Term Information

Effective Term	Autumn 2024
Previous Value	*Summer 2012*

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Change to 5000-level

Change to 3 credit hours

Change in content of course to broaden focus beyond museum collections

What is the rationale for the proposed change(s)?

The current course (EEOB 6340), which primarily focuses on managing large data sets in museum collections and their applications in conservation biology and global change biology, has served as a valuable foundation for students. However, the rapidly changing landscape of scientific research and the increasing importance of open biodiversity data collected across broad spatial and temporal extents necessitate a reevaluation and expansion of the course content. In addition, changing to 5000-level will allow undergraduates to enroll in the course. Changes to credit hours reflect redesign of course content and delivery. Please see attached document for additional information.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the requrest contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Evol, Ecology & Organismal Bio
Fiscal Unit/Academic Org	Evolution, Ecology & Org Bio - D0390
College/Academic Group	Arts and Sciences
Level/Career	Graduate, Undergraduate
Previous Value	*Graduate*
Course Number/Catalog	5360
Previous Value	*6340*
Course Title	Biodiversity Informatics
Transcript Abbreviation	Biodiv Informatics
Course Description	This course will provide students with the knowledge and practical skills to access, manage, analyze, and utilize biodiversity data for scientific research and conservation efforts. The course covers a comprehensive understanding of diverse biodiversity data sources and introduces a range of analytical, statistical, and computational tools essential for biodiversity data analysis.
Previous Value	*Methods for managing large data sets and applications in modeling, conservation biology, and global change.*
Semester Credit Hours/Units	Fixed: 3
Previous Value	*Fixed: 4*

Offering Information

Length Of Course	14 Week, 12 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	EEOB 3410, or EEOB 3310.01, or EEOB 3310.02, or permission of instructor.
Previous Value	*Prereq: Permission of instructor.*
Exclusions	
Electronically Enforced	Yes
Previous Value	**No**

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.1303
Subsidy Level	Doctoral Course
Intended Rank	Senior, Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- • Understand the importance of biodiversity informatics in conservation and ecological research.
- • Recognize the pivotal role of environmental data in advancing biodiversity studies.
- • Be able to retrieve, manage, and analyze environmental data using various databases and tools.
- • Develop an understanding of diverse sources of biodiversity data.
- • Understand the role of phylogenetics and trait-based ecology in biodiversity informatics.
- • Be able to analyze biodiversity data to answer ecological questions.
- • Understand the complexity of biodiversity and be able to select most appropriate biodiversity metrics to answer specific research questions.
- • Develop data visualization and communication skills to effectively convey biodiversity information.

Previous Value

Content Topic List

- Primary occurrence data
- Development of information models
- Niche modeling
- Data standards and protocols
- Applications in conservation & climate change
- Database management systems
- Artificial Intelligence and Biodiversity
- Measuring multi-faceted biodiversity
- Traits and functional diversity
- Phylogenetic and genetic diversity

Previous Value

- *Primary occurrence data*
- *Development of information models*
- *Niche modeling*
- *Data standards and protocols*
- *Applications in conservation & climate change*
- *Database management systems*

Sought Concurrence Yes

Previous Value **No**

Attachments

- EEOB_5xxx_BiodiversityInformatics_Syllabus (002).docx: New Syllabus

  (Syllabus. Owner: Hamilton,Ian M)

- BiodivInfoSyll_EEOB6349.pdf: Old Syllabus

  (Syllabus. Owner: Hamilton,Ian M)

- EEOB Curriculum Maps Oct 2023.xlsx: curriculum maps

  (Other Supporting Documentation. Owner: Hamilton,Ian M)

- EEOB_5xxx_BiodiversityInformatics_JustificationForRedesign.docx: justification

  (Cover Letter. Owner: Hamilton,Ian M)

- concurrence_cse.pdf: Concurrence - CSE

  (Concurrence. Owner: Hamilton,Ian M)

- concurrence_statistics.pdf: Concurrence - Stats

  (Concurrence. Owner: Hamilton,Ian M)

- EEOB_5360_BiodiversityInformatics_Syllabus_R1.docx: Revised Syllabus - 1/22/2024

  (Syllabus. Owner: Hamilton,Ian M)

- EEOB5360_ResponsesToCommitteeComments.docx: Response to committee

  (Cover Letter. Owner: Hamilton,Ian M)

Comments

- Please see Subcommittee feedback email sent 12/15/2023. *(by Hilty,Michael on 12/15/2023 12:22 PM)*
- Concurrence requested from and obtained from CSE and Statistics *(by Hamilton,Ian M on 11/30/2023 08:39 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Hamilton,Ian M	11/30/2023 08:39 AM	Submitted for Approval
Approved	Hamilton,Ian M	11/30/2023 08:39 AM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	12/01/2023 12:00 PM	College Approval
Revision Requested	Hilty,Michael	12/15/2023 12:22 PM	ASCCAO Approval
Submitted	Hamilton,Ian M	01/22/2024 01:52 PM	Submitted for Approval
Approved	Hamilton,Ian M	01/22/2024 01:53 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	01/24/2024 12:40 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Neff,Jennifer Vankeerbergen,Bernadette Chantal Steele,Rachel Lea	01/24/2024 12:40 PM	ASCCAO Approval

Dear Natural and Mathematical Sciences Subcommittee of the ASC Curriculum Committee,

I have received the Subcommitte's feedback on the EEOB 5360 (Biodiversity Informatics) syllabus. I have carefully considered all the comments and addressed each one accordingly. Below, you will find my responses highlighted in blue font as per the committee's requests.

Please do not hesitate to reach out should you have any questions.

Yours sincerely,

Marta A. Jarzyna, Ph.D.
Assistant Professor | Department of Evolution, Ecology and Organismal Biology
Core Faculty | Translational Data Analytics Institute
420 Aronoff, 318 W. 12th Ave., Columbus, OH 43210
Email: jarzyna.1@osu.edu
Phone: 978-587-5938
Web: http://jarzynalab.com/

EEOB 5360
The Subcommittee declined to vote on the proposal at this time and would like to see the following feedback items addressed within a revision:

- The Subcommittee would like to see additional information surrounding the course project, which accounts for 50% of a student's final grade, within the course syllabus. Specifically, they would like to see how this project will be scaffolded over the course of the semester, what the expectations are for students with respect to their time (how long should they expect to spend per week on the project, when they should be expected to begin working on the project, etc.), what supports and resources the instructor will be providing to students as they work through this project, and any other information that would be relevant to student success on the course project.

  Response:
  I have revised the committee's comment by providing additional details regarding the expectations related to students' time. Additionally, I have included a comprehensive list outlining the components of the semester-long project. The updated syllabus section for the project now reads as follows:

  > ***SEMESTER-LONG PROJECT.*** *Each student will work on an individual project for the course. In this project, the student will identify a particular research question within the broader Biodiversity Informatics field. Using the tools and resources covered in class, the student will aggregate and analyze existing biodiversity data to address this question. Project evaluation will be based on both the content and the application and documentation of the diverse informatics tools utilized (see below). While the weekly commitment may vary, students are anticipated to allocate an average of 4 hours per week to this comprehensive semester-long project. Total points for semester-long project = 500 (50%). Outlined below is the schedule detailing the components of the project along with the corresponding point allocation. The instructor will provide verbal feedback on each component of the project during either class or office hours.*

Semester-Long Project Components:

Week 3: Proposal
Students will submit a project proposal (1 page) outlining their chosen biodiversity research topic and the intended methodologies or tools they plan to utilize.
Feedback: Instructor will provide verbal feedback on the proposal to guide students in refining their approach.
Deliverable: Proposal (1 page)
Points: 50

Weeks 4-6: Data Collection and Processing
Students will identify and gather relevant biodiversity data from diverse sources; students will preprocess and clean the data for analysis; students will perform necessary data wrangling tasks for integration (if multiple datasets are used).
Deliverable: None (This phase aims to ensure continuous progress on the project without a specific output). Nonetheless, students are encouraged to engage with the instructor for guidance and feedback during this step.
Points: 0

Weeks 7-10: Analysis and Visualization
Students will apply informatics tools and techniques to analyze and visualize biodiversity patterns or trends; students will create visual representations (graphs, maps, etc.) to communicate findings effectively. Students will submit graphs and maps to instructor.
Feedback: Instructor will provide verbal feedback on analysis and visualization to guide students in refining their approach.
Deliverable: Maps and graphs
Points: 100

Weeks 11-14: Interpretation and Report Writing
Students will interpret results derived from the analysis and prepare a comprehensive report in a form of a peer-reviewed scientific article.
Deliverable: Final report
Points: 250

Weeks 13-14: Oral Presentation
Students will present their project findings, methodologies, and conclusions using visual aids (slides, diagrams, etc.).
Deliverable: Oral presentation in class
Points: 100

- The Subcommittee would like to see clarification on the course readings within the course syllabus. Given that the course readings are not explicitly mentioned within the syllabus, it is unclear how long the instructor expects students to spend on the course readings each week and what level of rigor the readings will be (such as if there are peer-reviewed, data-intensive articles or more popular media sources). Additionally, to this point, they believe it would also be helpful to provide additional clarity to the reading summary assignments that explains to students the recommended length of the summaries to help speak to student workload expectations.

Response:

I have revised the syllabus by providing additional details about the reading assignments. The syllabus now reads as follows:

> ***READINGS.*** *Prior to most lectures, students will read one assigned peer-reviewed article and submit a short summary of that article via Carmen. All articles will be a peer-reviewed literature and will focus on the major conceptual and theoretical aspects of the field. The article summaries are aimed at assessing students' comprehension of the article's main idea, and should be succinct and not exceeding 200 words. The articles' summaries must be submitted by 11:59 p.m. the day before the lecture to receive any points. In weeks when readings are assigned (constituting 50% of course meetings), students should allocate approximately 2 hours per article. Total points for reading assignments = 250 (25%).*

- The Subcommittee recommends adding a technology statement to the course syllabus that will explain the proper utilization of technology (such as electronic devices) during class time and, especially, what devices students should expect to bring to each class session in order to be successful.

Response:

The technology statement has been added to the syllabus and reads as follows:

> ***COURSE TECHNOLOGY:***
> *For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. In-person support information is available at https://it.osu.edu/help, and support via phone or email is available 24/7.*
> - ***Self-Service and Chat support:*** *go.osu.edu/IT*
> - ***Phone:*** *614-688-4357(HELP)*
> - ***Email:*** *servicedesk@osu.edu*
>
> *BASELINE TECHNICAL SKILLS FOR COURSES*
> - *Basic computer and web-browsing skills*
> - *Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.*
> - *Basic familiarity with R and RStudio is welcome but nnot required.*
>
> *REQUIRED EQUIPMENT*
> - *Personal computer (laptop): current Mac (OS X) or PC (Windows 7+) with high-speed internet connection.*
> - *Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication should such a necessity arise*
>
> *REQUIRED SOFTWARE*
> - *Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help.*
> - *R ad RStudio statistical software. R software can be downloaded free of charge from https://www.r-project.org/, and RStudio can be downloaded free of charge from https://posit.co/download/rstudio-desktop/.*

CARMEN ACCESS
You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- *Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.*
- *Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.*
- *Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.*

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

- The Subcommittee recommends clarifying the workload expectation statement (as found on page 1 of the syllabus) to be the standard for a 3-credit hour course. As a reminder, the standard for a 3-credit hour, 14-week semester course is that each course week should have 3 hours of direct instruction with 6 hours of out-of-classroom instruction/activities in order for a student to earn a letter grade of "C".

Response:
The workload expectation statement has been revised to the standard for a 3-credit hour course.

Syllabus
EEOB 5360: Biodiversity Informatics
Autumn 2024

FACULTY INSTRUCTOR:
Dr. Marta Jarzyna jarzyna.1@osu.edu
Office: 420 Aronoff
Office hours: TBD

COURSE DESCRIPTION: This course will provide students with the knowledge and practical skills to access, manage, analyze, and utilize biodiversity data for scientific research and conservation efforts. The course covers a comprehensive understanding of diverse biodiversity data sources and introduces a range of analytical, statistical, and computational tools essential for biodiversity data analysis.

Prerequisites: EEOB 3410, EEOB 3310, or permission of instructor.

COURSE LEARNING OBJECTIVES: The student who successfully completes this course will:

- Understand the importance of biodiversity informatics in conservation and ecological research.
- Recognize the pivotal role of environmental data in advancing biodiversity studies.
- Be able to retrieve, manage, and analyze environmental data using various databases and tools.
- Develop an understanding of diverse sources of biodiversity data.
- Be able to retrieve and manage biodiversity data using various databases and tools.
- Understand the role of phylogenetics and trait-based ecology in biodiversity informatics.
- Be able to analyze biodiversity data to answer ecological questions.
- Understand the complexity of biodiversity and be able to select most appropriate biodiversity metrics to answer specific research questions.
- Develop data visualization and communication skills to effectively convey biodiversity information.

HOW THIS COURSE WORKS

FORMAT OF INSTRUCTION: Lecture + hands on excercises during the lecture hour

MODE OF DELIVERY: This course is taught entirely in person.

NUMBER OF CONTACT HOURS PER WEEK: 3 hours, 1.5h twice a week

CREDIT HOURS AND WORK EXPECTATIONS: This is a 3-credit-hour course. According to Ohio State policy (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

COURSE TECHNOLOGY:
For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. In-person support information is available at https://it.osu.edu/help, and support via phone or email is available 24/7.

- **Self-Service and Chat support:** go.osu.edu/IT
- **Phone:** 614-688-4357(HELP)
- **Email:** servicedesk@osu.edu

BASELINE TECHNICAL SKILLS FOR COURSES

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.

- Basic familiarity with R and RStudio is welcome but nnot required.

REQUIRED EQUIPMENT

- Personal computer (laptop): current Mac (OS X) or PC (Windows 7+) with high-speed internet connection.
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication should such a necessity arise

REQUIRED SOFTWARE

- Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help.
- R ad RStudio statistical software. R software can be downloaded free of charge from https://www.r-project.org/, and RStudio can be downloaded free of charge from https://posit.co/download/rstudio-desktop/.

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- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

GRADING

The grades for the course will be based on three components: readings, in-class assignments, and semester-long project.

READINGS. Prior to most lectures, students will read one assigned peer-reviewed article and submit a short summary of that article via Carmen. All articles will be a peer-reviewed literature and will focus on the major conceptual and theoretical aspects of the field. The article summaries are aimed at assessing students' comprehension of the article's main idea, and should be succinct and not exceeding 200 words. The articles' summaries must be submitted by 11:59 p.m. the day before the lecture to receive any points. In weeks when readings are assigned (constituting 50% of course meetings), students should allocate approximately 2 hours per article. Total points for reading assignments = 250 (25%).

IN-CLASS ASSIGNMENTS. Most lectures will elaborate on and present a broader perspective on the peer-reviewed readings and will include a short computational assignment related to those readings and the theme of the lecture. Those assignments will be due at the end of a lecture period, should be completed entirely within the in-person meeting without necessitating additional time outside the class. Total points for in-class assignments = 250 (25%).

SEMESTER-LONG PROJECT. Each student will work on an individual project for the course. In this project, the student will identify a particular research question within the broader Biodiversity Informatics field. Using the tools and resources covered in class, the student will aggregate and analyze existing biodiversity data to address this question. Project evaluation will be based on both the content and the application and documentation of the diverse informatics tools utilized (see below). While the weekly commitment may vary, students are anticipated to allocate an average of 4 hours per week to this comprehensive semester-long project. Total points for semester-long project = 500 (50%). Outlined below is the schedule detailing the components of the project along with the corresponding point allocation. The instructor will provide verbal feedback on each component of the project during either class or office hours.

Semester-Long Project Components:

Week 3: Proposal
Students will submit a project proposal (1 page) outlining their chosen biodiversity research topic and the intended methodologies or tools they plan to utilize.
Feedback: Instructor will provide verbal feedback on the proposal to guide students in refining their approach.
Deliverable: Proposal (1 page)
Points: 50

Weeks 4-6: Data Collection and Processing
Students will identify and gather relevant biodiversity data from diverse sources; students will preprocess and clean the data for analysis; students will perform necessary data wrangling tasks for integration (if multiple datasets are used).
Deliverable: None (This phase aims to ensure continuous progress on the project without a specific output). Nonetheless, students are encouraged to engage with the instructor for guidance and feedback during this step.
Points: 0

Weeks 7-10: Analysis and Visualization
Students will apply informatics tools and techniques to analyze and visualize biodiversity patterns or trends; students will create visual representations (graphs, maps, etc.) to communicate findings effectively. Students will submit graphs and maps to instructor.
Feedback: Instructor will provide verbal feedback on analysis and visualization to guide students in refining their approach.
Deliverable: Maps and graphs
Points: 100

Weeks 11-14: Interpretation and Report Writing
Students will interpret results derived from the analysis and prepare a comprehensive report in a form of a peer-reviewed scientific article.
Deliverable: Final report
Points: 250

Weeks 13-14: Oral Presentation
Students will present their project findings, methodologies, and conclusions using visual aids (slides, diagrams, etc.).
Deliverable: Oral presentation in class
Points: 100

HOW YOUR GRADE IS CALCULATED:

ASSIGNMENT CATEGORY	POINTS
Pre-lecture readings: Summaries	250
In-lecture assignments	250
Semester-long project	500
TOTAL	**1000**

The following scale will be used to determine your grade:

≥93% = A 90-92.99% = A- 87-89.99% = B+ 83-86.99% = B 80-82.99% = B-

77-79.99% = C+ 73-76.99% = C 70-72.99% = C- 67-69.99% = D+ 60-66.99% = D

≤60% = E

COURSE SCHEDULE

Week	Date	Class #	Broad Theme	Topic	Assignment
1	TBD	1	General Overview	• Course overview: What is Biodiversity Informatics • Importance of biodiversity data	• Paper reading
	TBD	2	Environmental Informatics	• Intro to Environmental Informatics	• Paper reading
2	TBD	3	Environmental Informatics	• Ground-based environmental data in biodiversity studies • Remotely-sensed environmental data in biodiversity studies • Accessing and downloading environmental data	• In-class assignment
	TBD	4	Environmental Informatics	• Modeled climate data (Worldclim, CHELSA) • Past climate estimate and future projections	• Paper reading
3	TBD	5	Biodiversity occurrence data	• Biodiversity occurrence data repositories (GBIF, iNaturalist, eBird) • Importance of citizen science initiatives Accessing and downloading biodiversity data	• In-class assignment
	TBD	6	Biodiversity occurrence data	• Modeling ecological niches using species occurrence data	• Paper reading • Semester-long project: Proposal
4	TBD	7	Biodiversity occurrence data	• Species distribution modeling I	• Paper reading
	TBD	8	Biodiversity occurrence data	• Species distribution modeling II	• In-class assignment
5	TBD	9	Biodiversity occurrence data	• Measuring spatiotemporal changes in species abundances and distributions	• In-class assignment
	TBD	10	Museum collections	• Importance of museum collections to biodiversity studies • OSU's Museum of Biological Diversity	• Paper reading
6	TBD	11	Museum collections	• Efforts to digitize biodiversity specimens (iDigBio)	• N/A
	TBD	12	Phylogenetic and genetic diversity	• Phylogenetics and its role in biodiversity studies • Building the tree of life	• Paper reading
7	TBD	13	Phylogenetic and genetic diversity	• Genomic data resources (e.g., GenBank) • Accessing and downloading GenBank data	• In-class assignment
	TBD	14	Phylogenetic and genetic diversity	• Phenotypic data resources (e.g., MorphoBank)	• Paper reading
8	TBD	15	Traits and functional diversity	• Traits and their role in biodiversity studies • What is a functional trait and how to choose which ones to use?	• Paper reading

	TBD	16	Traits and functional diversity	• Trait databases and trait development efforts (e.g., TRY, EltonTraits) • Accessing and downloading trait data	• In-class assignment
9	TBD	17	Measuring multi-faceted biodiversity	• Quantifying taxonomic diversity (Species Richness, Species Evenness)	• Paper reading • In-class assignment
	TBD	18	Measuring multi-faceted biodiversity	• Quantifying phylogenetic diversity (Faith's phylogenetic diversity, Mean Phylogenetic Distance)	• Paper reading • In-class assignment
10	TBD	19	Measuring multi-faceted biodiversity	• Quantifying functional diversity (Functional Richness, Functional Dispersion, Functional Evenness, Functional Originality)	• Paper reading • In-class assignment
	TBD	20	Measuring multi-faceted biodiversity	• Measuring spatiotemporal changes in taxonomic, phylogenetic, and functional diversity	• In-class assignment • Semester long project: Analysis & Visualization
11	TBD	21	Artificial Intelligence and Biodiversity	• Harnessing AI for biodiversity studies	• Paper reading
	TBD	22	Artificial Intelligence and Biodiversity	• AI for detecting species occurrence • Algorithms for camera traps, acoustics	• In-class assignment
12	TBD	23	Artificial Intelligence and Biodiversity	• AI for harvesting trait information from images	• In-class assignment
	TBD	24	Biodiversity Informatics for Conservation	• Conservation planning and prioritization	• Paper reading
13	TBD	25	Student Presentations	• Semester-long project presentations	• N/A
	TBD	26	Student Presentations	• Semester-long project presentations	• N/A
14	TBD	27	Student Presentations	• Semester-long project presentations	• N/A
	TBD	28	Student Presentations	• Semester-long project presentations	• Semester long project: Final report
Finals	TBD	**No Final Exam**			

OTHER COURSE POLICIES

ACADEMIC MISCONDUCT POLICY

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct **http://studentlife.osu.edu/csc/**.

STATEMENT ABOUT DISABILITY SERVICES

The university strives to maintain a healthy and accessible environment to support student learning in and out of the classroom. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

If you are isolating while waiting for a COVID-19 test result, please let me know immediately. Those testing positive for COVID-19 should refer to the **Safe and Healthy Buckeyes site** for resources. Beyond five days of the required COVID-19 isolation period, I may rely on Student Life Disability Services to establish further reasonable accommodations. You can connect with them at **slds@osu.edu**; 614-292-3307; or **slds.osu.edu**.

STATEMENT ON RELIGIOUS ACCOMMODATIONS
It is Ohio State's policy to reasonably accommodate the sincerely held religious beliefs and practices of all students. The policy permits a student to be absent for up to three days each academic semester for reasons of faith or religious or spiritual belief.

Students planning to use religious beliefs or practices accommodations for course requirements must inform the instructor in writing no later than 14 days after the course begins. The instructor is then responsible for scheduling an alternative time and date for the course requirement, which may be before or after the original time and date of the course requirement. These alternative accommodations will remain confidential. It is the student's responsibility to ensure that all course assignments are completed.

MENTAL HEALTH STATEMENT
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

STATEMENT ON TITLE IX
Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu.

EEOB 6340
Biodiversity Informatics – 4 credit hours
Syllabus

Instructor: Norman F. Johnson
1220 Museum of Biological Diversity
Phone: 292-6595
E-mail: johnson.2@osu.edu

Our understanding of the distribution of plants, fungi, and animals around the world is based on data from observations and the specimens stored in the world's natural history collections. These data not only document geographic distributions, but also seasonal phenology, migration patterns, history through time, and the biological associations that make up ecological communities. Much of this information is not collated in a single place, but is distributed through the published literature and collection catalogs. Electronic access to these resources is increasingly available, and the tools for storage, dissemination, and analysis of these data are the scope of the subject of biodiversity informatics.

Learning Goals: In this course I am seeking to integrate tools, standards, and protocols from the rapidly evolving field of information technologies with the data and research questions of biodiversity studies. The focus will be on the areas of systematics and evolution, but the topics covered are also applicable to many aspects of ecology and conservation. This will not be a course in computer science, programming or web page authoring. Rather, the goal is to illustrate how these subjects, skills, and tools apply to biodiversity science, both in theory and practice. Specific goals are:

- learning and application of the principles of information modeling
- familiarity with the theory, design, and use of relevant information technologies, particularly relational databases
- familiarity with the scope and standards associated with the data domains of primary species occurrence, taxonomic names, characters, and literature
- ability to find and use cutting edge web-based resources for biodiversity studies
- apply these skills to develop a comprehensive review of available information for organisms, communities, or biological phenomena (e.g., fungal-ant symbioses) of their own choosing

Class Format: This course will rely heavily on the principles of active learning by students. Class periods will include traditional lecture-style segments, but these will be liberally interspersed with discussions, small-group work, peer-teaching, and student presentations.

Grading scheme

The grades for the course will be based on three components. There will be two exams: a midterm and a final. These will deal with the major conceptual and theoretical aspects of the field. Each student will work on an individual project for the course. In this project, the student will identify a particular group of organisms (e.g., triggerfish), a type of ecological community (e.g., North American tundra), or another type of biological phenomenon (e.g., fungal-ant symbioses). For this subject, the student will use the electronic tools and resources discussed in order to aggregate the available information into a comprehensive review. Grading of this project will be based on both its content and the application and documentation of the breadth of tools used. The final grading component, the Weekly Points, will be

based on questions associated with class readings, in-class quizzes, one-minute essays, and class participation.

Midterm	100 points
Personal Project	100 points
Weekly Points	140 points
Project	100 points
Final	100 points
Total	540 points

Grading Scheme:

A:	>93%	C+:	77-79%	D:	63-65%
A-:	90-93%	C:	73-76%	E:	<63%
B+:	87-89%	C-:	70-72%		
B:	83-86%	D+:	65-69%		
B-:	80-82%				

Readings: As yet, there is no textbook for this dynamic and rapidly changing field. Readings will be based on published papers and documentation available on-line. They will include:

Chapman, A.D. 2005. Principles of data quality, version 1.0. Report for the Global Biodiversity Information Facility, Copenhagen. Http://www.gbif.org/prog/digit/data_quality.

Dallwitz, M.J. 1980. A general system for coding taxonomic descriptions. *Taxon* 29:41–46.

Dallwitz, M.J., T.A. Paine and E.J. Zurcher. 2000. Principles of interactive keys. Http://www.delta-intkey.com/

Guralnik, R.P. and D. Neufeld. 2005. Challenges building online GIS services to support global biodiversity mapping and analysis: lessons from the Mountain and Plains Database and Informatics project. *Biodiversity Informatics* 2:57–69.

Johnson, N.F. 2007. Biodiversity informatics. *Annual Review of Entomology* 52:421–438.

Lampe, K.H. and D. Striebling. 2005. How to digitize large insect collections: preliminary results of the DIG project. In *African Biodiversity: Molecules, Organisms, Ecosystems,* ed. B.A. Huber, B.J. Sinclair, K.H. Lampe, pp. 385–393. New York: Springer Science/Business Media. 443 pp.

Martínez-Meyer, E. 2005. Climate change and biodiversity: some considerations in forecasting shifts in species' potential distributions. *Biodiversity Informatics* 2:42–55.

Neale, S., M.R. Pullan and M.F. Watson. 2007. Online biodiversity resources – principles for usability. *Biodiversity Informatics* 4:27–36.

Soberón, J. and A.T. Peterson. 2004. Biodiversity informatics: managing and applying primary biodiversity data. *Philosophical Transactions of the Royal Society of London B* 359:698–698.

Soberón, J. and A.T. Peterson. 2005. Interpretation of models of fundamental ecological niches and species' distributional areas. *Biodiversity Informatics* 2:1–10.

Schedule

Week	Topics
1	Scope of the field of biodiversity informatics; fundamental structure of primary species occurrence data; information modeling; development of a model of primary species occurrence data
2	Databases and relational theory; implementation of information models in RDBMS; SQL (structured query language); stored procedures, functions, and packages; customizing output; translation of primary species occurrence information model into relational format
3	Data acquisition: work flows, data quality assurance and fitness for use, identifiers, specimen vouchers in modern biology, OCR applications of specimen labels/sheets
4	Data presentation and dissemination: integration of databases and web dissemination of results; HyperText Markup Language; eXtended Markup Language; RDF; web services, dynamic content, Web 2.0, Javascript
5	Data integration: the DiGIR and TAPIR protocols; data standards: TDWG vocabularies, the DarwinCore; global integration: GUIDs and LSIDs; Global Biodiversity Information Facility; FishNet, MaNIS, VertNet
6	Midterm Exam; development of course projects; georeferencing, BioGeomancer; niche modelling; geographic information systems
7	Taxonomic data: development of an information model for taxonomy and systematics; the Taxonomic Concept Schema; authority files
8	Data aggregators: Species 2000, uBio, Integrated Taxonomic Information System; codes of biological nomenclature and informatics: bacteria, Index Fungorum, IPNI, ZooBank, Catalog of Life
9	Character data: development of information model for qualitative, meristic, and quantitative data; DeLTA and SDD standards, taxon x char matrices, neXML; scientific applications including ScratchPads, vSysLab; molecular data: NCBI, Barcode of Life
10	Applications to identification systems: Lucid and other interactive/multientry keys; the Electronic Field Guide Project
11	Citizen Science, application to quarantine and invasive species, eBird project, Flickr, BugGuide.
12	Ontologies and character data: zebrafish anatomical ontology, teleost ontology; application and integration with gene ontologies; OBO
13	Literature data: bibliographic information; library data standards; NLM. Semantic markup and enhancements: Taxpub schema; the journal ZooKeys; automated data acquisition and markup: GoldenGate
14	Bringing it all together: screen scraping, Species Profile Model, Invasive Species Profile; Fauna Europaea, Virtual Herbarium, Atlas of Living Australia, Encyclopedia of Life

Academic Misconduct:

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academi misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the Committee on Academic Misconduct (Faculty Rule 335-5-487). For additional information, see the University's Code of Student Conduct (http://studentaffaris.osu.edu/resource_csc.asp).

Disability Services:

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the course instructor as soon as possible of their needs. The Office for Disability Services is located in room 150 Pomerene Hall, 1760 Neil Avenue; telephone 614-292-3307, TDD 292-0901; http://www.ods.ohio-state.edu.

Hamilton, Ian

From: Zhang, Yuan
Sent: Tuesday, November 21, 2023 9:54 PM
To: Arora, Anish; Kaizar, Elly; Hamilton, Ian; Sivilotti, Paul
Cc: Lee, Yoonkyung
Subject: Re: Concurrence request: EEOB 5360

Dear Ian et al,

After some discussion this afternoon, our department is pleased to give our concurrence to this request.

Best regards,
Curriculum Committee, Department of Statistics
Yoonkyung Lee and Yuan Zhang

From: Arora, Anish <anish@cse.ohio-state.edu>
Sent: Tuesday, November 21, 2023 19:03
To: Kaizar, Elly <kaizar.1@osu.edu>; Hamilton, Ian <hamilton.598@osu.edu>; Sivilotti, Paul <paolo@cse.ohio-state.edu>
Cc: Lee, Yoonkyung <yklee@stat.osu.edu>; Zhang, Yuan <yzhanghf@stat.osu.edu>
Subject: RE: Concurrence request: EEOB 5360

Dear Ian,

Appreciate the initiative.

I am likewise sharing the request with CSE curriculum committee chair Paul Sivilotti.

Not that I expect issues, but just in case the holiday and the committee's commitments and meeting schedule gets in the way, I trust he (or we) will keep you advised in case more time is needed.

With best wishes,
Anish

Anish Arora
Professor and Chair, Computer Science and Engineering
Faculty Director, 5G-OH Connectivity Center
arora.9@osu.edu

Ingrid Rivera
Executive Assistant
rivera.153@osu.edu
614-292-5973 Office
The Ohio State University

Hamilton, Ian

From: Sivilotti, Paul
Sent: Wednesday, November 29, 2023 6:33 PM
To: Hamilton, Ian; Zhang, Yuan; Arora, Anish; Kaizar, Elly
Cc: Lee, Yoonkyung
Subject: RE: Concurrence request: EEOB 5360

Hi Ian—

The CSE curriculum committee has reviewed the syllabus for the proposed course change to EEOB 5360.

I'm pleased to extend CSE's concurrence for this request.

Best wishes,
--paul

From: Hamilton, Ian <hamilton.598@osu.edu>
Sent: Wednesday, November 22, 2023 11:28 AM
To: Zhang, Yuan <yzhanghf@stat.osu.edu>; Arora, Anish <anish@cse.ohio-state.edu>; Kaizar, Elly <kaizar.1@osu.edu>; Sivilotti, Paul <paolo@cse.ohio-state.edu>
Cc: Lee, Yoonkyung <yklee@stat.osu.edu>
Subject: Re: Concurrence request: EEOB 5360

Thanks!
Ian

Get Outlook for iOS

From: Zhang, Yuan <yzhanghf@stat.osu.edu>
Sent: Tuesday, November 21, 2023 9:53:59 PM
To: Arora, Anish <anish@cse.ohio-state.edu>; Kaizar, Elly <kaizar.1@osu.edu>; Hamilton, Ian <hamilton.598@osu.edu>; Sivilotti, Paul <paolo@cse.ohio-state.edu>
Cc: Lee, Yoonkyung <yklee@stat.osu.edu>
Subject: Re: Concurrence request: EEOB 5360

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Best regards,
Curriculum Committee, Department of Statistics
Yoonkyung Lee and Yuan Zhang

From: Arora, Anish <anish@cse.ohio-state.edu>
Sent: Tuesday, November 21, 2023 19:03
To: Kaizar, Elly <kaizar.1@osu.edu>; Hamilton, Ian <hamilton.598@osu.edu>; Sivilotti, Paul <paolo@cse.ohio-state.edu>
Cc: Lee, Yoonkyung <yklee@stat.osu.edu>; Zhang, Yuan <yzhanghf@stat.osu.edu>
Subject: RE: Concurrence request: EEOB 5360