# RECORD OF ACADEMIC ACHIEVEMENT

The Evergreen State College - Olympia, Washington 98505

OFFICIAL TRANSCRIPT DOCUMENT

Elie, Jordan William — A00423588

Last, First Middle — Student ID

## DEGREES CONFERRED:

Bachelor of Science — Awarded 16 Jun 2023

## TRANSFER CREDIT:

| Start | End | Credits | Title |
|---|---|---|---|
| 03/2014 | 08/2020 | 58 | **Centralia College** |
| 03/2014 | 08/2020 | 7 | **Centralia College** |
| 03/2014 | 06/2021 | 83 | **Centralia College** |
| 03/2014 | 06/2021 | 7 | **Centralia College** |

## EVERGREEN UNDERGRADUATE CREDIT:

| Start | End | Credits | Title |
|---|---|---|---|
| 09/2021 | 12/2021 | 16 | **Vertebrate Zoology: Animal Systems, Evolution, and Ecology**<br>**4 - Zoology: Vertebrate Diversity and Evolution*<br>**6 - Zoology: Comparative Anatomy and Physiology*<br>**4 - Vertebrate Ecology and Behavior*<br>**2 - Final Project: Penguin Dive Behavior in Captivity* |
| 01/2022 | 06/2022 | 32 | **Marine Environments:Organisms and the Ocean**<br>**10 - Biological Oceanography*<br>**10 - Marine Biology*<br>**4 - Laboratory and Field work in Marine Science*<br>**4 - Research in Marine Science*<br>*4 - Seminar (Upper Division)* |
| 06/2022 | 09/2022 | 4 | **Qualitative Research Methods**<br>*4 - Qualitative Research Methods* |
| 09/2022 | 12/2022 | 16 | **Student-Originated Studies: Tribal Policy and Marine Sciences**<br>*8 - Group and Independent Studies in Tribal Law, History and Natural Resource Management of the Pacific Northwest*<br>**8 - Marine Coastal Resource Science* |
| 01/2023 | 03/2023 | 16 | **Marine Biodiversity**<br>*5 - Marine Invertebrate Zoology*<br>*3 - Marine Biodiversity*<br>*6 - Marine Invertebrate Zoology Laboratory*<br>*2 - Microscopy* |
| 01/2023 | 03/2023 | 6 | **Undergraduate Research with P. Yu**<br>**6 - Tutorial and Research in Shellfish Aquaculture* |
| 04/2023 | 06/2023 | 4 | **Statistics I and II: Accelerated**<br>*4 - Statistics I and II: Accelerated* |

## Cumulative

184 Total Undergraduate Credits Earned

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My education at The Evergreen State College evolved from a focus solely on marine biology to an academic endeavor encompassing skills in marine science, research, grant writing, and collaborative work. I chose Evergreen because of their five foci of learning and how I could apply the foci to my education; it gave me the ability to take on final projects each quarter, go on field trips and learn from diverse communities, learn from both seminars and community-based discussions, and overall, to experience an interdisciplinary style of learning centered around an emphasis in marine science. *Vertebrate Zoology*, *Marine Environments*, *Tribal Policy and Marine Sciences*, *Marine Biodiversity*, and *Undergraduate Research* in shellfish aquaculture helped me achieve this area of emphasis.

In *Vertebrate Zoology* I completed a research project on the diving and foraging behavior of African penguins in captivity. I wrote a detailed report on my research and gave a presentation on my findings. I learned how to develop and implement research ideas about the evolutionary history of vertebrates and how to evaluate the literature on the subject. I also learned from this course that I especially enjoy field research. It was through this class that I decided I would like to have an ecological focus while still staying in a marine-related field of study.

*Marine Environments* and *Marine Biodiversity* were chosen as marine-related niche courses to expand my knowledge of marine sciences. These classes involved hands-on practice with the use of compound microscopes, dissecting microscopes, and scanning electron microscopy. I completed field observations and data collection while describing marine organisms in a lab notebook. I also examined numerous genera of marine organisms from a plethora of phyla. I conducted a research project that was strictly literature based on the nudibranch, *Hermissenda crassicornis*, and wrote a research proposal to examine kleptocnidae acquisition by nudibranchs.

*Marine Environments* involved a quarter-long project on phytoplankton which refined my skills in presenting original data. By the end of *Marine Environments*, I had successfully worked in a team to develop a mock grant proposal on benthic diatoms and substrate types. This proposal gave me an insight into how scientific proposals are conducted, assessed, and awarded.

I went on two field trips to Friday Harbor Labs by the end of *Marine Biodiversity*. These field trips provided me with guided marine-related, scientific fieldwork at a lab with hands-on use of the facilities, equipment, and research on a research vessel. I also passed the operating exams needed to independently use the Leica auto montage dissecting microscope and the JEOL scanning electron microscope at The Evergreen State College.

*Tribal Marine Policy and Marine Sciences* expanded my collaborative efforts. I worked on a group project about co-management of Puget Sound salmon which helped me further develop my confidence in presenting to an audience. This course introduced me to complex topics and how to address and communicate through them. I learned about the Boldt and Rafeedi decisions and took field trips to the Squaxin Island Museum and the Olympic Peninsula, learning about and respecting the sovereignty of native peoples. I also produced a policy paper and policy brief on Inuit sovereignty within the sealing market.

*Undergraduate Research* gave me an insight into shellfish aquaculture. I enjoyed meeting up with my peers at the Evergreen Shellfish Garden, at various times, in a variety of weather conditions, and maintaining the clams, oysters, and mussels. My final project included a research proposal on microplastics in bivalves at different inlets of South Puget Sound.

I am proud of my academic success at The Evergreen State College. I entered college with a narrow focus on what I wanted to study and learn about. I have since expanded my focus by taking courses that complement my area of emphasis and have developed research and fieldwork skills; I am leaving with a confident understanding of marine science. I look forward to using my knowledge to help better understand and mitigate the challenges facing our marine environments.

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## April 2023 - June 2023: Statistics I and II: Accelerated

4 Credits

**DESCRIPTION:**
Faculty: Carri J. LeRoy

*Statistics I and II: Accelerated* created an opportunity for students to learn concepts and methods in introductory statistics at a fast pace. Students learned basic parametric and non-parametric statistical methods to analyze real-world data. Statistical concepts included probability, basic summary statistics, and a suite of nonparametric and parametric statistical tests: Student's t-tests, Chi-square tests, analysis of variance (ANOVA), simple linear regression, correlation, advanced ANOVA, classification and regression tree (CART) models, non-metric multidimensional scaling (NMDS) ordinations, and meta-analysis techniques. Students learned to interpret findings, write about their results, and create useful figures and tables. Students completed weekly readings, bi-weekly quizzes, and weekly statistics lab assignments. Final conceptual and practical exams provided students opportunities to demonstrate knowledge gained.

Students had opportunities to learn various statistical software packages this quarter, including: JMP Pro 16, JASP 0.14.1, R 4.3.0, RStudio, PAST, and basic data management in Excel.

**EVALUATION:**
Written by: Carri J. LeRoy

Jordan completed all weekly statistics lab assignments on time. The work on all labs was excellent. In fact, Jordan not only showed mastery of all statistical methods presented this quarter, but also learned to do all methods in R coding language (RStudio). Jordan should be commended for taking on the challenging task of learning a computer programming language. It is an important skill that will benefit future work and graduate studies. Jordan did consistently strong work on biweekly quizzes covering statistical concepts and methods. Jordan did exceptional work on a cumulative final exam covering statistical concepts and methods. In addition, Jordan did exceedingly strong work on a practical exam that required students to assess data, decide on appropriate statistical tests, manage data, analyze data, interpret results, and create appropriate graphs.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 4**

4 - Statistics I and II: Accelerated

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## September 2022 - March 2023: Undergraduate Research with P. Yu

6 Credits

**DESCRIPTION:**
Faculty: Pauline C. Yu, Ph.D.

This student opportunity "Undergraduate Research with P. Yu" was also known as "Advanced Research in Environmental Studies: Oyster Aquaculture," as the specific project was the maintenance of a small bivalve shellfish growing operation located at the Evergreen Beach. The learning opportunity involved in-person work during low tide events approximately every 2 weeks of the quarter, and online synchronous meetings held over video conference on the other weeks with a group-led selection of a reading and discussion topic related to bivalve biology and aquaculture.

Students were given the opportunity to increase their enrollment credits in order to pursue more advanced study in relevant topics.

**EVALUATION:**
Written by: Pauline C. Yu, Ph.D.

In fall quarter, Jordan met all the requirements of the work for this Undergraduate Research Unit on Oyster Aquaculture. Jordan attended all of the scheduled work parties, and was engaged throughout. Jordan was an engaged participant in the seminar discussions, and contributed to the decision-making on selecting topics for readings. Jordan was an excellent participant in the learning community throughout.

In winter quarter, Jorden met with distinction the requirements of the work, by increasing his participation in presenting a selected research paper to the seminar discussion, and by writing and presenting a proposal for bivalve research on the presence of microplastics in different inlets of South Puget Sound. The proposal was well-written, with solid use of primary literature for the introduction and methods, and a feasible timeline and budget. While circumstances were such that Jordan did not get an opportunity to carry out this project in the subsequent quarter as proposed, I was ready to approve and support this project to be conducted. It was a strongly written student proposal that would likely have received institutional funding in addition.

It has been an excellent experience having Jordan's participation in the activities for the stewardship of the Evergreen Shellfish Garden and supporting the learning of other students about shellfish at the Evergreen Beach. Jordan is well prepared for advanced work in marine and environmental sciences at the graduate level.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 6**

*6 - Tutorial and Research in Shellfish Aquaculture

* indicates upper-division science credit

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## January 2023 - March 2023: Marine Biodiversity

16 Credits

**DESCRIPTION:**
Faculty: Erik V. Thuesen, Ph.D. and Pauline C. Yu, Ph.D.

This program consisted of an immersive survey of marine invertebrate zoology, with lectures, laboratory and field trips with field observation and sampling. Lectures and labs covered all the major phyla (and several minor phyla) of invertebrates, their evolutionary and taxonomic relationships, anatomical features and local representative species. Additional lectures covered coral reef and estuarine ecology, comparative larval biology and zooplankton ecology. Students were assessed on the basis of 2 quizzes, 1 in-class midterm, a lab practicum and a final take home exam. Students were also assessed on the basis of a laboratory notebook of illustrations of live and preserved, intact and dissected specimens of most of the invertebrate phyla. The field trips included field observations of rocky intertidal and muddy intertidal temperate marine habitats, qualitative sampling of benthic marine sediments and quantitative sampling for biodiversity.

Instruction in microscopy techniques and hands-on training were included with the aims of students learning microscopy theory and being proficient for unsupervised operation in basic compound light microscopy, stereomicroscopy with a digital z-stacker (automontage) capability, and scanning electron microscopy. Students were assessed for their microscopy knowledge on the basis of a take-home exam, an online quiz, and practicum examination on the instruments.

For training in experimental design and scientific writing, students designed and wrote scientific proposals in small groups. They were required to demonstrate understanding of the scientific literature, appropriate citation and bibliography formatting, proposal time management and budgeting. Proposals were peer-reviewed in a mock National Science Foundation panel as part of the proposal review and revision process.

Textbook: Brusca, Giribet and Moore. 2022. *Invertebrates* (4th ed). Oxford University Press.

**EVALUATION:**
Written by Erik V. Thuesen, Ph.D.

Jordan's overall performance during winter quarter was very good. Jordan had excellent scores on the on-line quizzes, and he did very well on the in-class midterm exam with particularly good answers to questions about atoll formation and ctenophores. He did very well on the final take-home exam at the end of winter quarter. His essays were thorough and well cited.

Jordan was attentive in laboratory, developed hands-on lab skills and a broader knowledge of marine biodiversity. Jordan’s lab note book contained fine illustrations of marine organisms that were generally well labeled with taxonomic and anatomical labels. Many of them would have benefitted from further annotations. During the multi-day fieldtrip to Friday Harbor Labs, Jordan spent a considerable amount of time observing and drawing marine organisms. Jordan demonstrated good breadth and fair depth on the laboratory practical exam at the end of winter quarter. Jordan did outstanding work on the take-home exam in microscopy. He received training and passed the operating exams needed to use the automontage dissecting microscope and the JEOL scanning electron microscope without further supervision.

Jordan worked independently to develop a research proposal to examine the dynamics of kleptocnidae acquisition by nudibranchs. His proposal was thorough, if a little too ambitious, and represented an

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excellent start to this research project. During the proposal review session at the end of the quarter, Jordan presented a very good summary and constructive critique of his fellow students' work.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 16**

5 - Marine Invertebrate Zoology
3 - Marine Biodiversity
6 - Marine Invertebrate Zoology Laboratory
2 - Microscopy

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## September 2022 - December 2022: Student-Originated Studies: Tribal Policy and Marine Sciences

16 Credits

**DESCRIPTION:**
Faculty: Pauline C. Yu, Ph.D.

This one-quarter student-originated studies program focused on an interdisciplinary investigation of the relationship between tribes, inter-governmental relations and marine resources. The specific topics were selected collaboratively by faculty and students, and included salmon and salmon habitat management (including fish passage), invasive species, sea level rise and coastal use, treaties, tribal sovereignty and identity, federal and state legal structures that interact with tribal rights and natural resources, the rights of nature, food sovereignty, animal rights, local gray whale populations, and population genetics for conservation. Students attended talks from the Food Justice Symposium on campus and the 2022 South Sound Science Symposium meeting. Students visited the Squaxin Island Tribal Museum, the Makah Museum and two regional salmon hatcheries (the US Fish and Wildlife Service co-managed Quinault and Makah hatcheries). For the science labs, students practiced molecular biology skills, collected local salmon samples from stores and restaurants, and conducted a forensic DNA analysis of salmon species. Students conducted group projects based on environmental case studies from the Native Cases Institute, and wrote a policy paper with a policy brief on a topic of their choosing.

Class texts included the Medicine Creek Treaty, *United States vs. Washington* 1974 (Boldt), *United States vs. Washington* 1994 (Rafeedie), documentation about Makah Whaling (from the International Whaling Commission, the Makah Tribe petition and the National Oceanic and Atmospheric Administration) and peer-reviewed papers about related topics. The film “Angry Inuk” (2016) was screened in class.

**EVALUATION:**
Written by: Pauline C. Yu, Ph.D.

Jordan has met with exemplary distinction the requirements of this program and was a valued member of the learning community. Jordan’s attendance record was excellent. Jordan was an occasional participant in seminar, and Jordan’s participation in program service activities throughout the program was frequent. Jordan's engagement in learning was consistent and strong, and Jordan's engagement in helping classmates with learning was consistent and strong. Jordan was especially helpful in group work demonstrating teamwork skills for supporting peers and modelling agreeability. Jordan's writing skills were excellent as demonstrated in various writing assignments, which included synthesis, reflections and formulating strong, coherent and well-supported arguments.

Jordan demonstrated an overall strong understanding of the presented concepts in marine and fisheries science. Jordan completed all observations assignments, and demonstrated a consistently strong ability to collect lab data, to make notes about lab procedures and sample management, and to run a computer alignment of sequenced salmon data through completion of assigned notebook observations. Jordan thoroughly completed all notebook exercises, maintained clear and well-organized entries, and demonstrated strong engagement with the range of materials. The completed assignments consistently exceeded the requirements with regards to documentation and were well-detailed and well annotated. During the field trips at the Squaxin Island Museum and the Olympic Peninsula, Jordan participated in all the activities and Jordan's engagement in exploratory observation was strong. Jordan made excellent use of the facilities and exhibits available, and consistently demonstrated an active interest and curiosity.

Jordan was responsible for researching and writing a policy paper and policy brief on the self-selected topic of "Controlled Sealing Market: The European Union’s Control on Inuit Sovereignty." Jordan's

assignment completion on the interim assignments (project proposal, policy brief draft and bibliography) was complete. The bibliography demonstrated a well-developed understanding of information sourcing, and made strong use of primary, secondary and tertiary source material; as was relevant to the program, Jordan's bibliography was thorough and outstanding, including primary legal documents, primary scientific literature, documents from government (federal, international) agencies, documentary journalism and news reportage. Jordan's policy paper did an outstanding job of summarizing history and research, clearly articulating a cohesive argument (establishing the centrality of sealing to Inuit sovereignty and the role of the European Union's bans on seal products), identifying the intended audience and using proper citation formatting throughout.

Jordan participated in a group presentation on the case study in "Co-Management of Puget Sound Salmon: How well does the Use and Collection of Shared Fishery Science between Tribes and the State Guide Resource Protection?" The group did a solid job of presenting the background of the case, summarizing research and effects on the parties involved, and assigning relevant texts for class discussion, despite some difficulties. The group demonstrated excellent coordination on a complex topic, divvying up a lot of content to present. During the presentation, Jordan was very well prepared in presenting materials clearly and knowledgeably, and communicating with confidence. During the discussion, Jordan did an excellent job of answering questions, presenting questions for discussion and leading the discussion on the topic.

Through a demonstration of quality work in this program, Jordan demonstrated preparation to continue in advanced work at the intersection of law, policy and resource conservation sciences.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 16**

8 - Group and Independent Studies in Tribal Law, History and Natural Resource Management of the Pacific Northwest

*8 - Marine Coastal Resource Science

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## June 2022 - September 2022: Qualitative Research Methods

4 Credits

**DESCRIPTION:**
Faculty: Cali Mortenson Ellis, Ph.D.

Qualitative data is an important part of applied research. Whether it comes from interviews, focus groups, texts, internet message boards, or elsewhere, qualitative data informs our understanding of how individuals and communities view the world with depth and nuance. This asynchronous class, utilizing best practices in online education such as online assessments and collaborative reading tools, introduced students to qualitative data collection and analysis through an applied project.

Students had the opportunity to collect their own qualitative data and apply qualitative analysis tools to answer a question of interest. To this end, students developed a shared understanding of research using qualitative methods, and learned to assess what makes a piece of qualitative research “good.” Students conducted observational field research and learned to take effective field notes. Students learned how to discover and assess archival evidence at the Evergreen College Archives. Students designed and conducted a semi-structured interview, and developed a codebook for the interpretation of qualitative data. Finally, students prepared a paper that effectively reported the results of the qualitative interview and connected their learning to their understanding of qualitative data and analysis.

**EVALUATION:**
Written by: Cali Mortenson Ellis, Ph.D.

This asynchronous class required students to be disciplined, self-motivated, and conduct self-directed assignments that connected their readings to the real world for the purposes of qualitative data collection and analysis. The challenge of an asynchronous class is that it requires students to participate in learning collaboratively, sharing their insights and questions on the text not just with the faculty, but with each other. In this respect, Jordan greatly succeeded as a collaborative online learner. Jordan demonstrated that Jordan can learn and cooperate effectively in an online learning environment, and complete high quality projects on a self-directed schedule.

Jordan began the class by reflecting on Jordan's own goals for learning about qualitative research in the online asynchronous format. To practice a foundational skill of qualitative data collection, Jordan conducted a field observation over two different days and took field notes about people and their behaviors at Heritage Park in Olympia. Jordan's detailed and descriptive notes and reflection on this experience indicated Jordan's active engagement with and commitment to the process of observational qualitative data collection.

Jordan learned about how to access qualitative data stored in archives and rarely visited in the digital age by exploring the Evergreen College Archives in person. Jordan took the opportunity to examine documents from the the “Washington Worm Growers Association” collection, reporting surprising discoveries about the financial history of the worm growing industry in Washington, and developing skills working with and explaining the significance of archival materials.

An important part of the class centered around learning to conduct a semi-structured interview, transcribe the interview, and develop a qualitative codebook for the collected data. Jordan's documentation of the preparation for the semi-structured interview was very thorough and self-reflective and demonstrated important skills of reflexivity. The transcription of Jordan's interview was very well-done, and showed facility with up-to-date transcription resources. Finally, the qualitative codebook for the interview developed by Jordan was outstanding and creative, clearly incorporating best practices from the readings and demonstrating a thoughtful approach to the overall process of coding.

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Jordan's commitment to learning and practicing the difficult process of qualitative coding resulted in a thorough and reflective Qualitative Analysis Final Paper that reviewed the process and outcomes of qualitative data collection to the larger enterprise of social science research. Based on this, Jordan demonstrated the skill and commitment to effectively pursue further research using qualitative data collection and analysis techniques.

Even in the asynchronous class environment, I truly appreciated having Jordan as a student and learning about how Jordan approached the readings and assignments. Jordan was a committed student willing to tackle the challenges of qualitative data collection in social science research.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 4**

4 - Qualitative Research Methods

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## January 2022 - June 2022: Marine Environments:Organisms and the Ocean

32 Credits

**DESCRIPTION:**
Faculty: Gerardo Chin-Leo, Ph.D. and Pauline C. Yu, Ph.D.

This two-quarter long program studied marine environments focusing on the ecology and adaptations of marine life. The material was presented through a wide range of activities that provided opportunities to learn field and lab skills and to apply learning to the design and implementation of research projects.

**Lectures** covered major themes in biological oceanography and marine biology such as ocean structure/ dynamics/circulation/sediments and chemistry, primary and secondary productivity, characteristics and adaptations of major groups of organisms and ecological principles (population dynamics, biogeography, trophic relationships, competition and symbiosis).The ecology of selected habitats including estuaries, rocky intertidal, coral reefs, polar regions and the deep sea was examined. Current research in microbial and larval ecology and marine mammal research were also presented. Finally, students developed an understanding of human impacts on marine environments through eutrophication, aquaculture, fisheries, invasive species and global climate change. Students were evaluated through workshop exercises, homework, quizzes, and midterm and final exams.

**Laboratory and fieldwork** taught various sampling procedures and analytical methods. Fieldwork included an oceanographic survey of a local estuary, a visit to a local wetland to observe shorebird migrations, and a 4-day long field trip to the Friday Harbor Labs of the University of Washington (San Juan Islands) to collect and identify marine organisms and study rocky intertidal habitats. Laboratory work included training in the use of liquid handling instruments, compound and dissecting microscopes, scanning electron microscope (SEM) as well as learning methods to measure nutrients (dissolved inorganic nitrogen) and dissolved oxygen (Winkler titration). Students completed labs with observations of live phytoplankton and zooplankton, mollusk dissections (bivalve and cephalopod) and comparative bivalve gonad histology. A quantitative methods workshop presented statistical methods (e.g., accuracy and precision, descriptive statistics, t-test, ANOVA, regression, sample size determination and Chi-Square). Data generated in lab and in the field were analyzed with these statistics using Excel spreadsheets.

In **winter quarter seminar,** students gained insights into the scientific process and how scientific results are communicated to both experts and the public. Students analyzed a wide range of scientific publications including review articles, research papers and proposals submitted to the National Science Foundation and a book on marine infectious diseases. Each student also examined how scientific information is communicated to the general public by presenting articles published in the popular literature. In **spring quarter seminar**, each student presented two primary literature scientific papers of their choice. These talks were in the style of a scientific conference presentation focusing on the results and methods of the study. Students wrote summaries of all the articles presented by the other students and also gave brief presentations of current news article relevant to program themes.

There were two **library-based research** projects where students read primary literature relevant to their project and developed scientific writing and citation skills. In the first project, students researched the ecology of a **marine organism** of their interest presenting their findings through a written report and oral presentation. The second project was a team effort to collaboratively **design a research project** be conducted in locally within one year. Each team wrote a formal proposal that included a thorough review of the literature pertinent to the research topic, formulation of research questions-hypotheses, experimental/field study design, equipment needs, and a detailed timeline. Students presented each other's proposals, evaluating their intellectual merit and ranking the proposals.

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Students applied the field, laboratory and statistical methods that they learned by completing **two field research projects** each lasting 3 weeks. One project was a characterization of the infaunal and larval ecology of the Evergreen Beach, to determine the roles of beach location on bivalve diversity and abundance and to observe the variation in bivalve reproductive maturity and barnacle settlement over time. Students measured species richness and abundance in benthic transects, assessed bivalve gonad histology and measured metamorphic and settlement rates between substrates. The second project was to examine changes in phytoplankton species composition, biomass and abundance at a local estuary (Budd Inlet) and determine the environmental parameters that could explain those changes. Students measured physical and chemical parameters of the water column and collected water samples from docks and using a small boat. In the lab, they analyzed water samples for chlorophyll a, nutrients (nitrogen, phosphorus and silicate) and used light and scanning electron microscopes to identify and enumerate phytoplankton species. At the end of the quarter, students in teams selected one of the two project data sets to analyze and presented their findings in a professional conference style oral presentation. In addition, each student submitted an abstract of their team's findings to demonstrate that they understood the results of the collaborative data analysis.

TEXTBOOKS: Marine Ecology: Processes, Systems, and Impacts, Kaiser et al. Oxford University Press and Essentials of Oceanography, Trujillo and Thurman. Prentice Hall. Ocean Outbreak, Harvell. UC Press. In addition, students read numerous scientific articles from the primary literature.

**EVALUATION:**
Written by: Gerardo Chin-Leo, Ph.D. and Pauline C. Yu, Ph.D.

Jordan met with exemplary distinction the requirements of this program. Jordan's attendance was perfect, and Jordan enthusiastically engaged in all program activities contributing positively to the learning of all the students. Jordan completed all the required work, and overall, his work was excellent demonstrating a strong handle of the material. In addition, Jordan demonstrated very good written and oral communication skills and the ability to effectively work independently and collaboratively.

Jordan's quiz and exam scores in winter quarter were fair reflecting some gaps. However, in spring, his exam scores were excellent showing substantial progress as well as solid understanding of the spring quarter material, which focused on the ecology of marine habitats. Jordan's strong understanding of the material was also reflected in his lab reports, which were consistently very good. In this work, Jordan demonstrated knowledge of the concepts relevant to each activity as well as a good ability to apply the statistics needed for the analysis of the data. Jordan completed all field observations assignments and demonstrated a very good ability to observe and describe marine organisms through maintaining the field observations notebook. During the field trip at Friday Harbor Labs, Jordan enthusiastically participated in all the activities, and Jordan's engagement in exploratory observation was very good. Jordan made very good use of the facilities and organisms available, and consistently demonstrated active interest and curiosity.

Jordan completed all seminar assignments showing understanding of the scientific papers examined. Jordan's essays were organized and clearly written containing thorough summaries of the topics and content in the primary literature. Jordan gave two presentations on articles published in the primary literature. One was on adaptations of hydrothermal vent limpets and the second one was on the role of coral reef mesopredators. In addition, Jordan presented news articles on how seagrasses nutritional values vary with temperature and on how the attachment of bacteria to plastics affects their transport in the deep sea. Through these presentations, Jordan demonstrated a solid understanding of the technical details of the scientific literature as well as the challenges of communicating scientific findings to the general public. Jordan's presentations were very good with substantial information presented in organized and clear slides. Jordan effectively conveyed the information and did a great job on answering questions. Jordan also did a very good job on the written summaries of all the articles presented by other

students. These annotated bibliographies were detailed showing a thorough understanding of concepts and methods presented in primary literature articles.

In winter quarter, Jordan's library research project was on the nudibranch, *Hermissenda crassicornis*. Jordan successfully completed this project making use of primary and tertiary source material. Jordan's written report did an outstanding job of summarizing primary research, demonstrating understanding of the methods and results. Furthermore, the report was organized, clearly written and followed standard citation formatting. Jordan also did an excellent job in the oral presentation of this project. Jordan's talk focused on selected research findings on *H. crassicornis*ci chemotaxis. This presentation provided further evidence of Jordan's excellent understanding of the sources examined.

Jordan and a collaborator were responsible for completing the researching, writing and presenting on a group proposal of "Early Benthic Diatom Settlement on Artificial and Natural Substrates in an Urbanized Estuary Within South Puget Sound" where they proposed to experimentally compare the colonization of microalgae on manmade and natural materials right off of the Evergreen Beach. The group's assignment completion on the interim assignments (project proposal, and rough draft) was complete, and Jordan's assignment completion on the individual assignments (draft annotated bibliography and final annotated bibliography) was complete. Jordan's bibliographies demonstrated a well-developed understanding of information sourcing, and made strong use of primary and secondary source material. The group's final proposal paper did an excellent job of summarizing primary research, demonstrating understanding of the research, designing research to address hypotheses, understanding of logistics and work distribution, creatively addressing broader impacts and using proper citation formatting. The proposal was well-received by classmates and placed second in the mock panel exercise. Jordan received excellent feedback and praise from the collaborator regarding Jordan's work habits, collaborative skills, leadership and conflict resolution. Jordan's collaborator specifically noted the contributions to research and that Jordan "has fantastic writing skills."

Jordan participated in the field research activities by completing lab and field work for both the beach and phytoplankton projects. For the data analysis exercise, Jordan, with 4 other students, chose to examine the phytoplankton data. Jordan's team did an excellent job of analyzing the data, which included many physical, chemical, biological and meteorological measurements over various space and time scales. The team effectively identified the various hypotheses to be tested and equitably distributed the work. Their presentation of the results was excellent with an organized and clear report of salient trends and a logical discussion on the possible explanations for the observed changes in phytoplankton during the study period. Jordan's contribution to the team effort was substantial focusing on the analysis of silicate, nutrient ratios and determining variations of the several physical/chemical measurements over small space scales. Through this project, Jordan demonstrated a very good ability to analyze data and to work collaboratively.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 32**

*10 - Biological Oceanography
*10 - Marine Biology
*4 - Laboratory and Field work in Marine Science
*4 - Research in Marine Science
*4 - Seminar

* indicates upper-division science credit

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## September 2021 - December 2021: Vertebrate Zoology: Animal Systems, Evolution, and Ecology

16 Credits

**DESCRIPTION:**
Faculty: Alison Styring, Ph.D. and Amy Cook, Ph.D.

In the program Vertebrate Zoology, we explored the evolution, ecology, anatomy and physiology of vertebrates. Learning goals for the program included: develop a detailed understanding of the ecology, behavior, and evolutionary history and relationships among the vertebrates, develop a detailed understanding of functional morphology and ecomorphology, improve quantitative and communication skills, and improve skills in critical thinking, field methods and library research. Student learning occurred through labs, fieldwork and lectures. This work was supported by the following texts: *Wildlife Ecology, Conservation, and Management* by John M. Fryxell, Anthony R. E. Sinclair and Graeme Caughley and *Vertebrates: Comparative Anatomy, Function, and Evolution* ($8^{th}$ Edition) by Kenneth Kardong.

Lab and field activities provided students with the opportunity to develop a number of hands-on skills. In labs students worked with a variety of vertebrates in the form of fluid specimens, skeletons, a prepared skins. The focus of these labs was vertebrate taxonomy, evolutionary biology, and the relationship between morphology and ecology. Field exercises emphasized observation of vertebrate behavior, field identification of both vertebrate species and the main plant species that make up the communities in which they live, and techniques in field ecology, and maintaining a formal field journal. In exercises surveying squirrel middens, gathering data on gull demographics, and assessing snags as wildlife trees, students learned techniques in measuring forest characteristics, practiced sampling techniques, and gained skills in field identification.

Students developed and carried out a final research project over the course of the quarter. This project could be strictly literature-based or incorporate a field compoenent. The learning goals of the project included: clearly demonstrating a student's learning in vertebrate biology; demonstrate innovative learning through the development of a research idea and the synthesis of available ideas to address that idea; demonstrate information literacy by communicating, organizing and synthesizing information from primary literature sources to support learning; and practice and demonstrate a student's ability to develop novel questions/hypotheses and use what they have learned to answer/test them and analyze the patterns that they found.

**EVALUATION:**
Written by: Amy Cook, Ph.D. and Alison Styring, Ph.D.

Jordan took full advantage of the learning opportunities presented in the program and was a fully engaged member of the learning community. He attended class regularly, completed all assignments and earned full credit.

Over the course of the program Jordan developed a firm grasp of the central concepts of vertebrate biology presented in the program. His exams and assignments demonstrated a very good, detailed understanding of vertebrate evolutionary biology and anatomy and physiology. It was clear that Jordan had a deep understanding of the relationship between form and function in feeding and locomotion and the links between physiology and ecology for a variety of vertebrate groups. He was very comfortable with the ecological concepts presented in the program including trophic ecology, competition and island biogeography.

Elie, Jordan William — A00423588
Last, First Middle — Student ID

Jordan's work in the lab and the field showed strong integrative learning. In his journal assignments he made connections among concepts learned in class and his experiences in lab and the field and applied that information to novel and complex issues and challenges. Jordan has clearly gained a practical understanding of field methodology including the use of transects and plots to survey the nutritional landscape of vertebrates like deer and squirrels, the measurement of the characteristics of snags and their assessment as wildlife trees, and techniques for surveying vertebrates in the field to gain information about demography and population biology. His lab and field journals were well-organized with clear, detailed notes that demonstrated very good observational skills and thoughtful reflections on those observations. His annotated drawings clearly showed key elements of the specimens he observed in lab and demonstrated a very good grasp of vertebrate anatomy and functional morphology.

Jordan's final project focused on diving behavior of penguins in captivity. Jordan thoroughly reviewed the literature on the ecology of the African Penguin with a focus on diving and foraging and made observations of behavior in captivity through webcams at the California Academy of Sciences penguin exhibit. Jordan's understanding of behavioral research protocol was clearly evident in his description of the site and his data collection methodology including a detailed catalog of the behaviors he observed. The paper's Discussion made solid connections between wild behaviors discussed in the literature and what Jordan observed in the captive individuals. The project paper was very well written with a smooth narrative flow and confident, professional tone and demonstrated strong scientific writing skills. Jordan's 5-minute presentation on the research was clear and well organized with well-designed slides and showed a high degree of professionalism. It was clear from the project paper and presentation that Jordan has gained a deep understanding of both the key concepts and the methodology of behavioral ecology.

Over the course of this program Jordan has significantly expanded his view of the biology of vertebrates and his understanding of the core ideas and methodologies of the fields of anatomy and physiology, ecology, and behavior. His performance in the program reveals him as a critical thinker with a keen analytical mind and the ability to pull together ideas from a wide variety of sources. He is clearly prepared to do more advanced work in the field of vertebrate zoology.

**SUGGESTED COURSE EQUIVALENCIES (in quarter hours) TOTAL: 16**

*4 - Zoology: Vertebrate Diversity and Evolution
*6 - Zoology: Comparative Anatomy and Physiology
*4 - Vertebrate Ecology and Behavior
*2 - Final Project: Penguin Dive Behavior in Captivity

* indicates upper-division science credit

EVERGREEN

The Evergreen State College • Olympia, WA 98505 • www.evergreen.edu

# EVERGREEN TRANSCRIPT GUIDE

**Accreditation:** The Evergreen State College is fully accredited by the Northwest Commission on Colleges and Universities.

**Degrees Awarded:** The Evergreen State College awards the following degrees: Bachelor of Arts, Bachelor of Science, Master of Environmental Studies, Master of Public Administration and Master In Teaching. Degree awards are listed on the Record of Academic Achievement.

**Educational Philosophy:**

Our curriculum places high value on these modes of learning and teaching objectives:

- Interdisciplinary Learning
- Collaborative Learning
- Learning Across Significant Differences
- Personal Engagement
- Linking Theory with Practical Applications

Our expectations of Evergreen Graduates are that during their time at Evergreen they will:

- Articulate and assume responsibility for their own work
- Participate collaboratively and responsibly in our diverse society
- Communicate creatively and effectively
- Demonstrate integrative, independent, critical thinking
- Apply qualitative, quantitative and creative modes of inquiry appropriately to practical and theoretical problems across disciplines, and,
- As a culmination of their education, demonstrate depth, breadth and synthesis of learning and the ability to reflect on the personal and social significance of that learning.

Our students have the opportunity to participate in frequent, mutual evaluation of academic programs, faculty and students. In collaboration with faculty and advisors, students develop individual academic concentrations.

**Academic Program**

Modes of Learning: Evergreen's curriculum is primarily team-taught and interdisciplinary. Students may choose from among several modes of study:

- **Programs:** Faculty members from different disciplines work together with students on a unifying question or theme. Programs may be up to three quarters long.
- **Individual Learning Contract:** Working closely with a faculty member, a student may design a one-quarter-long, full-time or part-time research or creative project. The contract document outlines both the activities of the contract and the criteria for evaluation. Most students are at upper division standing.
- **Internship Learning Contract:** Internships provide opportunities for students to link theory and practice in areas related to their interests. These full- or part-time opportunities involve close supervision by a field supervisor and a faculty sponsor.
- **Courses:** Courses are 2-6 credit offerings centered on a specific theme or discipline.

The numerical and alpha characters listed as Course Reference Numbers designate modes of learning and are in a random order.

**Evaluation and Credit Award:**

Our transcript consists of narrative evaluations. Narrative evaluations tell a rich and detailed story of the multiple facets involved in a student's academic work. A close reading of the narratives and attention to the course equivalencies will provide extensive information about student's abilities and experiences. Students are not awarded credit for work considered not passing. Evergreen will not translate our narrative transcript into letter or numeric grades.

**Transcript Structure and Contents:** The Record of Academic Achievement summarizes credit awarded, expressed in quarter credit hours. Transcript materials are presented in inverse chronological order so that the most recent evaluation(s) appears first.

Credit is recorded by:

| | |
|---|---|
| **Quarter Credit Hours:** | Fall 1979 to present |
| **Evergreen Units:** | 1 Evergreen Unit (1971 through Summer 1973) equals 5 quarter credit hours |
| | 1 Evergreen Unit (Fall 1973 through Summer 1979) equals 4 quarter credit hours |

**Each academic entry in the transcript is accompanied by (unless noted otherwise):**

- The Program Description, Individual Contract or Internship Contract which explains learning objectives, activities and content of the program, course or contract.
- The Faculty Evaluation of Student Achievement provides information on specific work the student completed and about how well the student performed in the program or contract.
- The Student's Own Evaluation of Personal Achievement is a reflective document written by the student evaluating his or her learning experiences. Students are encouraged but not required to include these documents in their official transcript, unless specified by faculty.
- The Student's Summative Self Evaluation is an optional evaluation summarizing a student's education and may be included as a separate document or as a part of the student's final self- evaluation.

Transfer credit for Evergreen programs, courses and individual study should be awarded based upon a careful review of the transcript document including the course equivalencies which are designed to make it easier for others to clearly interpret our interdisciplinary curriculum. These course equivalencies can be found at the conclusion of each of the Faculty Evaluation of Student Achievement.

The college academic calendar consists of four-eleven week quarters. Refer to the college website (www.evergreen.edu) for specific dates.

This record is authentic and official when the Record of Academic Achievement page is marked and dated with the school seal.
All information contained herein is confidential and its release is governed by the Family Educational Rights and Privacy Act of 1974 as amended.
If, after a thorough review of this transcript, you still have questions, please contact Registration and Records: (360) 867-6180.