**Field Research Project**

The final project is designed to guide you through the process of conducting ecological research. The main goals of the project are to:

* Develop and revise a working hypothesis through detailed field observations
* Design and implement a field experiment to collect data and test that hypothesis
* Place your experiment into a larger theoretical context by evaluating your findings in light of existing peer-reviewed literature
* Preparing a scientific report

The final project will span the length of the course, and you will have four main tasks to complete and document as you move through the stages: blog posts, small assignments, annotated bibliography and final report.

Assessment Summary

|  |  |
| --- | --- |
| **Final Research Project** | **50% TOTAL** |
| Blog posts | 5% |
| Initial field data | 3% |
| Hypotheses/design | 3% |
| Sample annotation | 3% |
| Final field data | 3% |
| Data graph or table | 3% |
| Annotated bibliography | 10% |
| Final report | 20% |

Blog posts (5%)

To document your journey through your final project, you will use a weblog (blog). This space will allow you to post the different components of your study, and will allow you to comment on and share your ideas with your instructor and fellow learners in the course. You will create a series of blog posts documenting your efforts, including selecting and describing your study area, noticing interesting potential research subjects and patterns, formulating testable hypotheses and providing a theoretical context for your research.

For detailed instructions on how to create your first post go to the [course blog site](http://courses.olblogs.tru.ca/biol3021-sw3/) and click on the “Tutorials” tab.

You will have nine blog assignments in seven of the modules (see timeline below and each module for the details). Each blog entry is worth 5 points (except for the multi-part entry in Module 2, which is worth 10). Each entry will be evaluated using the following criteria.

**Blog post evaluation criteria**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **4-5 marks** | **2-3 marks** | **0-1 mark** |
| Completeness | Blog entries address all the components specified in the posting instructions. | Blog entries address some of the components specified in the posting instructions. | Blog entries address only a few of the components specified in the posting instructions. |
| Communication skills | Postings are clear, concise, and free of grammatical and mechanical errors and always use appropriate terminology and key concepts when discussing course topics. | Postings are usually clear, concise, and free of grammatical and mechanical errors and sometimes use scientific terminology when discussing course topics. | Postings are too short/long and/or unclear and hard to understand and seldom use scientific terminology when discussing course topics. |
| Critical thinking | Postings include exceptionally well-supported, thoughtful, and insightful comments. | Postings show some evidence of critical thought and self-reflection. | Postings show little or no evidence of critical thought and reflection. |

Double these marks for the multi-part blog post in Module 2.

Small Assignment Submissions (each worth 3%)

You will also have several small assignments related to your research project. These submissions will be evaluated and commented on. This will allow your Open Learning Faculty Member to assess your progress and give you feedback throughout the course of your research project. These submissions, each worth 3% of your final mark, include your initial field data, your research hypothesis and experimental design, an annotated bibliographic entry, your final field data, and a table or graph derived from your field data.

Each submission will be marked as 0, 1, 2, or 3 (which will correspond to the course percentage).

|  |  |  |
| --- | --- | --- |
| **Submission** | **Module** | **Percentage** |
| Initial field data | Module 3 | 3% |
| Hypotheses/design | Module 5 | 3% |
| Sample annotation | Module 7 | 3% |
| Final field data | Module 8 | 3% |
| Data graph or table | Module 9 | 3% |

**Submission evaluation criteria**

|  |  |  |  |
| --- | --- | --- | --- |
| **Criteria** | **3 marks** | **2 marks** | **0-1 mark** |
| Completeness | Submissions contain all the requested content. | Submissions contain some of the requested content. | Submissions contain little/none of the requested content. |
| Communication skills | Submissions are clear, concise, and free of grammatical and mechanical errors and always use appropriate terminology and key concepts when discussing course topics. | Submissions are usually clear, concise, and free of grammatical and mechanical errors and sometimes use scientific terminology when discussing course topics. | Submissions are too short/long and/or unclear and hard to understand and seldom use scientific terminology when discussing course topics. |

Annotated Bibliography (10%)

As part of your project you will create and submit an annotated bibliography of at least ten citations from the peer-reviewed literature, worth 10% of your final mark. An annotated bibliography is a list of bibliographic references with a description of the information that you found in the reference. The kind of information you include in the annotation will depend on your need and the purpose for compiling the bibliography.

Your annotations should be a fully integrated paragraph that summarizes the most important findings of the article and relates those findings to your research project. Specifically, you will need to describe the study organism, study area, research objectives, results and conclusions, and how the source is pertinent to your research. How was this source useful (or not) to your research. You can also critique the source: if any of the methods, results or conclusions seem biased or questionable, it is appropriate to voice this kind of evaluation in the annotation.

For an example of an annotation, information about citations, and referencing, go to the Module 7 tutorial “[Citation styles, reference managers and annotation](https://blearn.tru.ca/bbcswebdav/pid-282350-dt-content-rid-1208872_1/courses/DEV_OL_BIOL3021_SW_003/tutorials/unk_t06-tutorial_citation.html#unk_t06-tutorial_citation)”.

Annotated bibliography evaluation criteria

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| --- | --- | --- | --- | --- |
| **Criteria** | **Weight** | **High marks** | **Partial marks** | **Low marks** |
| Citation style | 10 | The citation style matches the required format exactly | The citation style largely matches the required format, but there are some deviations | The citation style is inconsistent and rarely follows the required format |
| Grammar and punctuation | 10 | Citations and annotations have proper grammar and punctuation | Citations and annotations have a few grammatical and/or punctuation mistakes | Citations and annotations have many grammatical and/or punctuation mistakes |
| Writing quality | 20 | Annotations are clear, concise, and well organized | Annotations are usually but not consistently clear, concise, and well organized | Annotations are unclear, too long or short, and hard to understand |
| Article summary | 30 | Annotations summarize key findings of articles and describe study organisms, areas, and objectives, results and conclusions | Annotations summarize key findings of articles but do not fully describe study organisms, areas, and objectives, results and conclusions | Annotations do not adequately summarize key findings of articles nor fully describe study organisms, areas, and objectives, results and conclusions |
| Article relevance | 30 | Annotations clearly describe how articles are relevant to student’s research | Annotations somewhat describe how articles are relevant to student’s research | Annotations do not adequately describe how articles are relevant to student’s research |

In addition to the above criteria, the student will need to have annotated at least 10 articles for full marks. They will lose 10% of their mark for every article less than the required 10. For example, if they submit eight articles, their maximum mark will be 80%.

Final Report (20%)

You will prepare a final report of your project, worth 20% of your final mark. Your blog posts, and other submissions, will help you complete this final report.

The final report is due after you complete Module 12. Scientific reports have a simple and consistent organization consisting usually of five parts: introduction, methods, results, discussion, and literature cited. The report on your field research project will follow this format and be between 10–15 double-spaced pages, not including figures, tables, or references. The papers you have read for the course and for your literature review will also provide you with examples of the type of information you will need to include.

For more details on how to prepare your final report, go to the Module 10 tutorial “[The structure of scientific reports](https://blearn.tru.ca/bbcswebdav/pid-282350-dt-content-rid-1208872_1/courses/DEV_OL_BIOL3021_SW_003/tutorials/unk_t01-tutorial_the_structure.html#unk_t01-tutorial_the_structure).”

**Final report evaluation criteria**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Weight** | **High marks** | **Partial marks** | **Low marks** |
| Introduction | (20) |  |  |  |
| Context/  background | 10 | Context for the study is clearly stated; study is a logical extension of existing research | Study given some context but it is not clear exactly how study relates | No or little context is given and there is little to no sense of how study relates to existing research |
| Importance | 3 | Importance of study clearly stated | Importance of study stated, but not clearly | Little sense of relevance of study |
| Goals | 4 | Goals of the study are clear and logical | Goals of the study stated, but somewhat unclear or imprecise | Goals are unclear, inconsistent or illogical |
| Hypothesis | 3 | Hypothesis and prediction clearly stated and related to background | Hypothesis and prediction somewhat unclear or imprecise | Hypothesis and prediction unclear, imprecise or illogical |
| Methods | (30) |  |  |  |
| Study area | 4 | Study area clearly described; details are relevant to the study organism and design | Study area somewhat clearly described but details not necessarily relevant to study | Study area poorly described with little relevant details |
| Variables | 4 | Response and predictor variables well-defined, clearly stated and techniques used to measure them clearly described | Response and predictor variables somewhat well-defined but some uncertainty in what information was collected or how it was measured | Response and predictor variables unclear; poor description of what information was collected or how it was measured |
| Sample design | 5 | Sample design clearly described and unambiguous; sample unit clearly defined | Sample design described with some ambiguity; sample unit description somewhat imprecise | Sample design poorly described; protocol and sample unit unclear |
| Analytical method | 2 | What type of analytical design (e.g., regression, ANOVA) the data fit into clearly described | Analytical design somewhat clearly described | Analytical design poorly described |
| Replication, randomization, independence | 5 | It is clear how samples were replicated, how randomization was incorporated into the study, and how independence was assessed | There is some uncertainty about how samples were replicated, how randomization was incorporated into the study, and how independence was assessed | How samples were replicated, how randomization was incorporated into the study, and how independence was assessed is poorly described |
| Results (text) | 10 | The results are clearly stated and supported by the data; no interpretation of the results is presented | The presentation of the results or their support by the data are somewhat unclear; results intermixed with some interpretation | Results poorly presented and unclear or their support from the data dubious; results and interpretation intermixed |
| Tables and Figures | (10) |  |  |  |
| Captions | 2 | Figure captions and/or table headings clear and able to stand on their own without reference to the body of the report | Figure captions and/or table headings somewhat clear but not able to stand on their own without reference to the body of the report | Figure captions and/or table headings unclear and poorly presented or organized |
| Labels | 2 | Figure axes and table columns are clearly labeled | Figure axes and table columns are somewhat clearly labeled | Figure axes and table columns are poorly labeled |
| Clarity | 4 | The body of the table or figure has a clear meaning and is well-organized | The meaning of the body of the table or figure is somewhat unclear and/or disorganized | The body of the table or figure is unclear and is poorly organized |
| Redundancy | 2 | Tables and figures are not redundant with each other or with the text of the results | There is some overlap in content between tables, figures, and the text of the results | There is considerable overlap in content between tables, figures, and the text of the results |
| Discussion | (20) |  |  |  |
| Hypothesis | 3 | It is clearly stated whether the hypothesis was supported or falsified | It is somewhat unclear whether the hypothesis was supported or falsified | There is no indication of whether the hypothesis was supported or falsified |
| Clarity | 6 | The interpretation of the results is clearly stated, logically presented, and directly related to the hypothesis | The interpretation of the results is somewhat clearly stated, logically presented, or directly related to the hypothesis | The interpretation of the results is unclear, illogical, or unrelated to the hypothesis |
| Context | 6 | The interpretation of the results is related to the background presented in the Introduction | The connection between the study results and the background is implied but not clearly made | The connection between the study results and the background is very unclear or poorly made |
| Importance | 5 | The importance of the study results is clearly stated | The importance of the study results is somewhat clearly stated | The importance of the study results is unclear or poorly stated |
| Bibliography | (6) |  |  |  |
| Within-text citations | 3 | In-text citations are consistently and properly formatted | In-text citations have some errors of style or punctuation | In-text citations are inconsistently or incorrectly formatted |
| Bibliography | 3 | The bibliography is consistently and properly formatted | The bibliography has some errors of style or punctuation | The bibliography is inconsistently or incorrectly formatted |
| Writing quality | (14) |  |  |  |
| Clarity | 10 | The writing is clear, articulate, well-organized, and logical throughout | The writing lacks clarity and organization is places or has inconsistencies in style | The writing is unclear and lacking in organization, logical presentation or style |
| Spelling, punctuation, grammar | 4 | There are very few to no errors of spelling, punctuation, or grammar | There a few errors of spelling, punctuation, or grammar | There are many errors of errors of spelling, punctuation, or grammar |

Final Project Timeline

|  |  |  |  |
| --- | --- | --- | --- |
| **Module** | **Blog Posts** | **Assignment Submissions** | **Final Components (Annotated Bibliography/Final Report)** |
| 1. Course Introduction | Select and describe study area, evaluate information sources |  |  |
| 2. Ecology as a Science | Select research subject/pattern to study, formulate initial hypothesis |  |  |
| 3. Environmental Factors | Collect initial field data, discuss virtual sampling tutorial | Initial field data |  |
| 4. Ecological Energetics | Reflect on feasibility of initial hypothesis and sampling strategy, evaluate other student’s hypotheses |  |  |
| 5. Disturbance & Succession | Revise (if necessary) initial hypothesis, develop experimental/sampling design | Research hypothesis/prediction, experimental/sampling design |  |
| 6. Biomes & Ecozones | Conduct field sampling and describe progress |  |  |
| 7. Community Structure | Field sampling, literature review, theoretical context for research | One annotated bibliography entry |  |
| 8. Species Interactions I | Field sampling, literature review | Field data |  |
| 9. Species Interactions II | Literature review, final report | One graph or table generated from field data |  |
| 10. Biodiversity |  |  | Work on Final Report and Annotated Bibliography |
| 11. Landscape Ecology |  |  | Work on Final Report and Annotated Bibliography |
| 12. Conservation |  |  | Final Report and Annotated Bibliography due |