIOLOGY	4.1	Q1	0.69		Y	OA
Evolution Letters	EVOLUTIONARY BIOLOGY	5.3	Q1	1.08		Y	PMC
Evolutionary Applications	EVOLUTIONARY BIOLOGY	4.1	Q1	1.04		Y	Wiley
EXCLI Journal	BIOLOGY	4.6	Q1	0.82		Y	PMC
FASEB JOURNAL	BIOLOGY	4.8	Q1	0.93	Y	Y	Wiley
Fire Ecology	ECOLOGY	5.1	Q1	1.30		Y	SpringerLink OA
FRONTIERS IN ECOLOGY AND THE ENVIRONMENT	*ECOLOGY *ENVIRONMENTAL SCIENCES	10.3	Q1	1.84	Y	Y	Wiley
Frontiers of Environmental Science & Engineering	ENVIRONMENTAL SCIENCES	6.7	Q1	0.84		Y	Springer Nature
FUNCTIONAL ECOLOGY	ECOLOGY	5.2	Q1	1.31		Y	Wiley
GENE THERAPY	GENETICS & HEREDITY	5.1	Q1	0.97		Y	ProQuest Center - 1 Year Delay
GENES & DEVELOPMENT	GENETICS & HEREDITY	10.5	Q1	2.03		Y	PMC
Genes & Diseases	GENETICS & HEREDITY	6.8	Q1	1.10		Y	PMC
GENES AND IMMUNITY	GENETICS & HEREDITY	5.0	Q1	0.67		Y	ProQuest Central - 1 Year Delay
GENETICS IN MEDICINE	GENETICS & HEREDITY	8.8	Q1	2.10		Y	ScienceDirect OA - 1 Year Delay
GENOME BIOLOGY	GENETICS & HEREDITY	12.3	Q1	3.27		Y	ProQuest Central
Genome Medicine	GENETICS & HEREDITY	12.3	Q1	2.96		Y	PMC
GENOME RESEARCH	GENETICS & HEREDITY	7.0	Q1	1.79		Y	PMC
GENOMICS	GENETICS & HEREDITY	4.4	Q1	1.10		Y	ScienceDirect OA
GENOMICS PROTEOMICS & BIOINFORMATICS	GENETICS & HEREDITY	9.5	Q1	2.07		Y	PMC
GLOBAL CHANGE BIOLOGY	*BIODIVERSITY CONSERVATION *ECOLOGY *ENVIRONMENTAL SCIENCES	11.6	Q1	2.44	Y	Y	Wiley
GLOBAL ECOLOGY AND BIOGEOGRAPHY	ECOLOGY	6.4	Q1	1.59	Y	Y	Wiley
Global Ecology and Conservation	BIODIVERSITY CONSERVATION	4.0	Q1	0.97		Y	ScienceDirect OA
GLOBAL ENVIRONMENTAL CHANGE-HUMAN AND POLICY DIMENSIONS	ENVIRONMENTAL SCIENCES	8.9	Q1	2.40		NC	
Horticulture Research	GENETICS & HEREDITY	8.7	Q1	2.21		Y	PMC
HUMAN GENE THERAPY	GENETICS & HEREDITY	4.2	Q1	0.97		N	
HUMAN GENETICS	GENETICS & HEREDITY	5.3	Q1	1.02		Y	Springer Nature

Human Genomics	GENETICS & HEREDITY	4.5	Q1	1.03		Y	PMC
IEEE Journal of Biomedical and Health Informatics	MATHEMATICAL & COMPUTATIONAL BIOLOGY	7.7	Q1	1.78		Y	IEEE
Interdisciplinary Sciences-Computational Life Sciences	MATHEMATICAL & COMPUTATIONAL BIOLOGY	4.8	Q1	1.09		NC	
Interface Focus	BIOLOGY	4.4	Q1	0.97		Y	PMC
INTERNATIONAL JOURNAL OF SUSTAINABLE DEVELOPMENT AND WORLD ECOLOGY	ECOLOGY	5.6	Q1	0.97		NC	
International Soil and Water Conservation Research	ENVIRONMENTAL SCIENCES	6.4	Q1	1.36		Y	ScienceDirect OA
ISME Journal	ECOLOGY	11.0	Q1	2.59	Y	Y	PMC
JOURNAL OF ANIMAL ECOLOGY	ECOLOGY	4.8	Q1	1.84		Y	Wiley
JOURNAL OF APPLIED ECOLOGY	*BIODIVERSITY CONSERVATION *ECOLOGY	5.7	Q1	1.37		Y	Wiley
Journal of Cleaner Production	ENVIRONMENTAL SCIENCES	11.1	Q1	1.53		Y	ScienceDirect
JOURNAL OF ECOLOGY	ECOLOGY	5.5	Q1	1.46	Y	Y	Wiley
Journal of Environmental Informatics	ENVIRONMENTAL SCIENCES	7.0	Q1	1.24		Y	Environment Complete
Journal of Environmental Management	ENVIRONMENTAL SCIENCES	8.7	Q1	1.46		NC	
Journal of Environmental Sciences	ENVIRONMENTAL SCIENCES	6.9	Q1	1.25		NC	
Journal of Ethnobiology and Ethnomedicine	BIODIVERSITY CONSERVATION	3.6	Q1	0.85		Y	PMC
Journal of Genetics and Genomics	GENETICS & HEREDITY	5.9	Q1	0.89		N	
JOURNAL OF HAZARDOUS MATERIALS	ENVIRONMENTAL SCIENCES	13.6	Q1	1.93		Y	ScienceDirect OA
JOURNAL OF INDUSTRIAL ECOLOGY	ENVIRONMENTAL SCIENCES	5.9	Q1	0.94		Y	Wiley
JOURNAL OF INHERITED METABOLIC DISEASE	GENETICS & HEREDITY	4.2	Q1	1.02		Y	Wiley
JOURNAL OF MOLECULAR MEDICINE-JMM	GENETICS & HEREDITY	4.7	Q1	0.94		Y	Springer Nature
JOURNAL OF TOXICOLOGY AND ENVIRONMENTAL HEALTH-PART B-CRITICAL REVIEWS	ENVIRONMENTAL SCIENCES	7.2	Q1	0.84		N	
Lancet Planetary Health	ENVIRONMENTAL SCIENCES	25.7	Q1	4.23		Y	ClinicalKey
LANDSCAPE AND URBAN PLANNING	ECOLOGY	9.1	Q1	2.28		NC	
LANDSCAPE ECOLOGY	ECOLOGY	5.2	Q1	1.18		Y	Springer Nature
Life Science Alliance	BIOLOGY	4.4	Q1	1.28		Y	PMC
MAMMAL REVIEW	ECOLOGY	4.9	Q1	1.04		Y	Wiley
Marine Pollution Bulletin	ENVIRONMENTAL SCIENCES	5.8	Q1	1.51		N	

MATHEMATICAL BIOSCIENCES	MATHEMATICAL & COMPUTATIONAL BIOLOGY	4.3	Q1	0.89		N	
Methods in Ecology and Evolution	ECOLOGY	6.6	Q1	1.76		Y	Wiley
MITOCHONDRION	GENETICS & HEREDITY	4.4	Q1	0.74		N	
Mobile DNA	GENETICS & HEREDITY	4.9	Q1	1.16		Y	PMC
Molecular Autism	GENETICS & HEREDITY	6.2	Q1	1.46		Y	PMC
MOLECULAR BIOLOGY AND EVOLUTION	*EVOLUTIONARY BIOLOGY *GENETICS & HEREDITY	10.7	Q1	2.19	Y	Y	PMC
MOLECULAR ECOLOGY	ECOLOGY - SCIE	4.9	Q1	1.24	Y	Y	Wiley
Molecular Ecology Resources	*ECOLOGY*EVOLUTIONARY BIOLOGY	7.7	Q1	1.62		Y	Wiley
MOLECULAR PHYLOGENETICS AND EVOLUTION	EVOLUTIONARY BIOLOGY	4.1	Q1	1.07	Y	NC	
MOLECULAR THERAPY	GENETICS & HEREDITY	12.4	Q1	2.72		Y	PMC
MUTATION RESEARCH-REVIEWS IN MUTATION RESEARCH	GENETICS & HEREDITY	5.3	Q1	0.82		N	
Nature Climate Change	ENVIRONMENTAL SCIENCES	30.7	Q1	5.18		Y	ProQuest Central - 1 Year Delay
Nature Ecology & Evolution	*ECOLOGY *EVOLUTIONARY BIOLOGY	16.8	Q1	3.93		Y	ProQuest Central - 1 Year Delay
NATURE GENETICS	GENETICS & HEREDITY	30.8	Q1	9.35		Y	Springer Nature
Nature Reviews Earth & Environment	ENVIRONMENTAL SCIENCES	42.1	Q1	4.00		N	
NATURE REVIEWS GENETICS	GENETICS & HEREDITY	42.7	Q1	6.24		Y	Springer Nature
Nature Sustainability	ENVIRONMENTAL SCIENCES	27.6	Q1	4.22		N	
NeoBiota	*BIODIVERSITY CONSERVATION *ECOLOGY	5.1	Q1	1.34		Y	Academic Search Complete
npj Clean Water	ENVIRONMENTAL SCIENCES	11.4	Q1	1.76		Y	SpringerLink OA
npj Genomic Medicine	GENETICS & HEREDITY	5.3	Q1	1.34		Y	PMC
npj Systems Biology and Applications	MATHEMATICAL & COMPUTATIONAL BIOLOGY	4.0	Q1	1.16		Y	SpringerLink OA
ONCOGENE	GENETICS & HEREDITY	8.0	Q1	1.56		Y	ProQuest Central - 1 Year Delay
One Earth	ENVIRONMENTAL SCIENCES	16.2	Q1	1.79		Y	ScienceDirect OA - 1 Year Delay
People and Nature	*BIODIVERSITY CONSERVATION *ECOLOGY	6.1	Q1	1.58		Y	Wiley
Perspectives in Ecology and Conservation	BIODIVERSITY CONSERVATION	4.7	Q1	1.33		Y	ScienceDirect OA

PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES	BIOLOGY	6.3	Q1	1.46	Y	Y	Royal Society Online Journals
Physics of Life Reviews	BIOLOGY	11.7	Q1	1.33		N	
PHYSIOLOGICAL GENOMICS	GENETICS & HEREDITY	4.6	Q1	0.70		Y	Ebsco OA - 1 Year Delay
Plant Genome	GENETICS & HEREDITY	4.2	Q1	1.08		Y	Wiley
Plants People Planet	*BIODIVERSITY CONSERVATION *ECOLOGY	5.1	Q1	1.13		Y	Wiley
PLOS BIOLOGY	BIOLOGY	9.8	Q1	2.03	Y	Y	PMC
PLoS Computational Biology	MATHEMATICAL & COMPUTATIONAL BIOLOGY	4.3	Q1	1.11		Y	PMC
PLoS Genetics	GENETICS & HEREDITY	4.5	Q1	1.31		Y	PMC
PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES	*BIOLOGY *ECOLOGY *EVOLUTIONARY BIOLOGY	4.7	Q1	1.22		Y	Royal Society Online Journals
QUARTERLY REVIEW OF BIOLOGY	BIOLOGY	6.5	Q1	0.72	Y	Y	Chicago Complete
Remote Sensing in Ecology and Conservation	ECOLOGY	5.5	Q1	1.22		Y	Wiley
REMOTE SENSING OF ENVIRONMENT	ENVIRONMENTAL SCIENCES	13.5	Q1	2.45		N	
Research Synthesis Methods	MATHEMATICAL & COMPUTATIONAL BIOLOGY	9.8	Q1	2.00		Y	Wiley
RESOURCES CONSERVATION AND RECYCLING	ENVIRONMENTAL SCIENCES	13.2	Q1	1.66		N	
REVIEWS IN ENVIRONMENTAL SCIENCE AND BIO- TECHNOLOGY	ENVIRONMENTAL SCIENCES	14.4	Q1	1.02		Y	Springer Nature
Reviews of Environmental Contamination and Toxicology	ENVIRONMENTAL SCIENCES	6.0	Q1	0.70		NC	
SAUDI JOURNAL OF BIOLOGICAL SCIENCES	BIOLOGY	4.4	Q1	1.09		Y	PMC
Science China-Life Sciences	BIOLOGY	9.1	Q1	1.76		NC	
Science of The Total Environment	ENVIRONMENTAL SCIENCES	9.8	Q1	1.68		Y	ScienceDirect
Sustainability Science	ENVIRONMENTAL SCIENCES	6.0	Q1	0.99		Y	Springer Nature
Sustainable Chemistry and Pharmacy	ENVIRONMENTAL SCIENCES	6.0	Q1	0.86		N	
Systematic Biology	EVOLUTIONARY BIOLOGY	6.5	Q1	2.06	Y	Y	Oxford
SYSTEMATIC ENTOMOLOGY	EVOLUTIONARY BIOLOGY	4.8	Q1	1.62		Y	Wiley
THEORETICAL AND APPLIED GENETICS	GENETICS & HEREDITY	5.4	Q1	1.41		Y	Springer Nature
TRENDS IN ECOLOGY & EVOLUTION	*ECOLOGY *EVOLUTIONARY BIOLOGY *GENETICS & HEREDITY	16.8	Q1	1.89	Y	N	

Trends in Environmental Analytical Chemistry	ENVIRONMENTAL SCIENCES	11.2	Q1	1.30		N	
TRENDS IN GENETICS	GENETICS & HEREDITY	11.4	Q1	1.43		Y	ClinicalKey
Urban Climate	ENVIRONMENTAL SCIENCES	6.4	Q1	1.27		N	
Waste Management	ENVIRONMENTAL SCIENCES	8.1	Q1	1.15		N	
WATER RESEARCH	ENVIRONMENTAL SCIENCES	12.8	Q1	2.15		Y	PMC
Water Research X	ENVIRONMENTAL SCIENCES	7.5	Q1	1.40		Y	ScienceDirect OA
WILDLIFE MONOGRAPHS	ECOLOGY	4.4	Q1	2.10		Y	Wiley
Wiley Interdisciplinary Reviews-Computational Molecular Science	MATHEMATICAL & COMPUTATIONAL BIOLOGY	11.4	Q1	1.31		Y	Wiley
Wiley Interdisciplinary Reviews-Water	ENVIRONMENTAL SCIENCES	8.2	Q1	1.13		Y	Wiley

NC - Subscription is not current - older issues may be available

Appendix B – Proposed Five-Year Budget for Library Resources to Support a B.S. in Ecology, Evolution, and Environmental Biology

Appendix B-Revised
Library Budget for Proposed B.S. in Ecology, Evolution, and Environmental Biology

	Year 1		Year 2		Year 3		Year 4		Year 5	
Monographs ¹	\$	918	\$	1,010	\$	1,111	\$	1,222	\$	1,344
Trends in Ecology & Evolution ²					\$	5,330	\$	5,863	\$	6,449
Support for current resources ²	\$	5,000	\$	5,500	\$	6,050	\$	6,655	\$	7,321
Total	\$	5,918	\$	6,510	\$	12,491	\$	13,740	\$	15,114

¹Presumes the purchase of 3 ebooks per year in the 1 identified LC classification, with a 10% annual inflationary increase

²Presumes a 10% annual inflationary increase

Cc Polly Boruff-Jones, Dean of University Libraries
Julia Rodriguez, University Libraries Representative to the University Senate

APPENDIX G – University Assessment Plan
(Integrated Assessment Plan – Program & Capstone Course)

Program name: **B.S. in Ecology Evolution and Environmental Biology (EEEB)**

Name of General Education Capstone Course(s): **BIO 4974 - Ecology and Evolution Capstone**

School or College in which your program resides: **Arts and Sciences**

Program level (check all that apply):

- | | |
|-----------|-------------------------------------|
| Undergrad | ☒ |
| Master's | ☐ |
| Doctoral | ☐ |

Date most recent assessment report submitted: **2024**

Current assessment contact representative (& email): **Tom Raffel (raffel@oakland.edu)**

Current department or program chair (& email): **Gerard Madlambayan**

Current Dean (& email): **Elaine Carey**

Accreditation body: **Higher Learning Commission**

Type of Assessment Plan:

Option A. Programs that have an external accrediting agency other than the Higher Learning Commission may be eligible to use their accreditor's response in lieu of following the UAC's standard process. These programs use the UAC's 'external accreditation mapping' form instead of this form. Programs without external accreditation should proceed to option B.

***Option B.** If you are not accredited by an external body (or your accreditor's standards do not meet the standards set by the Higher Learning Commission), then proceed to Steps 3-5 to create your assessment plan.

Definitions of Learning Outcome categories in this document:

University Learning Outcomes (ULOs):

- **Information literacy** - build an integrated set of abilities that allow them to be INFORMATION LITERATE citizens who reflectively discover information, understand how that information is produced and valued, and use information ethically to create new knowledge and participate as lifelong learners in society
- **Effective communication** - become EFFECTIVE COMMUNICATORS who analyze rhetorical situations, adapt their discourse to diverse genres and media, treat their sources and source material ethically, and meet the expectations of a variety of discourse communities in the academy and beyond
- **Social awareness** - become generous, SOCIALLY AWARE, citizens who demonstrate their intercultural competence and consider the ethical implications of their words, actions, and engagement with or indifference to other communities.
- **Critical thinking** - develop into CRITICAL THINKERS capable of comprehensively exploring issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion

General Education requirements:

- General Education Student Learning Outcomes (GESLOs) for the Capstone course:
 - (1) Demonstrate appropriate uses of a variety of methods of inquiry and a recognition of ethical considerations that arise.
 - (2) Demonstrate the ability to integrate the knowledge learned in general education and its relevance to the student's life and career.
- Writing Intensive in the major – students will gain a depth in discipline-specific writing skills.

Student Learning Outcomes (SLOs): (organized into 3 general areas: Knowledge, Skills, & Dispositions)

- **Knowledge** – Students will demonstrate advanced knowledge and competence in five areas: (K1) Physiology; (K2) Genetics; (K3) Ecology; (K4) Evolution; and (K5) Systematics.
- **Skills** – Students will demonstrate skills in each of five categories: (S1) Scientific method; (S2) Quantitative reasoning; (S3) Interdisciplinary practices; (S4) Communication & collaboration.
- **Dispositions** – Students will adopt values and inclinations needed for successful science-related careers including: (D1) scholarly behavior, (D2) integrity, (D3) professionalism, and (D4) open-mindedness.

Program Learning Outcomes (PLOs) – detailed learning outcomes for EEEB majors categorized within Knowledge, Skills, and Dispositions areas.

- See attached Curriculum Map for a detailed list of Program Learning Outcomes (PLOs) associated with each SLO category, showing how PLOs map to program requirements to ensure comprehensive coverage throughout the major.

Program Goals	(2) Program SLOs, Gen Ed Capstone GESLOs, and ULOs	Assessment Measures
Knowledge (K) Goal: To ensure students possess advanced knowledge of ecology, evolution, and environmental biology. Each specific Knowledge outcome will be Introduced, Reinforced, and Accomplished across the major (≥ 7x coverage; see attached Curriculum Map)	SLO-Knowledge: Students will demonstrate advanced knowledge and competence for PLOs in five areas (K1–K5): 1. Physiology – how cells, tissues, and organs interact to carry out chemical and physical functions in living organisms 2. Genetics – genes, genetic variation, and heredity 3. Ecology – relationships among organisms and environment that drive patterns of distribution and abundance 4. Evolution – how and why organisms change & diversify 5. Systematics - taxonomic classification and nomenclature Relevant ULO: Information literacy	• Performance on comprehensive exit exam to be completed during Capstone (BIO 4974). Exam questions will be designed with input from instructors of courses used to Accomplish PLOs within each Knowledge area (see attached Curriculum Map). • Program exit survey (Appendix 1) as an indirect measure • Alumni Survey as an indirect measure (Appendix 1)
Skills (S) Goal: To ensure students possess skills needed for a successful career related to ecology, evolution, and environmental biology. Each specific Skill outcome will be Introduced, Reinforced, and Accomplished multiple times throughout the major (minimum 19x coverage; see attached Curriculum Map)	SLO-Skills: Students will demonstrate key skills in each of four categories: (S1) Scientific method; (S2) Quantitative reasoning; (S3) Interdisciplinary practices; (S4) Communication & collaboration.	• Program exit survey as an indirect measure (Appendix 1) • Alumni Survey as an indirect measure (Appendix 1)
	S1. Scientific method – use the scientific process to advance knowledge of the natural world. Relevant ULOs: Critical thinking & Information literacy	• Written Paper from Capstone (BIO 4974) - rubric area of “Critical Analysis & Strength of Argument” (Appendix 1) • Oral Presentation from Capstone (BIO 4974) - “Analysis” rubric area (Appendix 3)
	S2. Quantitative reasoning - use mathematical, computational, and graphical models to analyze data and evaluate predictions of scientific hypotheses Relevant ULO: Critical thinking	• Oral Presentation from Capstone (BIO 4974) - rubric areas of “Analysis” and “Discussion & Further Studies” (Appendix 3)
	S3. Interdisciplinary practices – synthesize ideas from peer-review literature and analyze societal connections and ethical implications of ecology, evolution, and environmental biology. Relevant ULO: Social awareness	• Written Paper from Capstone (BIO 4974) - rubric area of “Critical Analysis & Strength of Argument” (Appendix 2)

Program Goals	(2) Program SLOs, Gen Ed Capstone GESLOs, and ULOs	Assessment Measures
	S4. Communication and collaboration – effectively work together in collaborative teams and communicate scientific ideas through writing & oral presentation. Relevant ULO: Effective communication	• Written Paper from Ecology & Evolution Capstone, BIO 4974 – all rubric areas (Appendix 2) • Oral Presentation from Capstone, BIO 4974 –all rubric areas (Appendix 3)
Dispositions (D) Goal: Students will adopt values and inclinations needed for success. Disposition PLO's are Reinforced throughout the major.	SLO-Dispositions: Students will adopt values and inclinations needed for success in science-related careers, including: (1) scholarly behavior, (2) integrity, (3) professionalism, and (4) open-mindedness. Relevant ULO: Social awareness	• Program exit survey as an indirect measure (Appendix 1) • Resume/CV assignment • Alumni Survey as an indirect measure (Appendix 2)

Step 4: Participation in Assessment Process

Participants in Assessment Process	Specific role(s)
Ecology Evolution & Environmental Biology (EEEB) Committee: committee of 3-5 faculty members involved in teaching EEEB required courses or with related research or professional experience.	The committee will meet regularly to discuss the EEEB curriculum, course schedule, and program implementation. For assessment purposes, data collection tasks will be delegated to committee members who will then compile a short report on the findings and share the report with the committee. Committee members will discuss and edit these short reports and contribute to writing the EEEB assessment report. This committee will also consider potential changes to the Program, as needed. This committee will also consider feedback from the University Assessment Committee and provide recommendations on curricular changes and assessment plan updates to the full department faculty.
EEEB Committee Chair	The committee chair will present EEEB assessment reports and proposed changes to the Assessment Plan to the Department Chair and Assessment Committee. Feedback from the University Assessment Committee and proposed changes to the program or assessment plan will be brought to the attention of the EEEB Committee and Curriculum Committee. Changes significant enough to require UCUI review will be presented for consideration by the full Department Faculty.
Departmental Curriculum Committee	This committee will review proposed changes to the EEEB program that have been initiated by the EEEB committee, prior to consideration by the full departmental faculty.

Participants in Assessment Process	Specific role(s)
Departmental Assessment Committee	This committee will review regular EEEB Assessment Reports and proposed changes to the EEEB Assessment Plan that have been initiated by the EEEB committee, prior to consideration by the full departmental faculty.
Department Faculty	The Department Faculty are responsible for approving changes to the EEEB specific list of departmental goals and associated student learning outcomes, including the detailed list of Program Learning Outcomes (PLOs: see attached Curriculum Map). The full faculty will consider assessment reports, recommendations from the University Assessment Committee, and proposals to make significant changes to the EEEB Program or EEEB Assessment Plan. Faculty will and give input into changes to the program curriculum or assessment plan based on assessment data and recommendations. Individual faculty are responsible for aligning course learning outcomes with the program learning outcomes covered by their courses (see attached Curriculum Map). Instructors of courses used to achieve core requirements will also participate in designing and revising embedded exam questions to evaluate student achievement of Knowledge PLO's. Individual instructors of the EEEB Capstone (BIO 4974) will participate in paper & presentation evaluation and data collection to assess student achievement of Skill PLO's
Department Chair	The Department Chair will appoint members of the EEEB Committee and monitor progress on collecting, analyzing, and reporting assessment data. They will coordinate activities with other relevant committees (e.g., Assessment & Curriculum) and participate in presenting assessment reports and proposed changes to the full faculty or relevant College or University committees, as needed.

Plan for Analyzing and Using Assessment Results to Improve Program

A. How will you analyze your assessment data?

The Department of Biological Sciences has full faculty-approved departmental goals and student learning outcomes for the EEEB major, which broadly fall into the three categories of Knowledge, Skills, and Dispositions (see above table and attached Curriculum Map). All of our SLOs used for program assessment target these specific categories, each of which includes specific Program Learning Outcomes (PLOs). Analysis of assessment data will ensure that the program is successful at adhering to these departmental goals.

Individual members of the EEEB Committee will collect, analyze, and report on data from each direct or indirect measure. The results will be compared to data from previous reports. For this program, there is still a lack of long-term data, and we will focus on comparisons over 2 year time frames. Each measure will be evaluated as indicated below.

Direct Measures:

1. **Performance on comprehensive exam:** To evaluate SLO-Knowledge (demonstrate advanced knowledge and competence within all five Knowledge areas), we will administer a comprehensive exam during the Ecology and Evolution Capstone course, BIO 4974. This is typically taken by students in their final semester of the major. The exam will contain multiple choice and free response questions covering the core courses used by students to Accomplish each of the PLOs within the Knowledge category (see attached Curriculum Map). Student success on this exam will be measured by the overall grade. Student achievement for individual areas within the Knowledge category (K1: Physiology; K2: Genetics; K3: Ecology; K4: Evolution; K5: Systematics) will be evaluated based on correct responses to questions aligned to specific PLO's within each area (see Curriculum Map).
2. **Written Paper from Ecology and Evolution Capstone (BIO 4974):** To evaluate SLO-Skills S1, S3, & S4 (demonstrate key skills in each of four categories), we will use a rubric (Appendix 2) to score written papers from BIO 4974. At least 2 independent EEEB committee members will evaluate each paper for program assessment purposes. Individual essay scores from specific rubric categories (Appendix 2) will be compiled and analyzed with reference to prior semesters.
 - **S1 Scientific method** ("use the scientific process to advance knowledge of the natural world"). Evaluated based on rubric area of "Critical Analysis & Strength of Argument" (Appendix 2). ULOs: Critical thinking & Information literacy.
 - **S3 Interdisciplinary practices** ("analyze the historical development of ecology, evolution, and environmental biology and their connections to ethics and society"). Evaluated based on rubric area of "Critical Analysis & Strength of Argument". ULO: Social awareness.
 - **S4 Communication and collaboration** ("effectively communicate scientific ideas through writing & oral presentation and work together in collaborative teams"). Evaluated based on all rubric areas. ULO: Effective communication.
3. **Oral Presentation from Ecology and Evolution Capstone (BIO 4974):** To evaluate SLO-Skills S1, S2, & S4 (demonstrate key skills in each of four categories), we will use a rubric (Appendix 2) to score written papers from BIO 4974. A rubric (see appendix) is used to score presentations on scientific primary literature. Each presentation was scored by the class instructor and by peers.
 - **S1 Scientific method** ("use the scientific process to advance knowledge of the natural world"). Evaluated based on "Analysis" rubric area (Appendix 3). ULOs: Critical thinking & Information literacy.
 - **S2. Quantitative reasoning** ("use mathematical, computational, and graphical models to analyze data, evaluate hypotheses, and generate predictions"). Evaluated based on rubric areas of "Analysis" and "Discussion & Further Studies" (Appendix 3). ULO: Critical thinking.

- **S4. Communication and collaboration** (“effectively communicate scientific ideas through writing & oral presentation and work together in collaborative teams”). Evaluated based on all rubric areas (Appendix 3). ULO: Effective communication.

Indirect Measures:

1. **Exit Survey & Alumni Survey** : Exit surveys will be conducted annually to graduates from the EEEB major within the past year. Alumni surveys will be conducted in parallel with exit surveys. These surveys will be evaluated for trends in student opinions on how well the program has prepared them for an EEEB-related career in terms of knowledge, skills, and dispositions. In addition, we can use this data to indirectly measure how many of the graduates are employed or have been admitted to graduate programs.

B. How will you use results to improve your program and/or your capstone course?

The EEEB program is geared towards preparing students for careers related to ecology, evolutionary biology, environmental biology, agricultural ecology, bioinformatics, zoology, botany, conservation biology, ecosystem science, ecological sustainability, or natural resource management. We want to ensure that graduates from the program possess sufficient mastery of all knowledge, skills, and experiences required for students to succeed in these career paths. We will monitor their success at achieving their goals post-graduation. If we find students are underperforming in certain knowledge or skills areas, or if we learn that students feel underprepared in specific areas, we will make program adjustments or reevaluate course-level learning outcomes to fill these gaps. We will also consider updates to assessment measures, such as changes to the comprehensive exam or altering the stringency or specificity of the rubrics.

Our analysis of the Oral Presentation from Biomedical Sciences Capstone Course (BIO 4972), Written Paper from Biomedical Sciences Capstone Course (BIO 4972) and Performance on comprehensive exam indicate we are meeting our program goals. If we find that the performance on the comprehensive exam drops in certain Knowledge areas, we can reevaluate the relevant courses to ensure that these outcomes are Accomplished by students within the major. If we find that performance on specific aspects of the Written Paper or Oral Presentation decline or fail to meet expectations, we can adjust program requirements to increase the number of courses in which students practice core skills. For example, Lab/Field courses and 4000-level lecture courses are required to incorporate summative assessment of written assignments and/or oral presentations.

Appendix 1. Survey Questions

Exit Survey Questions:

- How would you rate your overall satisfaction of the EEEB program?
- What do you believe to be the main strengths of the EEEB program?
- What do you believe to be the main weaknesses of the EEEB program?
- Would you suggest this program to a freshman student interested in a career related to each of the following EEEB related career paths? (ecology, evolutionary biology, environmental biology, agricultural ecology, bioinformatics, zoology, botany, conservation biology, ecosystem science, ecological sustainability, natural resource management)
- What are your plans after graduation?
- Do you feel confident that your EEEB coursework and independent study (if any) have prepared you for the next step of your career progression?
- Describe any independent research you conducted while at O.U.
- What changes would you suggest that could improve the EEEB program?
- Have you applied to a graduate program, professional school, or professional position (job) related to EEEB?
- Please indicate any graduate programs, professional schools, or professional positions to which you have already applied.
- Have you been accepted into this program or hired for this position?

Alumni Survey Questions:

- Year of Graduation
- GPA at the time of graduation
- Do you feel that upon completion of your studies that you had a firm grasp of conceptual knowledge needed for success in an EEEB related career path?
- Do you feel that upon completion of your studies that you had a firm grasp of scientific and critical reasoning skills needed for success in an EEEB related career path?
- Do you feel that upon completion of your studies that you had a firm grasp of communication and collaboration skills needed for success in an EEEB related career path?
- Do you feel that upon completion of your studies you were prepared for graduate studies in EEEB related programs?
- Describe any independent research you conducted while at O.U.
- Describe your current Life and Interests
- Describe your current Professional Status

Appendix 2. Rubric for Written Paper from Ecology and Evolution Capstone (BIO 4974)

	4	3	2	1	0
Evidence and Reasoning	Selects significant and relevant facts, details, quotations or examples. Assesses the strengths and limitations of each source, anticipating the reader's knowledge level and concerns. Uses reputable references.	Selects mostly significant and relevant facts, details, quotations or examples. Assesses the strengths and limitations of each source. Uses reputable references.	Selects somewhat significant and relevant facts, details, quotations or examples. OR sources are not reputable references.	Facts, details, quotations or examples are either insignificant or missing.	No evidence provided.
Critical Analysis & Strength of Argument	Evidence supports claims. Evidence is used to build connections between society, bioethical issue and bioethical principles. Position on bioethical issue is clear.	Evidence mostly supports claims. Evidence is used to build connections between society, bioethical issue and bioethical principles. Position on bioethical issue is mostly clear.	Evidence somewhat supports claims. Evidence is used to build some connections between society, bioethical issue and bioethical principles. Position on bioethical issue is somewhat clear.	Evidence relates to claims loosely. Position on bioethical issue is somewhat clear.	Evidence does not relate to claims.
Organization and mechanics	Paper is concise, coherent, with a clear flow of ideas. Transitions are used to guide the reader. Demonstrates exemplary command of standard written English. In-text citations are in the correct format and sufficient to back up all statements drawn from outside information.	Paper is mostly concise, coherent, with a clear flow of ideas. Transitions are used to guide the reader. Mostly demonstrates exemplary command of standard written English. In-text citations are mostly in the correct format and sufficient to back up most statements drawn from outside information.	Paper is somewhat concise, coherent, with some ideas out of place. Somewhat demonstrates command of standard written English. In-text citations are present but may not be in the correct format or sufficient to back up all statements drawn from outside information.	Paper is somewhat difficult to understand with many ideas out of place. Somewhat demonstrates command of standard written English. Missing in-text citations.	Paper does not follow guidelines and is difficult to understand. Poor command of standard written English.

Appendix 3. Rubric for Oral Presentation from Ecology and Evolution Capstone (BIO 4974)

Elements	Weight	Assessment Criteria & Proficiency				Absent (0 pt)
		Advanced (4 pts)	Developed (3 pts)	Proficient (2 pts)	Underdeveloped (1 pt)	
Introduction	1	Presenters, paper and authors are introduced; Clear and concise description of the central question being addressed; significance of paper is clear, contains sufficient background needed to understand the paper	Presenters, paper and authors are introduced; Mostly clear and concise description of the central question being addressed; significance of paper is mostly clear; contains most background needed to understand the paper	Presenters, paper and authors are introduced; Somewhat clear and description of the central question being addressed; significance of paper is mostly somewhat clear; contains some background needed to understand the paper	Presenters, paper and authors are introduced; Somewhat unclear description of the central question being addressed; significance of paper is not evident or hard to understand; lacks sufficient background needed to understand the paper	Absent
Methods	0.5	Gives only the needed information to understand the results, does not give unnecessary material; shows overview of experimental flow or approach when appropriate; is aware of the audience's experimental knowledge base	Gives the needed information to understand the results, but may be too detailed; shows overview of experimental flow or approach when appropriate	Gives most of the needed information to understand the results; may outline the experimental approach with some clarity	Gives some of the needed information to understand the results	Absent
Discussion, Conclusion and Further Studies	1	Key findings are discussed and clearly related to the field of study; application of study is evident; Future work is logical and well developed with novel concepts beyond the author's point of view	Key findings are discussed and related to the field of study; Future work is logical and well developed	Key findings are discussed and related to the field of study; Future work is mostly logical and well developed	Key findings are present; Future work is somewhat logical or lacks development	Key findings and/or future work are absent.

Analysis	2	Evaluation of data is in depth, Evaluation of study is clearly articulated, well supported statements of support or shortcoming, Focused analysis on both data and overall study	Evaluation of data is in depth, Evaluation of study is mostly clearly articulated, statements of support or shortcoming are supported	Evaluation of data is present but could be more substantial, Evaluation of study is mostly clearly articulated, statements of support or shortcoming are mostly supported	Evaluation of data is missing or inaccurate, Evaluation of study is somewhat clearly articulated, statements of support or shortcoming are somewhat supported	Evaluation of data is missing. Evaluation of study is missing.
Organization	2	Holds audience's attention, maintains focus throughout, clear transitions, follows time guidelines, content introduced in a logical sequence, main points are emphasized	Mostly focused on the topics, transitions could be more clear, provides a "road-map for listeners", follows time guidelines, content introduced in a mostly logical sequence, main points are given	Somewhat focused on the topics, transitions could be more clear, presentation is somewhat too short or long, content introduced in a somewhat logical sequence, main points are somewhat unclear	Somewhat focused on the topics, transitions could be more clear, presentation is largely too short or long, content introduced in a somewhat logical sequence, main points are unclear	Disorganized in places, lacking transitions, presentation is largely too short or long, content illogically placed, main points are unclear or absent
Ability to answer questions	1	Anticipates audience questions; Understands audience questions; Can integrate knowledge to answer questions; Thoroughly and accurately responds to questions	Understands audience questions; Can integrate knowledge to answer questions; Responses may lack details or accuracy	Attempts to answer questions; May not understand audience questions; Responses may lack details or accuracy	Does not attempt to answer questions or answers with vague and inaccurate responses	Does not answer questions

March 25, 2024

RE: Ecology, Evolution, and Environmental Biology program

To Whom It May Concern:

I am writing in enthusiastic support of the proposed program in **Ecology, Evolution, and Environmental Biology** in the Department of Biological Sciences.

As the chair of the department, I believe this program will be a valuable addition to our current offerings, which currently include a major in Biology and in Biomedical Sciences. This program will greatly benefit Oakland University students and the broader community by meeting industry needs and providing students with the knowledge and skills for careers in this expanding field, which is in high demand in Michigan. The Ecology, Evolution, and Environmental Biology program will make OU competitive in this educational area, in comparison to other regional institutions, and allow us to recruit a new population of students that are interested in this field.

Furthermore, the proposed program aligns and strengthens the expertise of the faculty in our department. The curriculum is designed with a mixture of course offerings that are either already existing or new courses, all of which will be taught by faculty with the experience in various aspects of ecology, evolutionary biology or environment biology. Teaching labs associated with the program will be taught in already existing spaces, including the newly proposed labs. The faculty associated with the program come from diverse backgrounds and are excited about teaching and mentoring our students in this field. This is a timely addition, as faculty from these areas in our department collectively have funding that totals over 3 million dollars. We are thus well prepared to provide successful and meaningful undergraduate research experiences to students in this program.

I am committed to providing all necessary resources required to ensure the success of this program. We are requesting new TA lines to help run the proposed laboratory courses, due to the expected increased enrollment in established labs required by this program, as well as the new lab components. Additionally, a new CT is requested to help organize and run these teaching labs. I fully support this new program and feel it will allow the Department of Biological Sciences to recruit and train students (new to OU) to work in this growing industry. With the Ecology, Evolution, and Environmental Biology program, we will increase OU's visibility and reputation as a leader in these fields.

Warm Regards,



Dr. Gerard J. Madlambayan

Oakland University
North Foundation Hall, Room 103
318 Meadow Brook Road
Rochester, MI 48309-4454

Oakland University:

I am hereby providing support for the inclusion of a Bachelor of Science (BS) degree program in Ecology, Evolution, & Environmental Biology in the Department of Biological Sciences at Oakland University.

There are currently only three universities within an hour radius surrounding this laboratory providing a similar curriculum in Ecology, Evolution, and Environmental Biology. However, only two of these degree programs are even within the state with only one being in the Detroit area. An additional program is within this hour-radius but is not located in the United States providing a further barrier for recent graduates in this field. These schools and programs typically provide good candidates with a strong foundation in ecology and environmental sciences suitable for hiring on an annual or semi-annual basis. Continually, because of their areas of focus, these programs also promote research partnerships and collaboration from the internship level and all the way up to larger multi-year projects across primary investigators.

Yet, beyond these select programs, many new hires from other powerhouse institutions only appear exceptional on paper with great grades and recommendations. Upon graduation, many of these students are lacking the acumen beyond a general biology background that is actually better suited for a career in the biomedical field. As a manager of a research laboratory for fisheries and aquatic ecology, when some recent graduates are hired, they are seemingly missing intangibles related to real-world applications in ecology. Many individuals have not experienced a breadth of field laboratories or hands-on experimentation with a range of scenarios and equipment typical of our operations requiring further, and sometimes continuous, on-site training and preventing independence with our research teams.

Therefore, I fully support the creation of this program further enhancing the educational foundation of Oakland University and strengthening the ecological knowledge within the southeastern Michigan area.

Respectfully,

Kevin Keeler

Wetlab Manager

Great Lakes Science Center

U.S. Geological Survey



Sept 19, 2024

Dr. Gerard Madlambayan
Chair
Professor of Biological Sciences
Department of Biological Sciences
Oakland University
Rochester, MI 48309

Re: Support letter for BS in Ecology, Evolution and Environmental Biology

Dear Dr. Madlambayan,

I am writing this letter to enthusiastically support the proposed BS in Ecology, Evolution and Environmental Biology in the Department of Biological Sciences. After reviewing the proposal and discussing the program with you and your faculty, I am in full support of its development and planned implementation.

This new program will add an important degree for Biological Sciences students and, most importantly, will provide targeted training for those students interested in career in ecology, evolution, and environmental biology. The careful development of this program reflects an attention to current curricular demands that you identified during a curriculum mapping process that clearly shows a need for the training in new skills that this program proposes. Some of these skills (e.g., technical writing, quantitative computing) are in high demand within and outside of biology, thus making this program applicable to students beyond the Biological Sciences department. The EEEB proposal builds on the skills of the faculty in the department and resources and assets of Oakland University. Moreover, these degrees and skills are sought by local and county governments, nonprofits, and industry, and the degree will prepare students to continue their education in graduate or professional school.

This program will also expand our use of the unique outdoor facilities that Oakland's campus offers, such as the Biological Preserve, and LORACS that make our campus uniquely positioned to offer an innovative and competitive program.

College of Arts and Sciences

Varner Hall, Room 217 | 371 Varner Drive, Rochester, Michigan 48309-4485
(248) 370-2140 | Fax (246) 370-4280 | oakland.edu/cas



For these reasons, I am in full support of the BS in Ecology, Evolution and Environmental Biology program and look forward to its implementation in the curriculum.

Sincerely,

A handwritten signature in black ink, appearing to read "Elaine Carey". The signature is fluid and cursive, with a large initial "E" and "C".

Elaine Carey, Ph.D.

College of Arts and Sciences

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APPENDIX I. University Communications and Marketing Assessment Report

Organic Marketing Recommendations

Work with unit marketing coordinator/director and UCM to develop support materials/content.

- Create student and faculty stories, including original photoshoots in labs/classrooms. Stories to be used on website, marketing pieces and ad creative
- Write marketing copy to promote program to add to webpage
- Create list of keywords for search engine optimization and use in program information and ads
- Participate in appropriate academic visit days or admissions events
- Involve faculty in any available PR/media stories related to program

Paid Media Marketing Recommendations

The objective of the BS in Ecology Evolution and Environmental Biology media campaign is to generate awareness of the new program and degree opportunity. The chart below outlines the media tactics to reach the Adult 18-24 demographic in the primary and secondary counties.

MEDIA	TARGET	RATIONALE	FLIGHT	ESTIMATED IMPRESSIONS	ESTIMATED NET COST
Digital	A18-24 interested in Biology, Ecology or Evolution in primary/secondary counties	Target spends 20+ hours online per week	2/1 – 4/30/25	2M	\$13,875
Paid Search*	Primary/Secondary Counties	85% of the target audience use Google	January – June 2025	CPC	(Brand Budget)
Facebook/Instagram	A18-24 in primary/secondary counties Interests: Biology (science), Ecology (science) & Evolutionary Science	Target spends 5+ hours on social media per day 75% of the target audience use Facebook	January – June 2025 (two flights per month)	600,000	\$6,000
IG Stories and Reels	A18-24 in primary/secondary counties Interests: Biology (science), Ecology (science) & Evolutionary Science	65% of the target audience use Instagram	January – June 2025 (one flight per month)	300,000	\$3,000
Agency Fee					\$2,125.00
Total:					\$25,000.00

*Paid search – Paid search is an impactful tactic to promote the new program. A campaign/Ad Group would be developed to include those searching for data science programs. Costs are absorbed by the overall OU marketing budget

SBRC Proforma Template

Ecology Evolution & Environmental Biology

FY2025

Most Likely Scenario

	Year 1	Year 2	Year 3	Year 4	Year 5
Est. New Students to Program	15	20	25	27	27
1st Year Cohort Revenue	\$ 253,800	\$ 338,400	\$ 423,000	\$ 456,840	\$ 456,840
2nd Year Cohort Revenue	\$ -	\$ 253,800	\$ 338,400	\$ 423,000	\$ 456,840
3rd Year Cohort Revenue	\$ -	\$ -	\$ 277,088	\$ 369,450	\$ 461,813
4th Year Cohort Revenue	\$ -	\$ -	\$ -	\$ 277,088	\$ 369,450
Gross Tuition Revenue	\$ 253,800	\$ 592,200	\$ 1,038,488	\$ 1,526,378	\$ 1,744,943
Less: Avg Financial Aid (30%)	\$ (76,140)	\$ (177,660)	\$ (311,546)	\$ (457,913)	\$ (523,483)
Net Tuition Revenue	\$ 177,660	\$ 414,540	\$ 726,941	\$ 1,068,464	\$ 1,221,460
Expenses					
Salaries					
Faculty Salaries	6101	\$ 68,000	\$ 69,700	\$ 69,700	\$ 69,700
Visiting Faculty	6101				
Administrative Professionals	6201				
Clerical Technical	6211	\$ 46,816	\$ 47,753	\$ 48,709	\$ 49,684
Administrative IC	6221				
Faculty Inload/Replacement Costs	6301				
Faculty Overload	6301				
Part-Time Faculty	6301				
Graduate Assistant	6311	\$ 28,495	\$ 56,990	\$ 92,610	\$ 128,230
Casual/Temp	6401				
Out of Classification	6401				
Student Labor	6501				
Total Salary Expense		\$ 28,495	\$ 171,806	\$ 210,063	\$ 246,639
Fringe Benefits	6701	\$ -	\$ 52,465	\$ 53,660	\$ 54,137
Total Compensation		\$ 28,495	\$ 224,271	\$ 263,723	\$ 300,776
Operating Expenses					
Supplies and Services	7101	\$ 2,000	\$ 5,000	\$ 6,000	\$ 6,000
Graduate Tuition	7101	29,280	58,560	87,840	117,120
E-Learning Support	7102				
Travel	7201				
Equipment	7501	\$ 11,000	\$ 2,000	\$ 2,000	\$ 2,000
Maintenance	7110				
Recruitment and advertising	7101	\$ 25,000	\$ 10,000	\$ 20,000	\$ 20,000
Library	7401	\$ 5,918	\$ 6,510	\$ 12,491	\$ 13,740
Faculty Startup Funding					
Total Operating Expenses		\$ 73,198	\$ 82,070	\$ 128,331	\$ 158,860
Total Expenses		\$ 101,693	\$ 306,341	\$ 392,054	\$ 459,636
University Overhead		\$ 45,000	\$ 105,000	\$ 180,000	\$ 261,000
Net Income (Loss)		\$ 30,967	\$ 3,199	\$ 154,887	\$ 347,828

¹The tuition calculations do not account for any attrition of students.