Assignments and Rubric for the Module and Capstone

## Day 1: Team Contract Assignment (Group Assignment)

**Directions:**

1. Create a Team Contract that lists these agreements and expectations of your team's norms and standards to be counted as a contributing member.
2. After jotting down notes on the Whiteboard in class, enter information into a language model AI like ChatGPT, Grammarly, or similar and request the team contract be edited for organization, tone, and grammar.
3. Review the output and make final adjustments for clarity and voice.
4. Post the final document + any intermediate drafts/notes/AI prompts used to create it to receive full credit.
5. Denote all contributing authors (bracketed initials beside major statements/paragraphs is recommended).

**Goals:**

* To start an honest conversation with your teammates.
* To practice identifying team needs, strengths, and boundaries.
* To establish team norms and accountability.
* To provide guidance in discussing team dynamics that need to be improved or adjusted as the semester continues.

**What this Document Needs to Contain:**

Articulate clear and actionable agreements regarding team member expectations in the following aspects:

1. Work contribution quantity/quality
2. Communication methods and response times
3. Project lead times and internal deadlines
4. How you will track contributions and accord credit for work contributed
5. How you will express grievances and address disputes.

## Day 2: Laying the Groundwork (individual assignment)

**Purpose**

In research, we build a base of knowledge and background information so that we better understand what is already known and can identify the gaps in what we as a community understand. We want to avoid reinventing the wheel, we want to inform ourselves in order to make more meaningful questions, and we want to keep up with the techniques and approaches that have been used and are being developed in the field to help us design solid experiments.

**Goal and Objectives**

* To refresh skills (hopefully!) learned in BIOL 1107 in using science databases to find peer-reviewed literature pieces.
* To build skills in being able to read and understand scientific literature and create a summary of meaningful/relevant points from those resources.
* To identify works that will help you and your team construct a research question surveying a small population of museum specimens.
* To build a small team or class-wide database of works to share for this first module’s development.

**Directions**

1. Using databases that cater to peer-reviewed literature (Google Scholar (with peer-reviewed filter checked), Science Direct, Web of Science, Entrez Pub Med to list a few!), find a paper on coyote morphology or coyote ecology of the Chihuahuan desert.

2. Create a document (Word, Docs) and enter the list of the search terms you used for each iteration of searching you performed. Your terms should become more specific as you narrow in on a topic! (1 point)

3. Generate a citation for the paper you select and add it to the document. Be sure you can access the full PDF for free through UTEP Library login or by finding open source articles! (1 point)

4. Read the paper and create list of rough notes and highlights, being sure to describe how this information could be used in the study! Add these notes in rough form to the document. (5 points)

5. Pass your rough notes through ChatGPT to edit for organization, clarity, and voice appropriate for a college-level annotated bibliography and copy the citation and output into your document after inserting a page break. You should have your final reference and annotation on its own page for this activity. (2 points)

6. Upload both your annotation document and a PDF copy (1point) of the article you annotated to Blackboard.

**Reminders:**

* If you need a refresher on how to create an annotated bibliography (150-200-ish words for the annotation itself), how to cite in APA format, or how to distinguish between primary and secondary sources in the literature, please refer to the support materials in your Module 1 folder or reach out to your TA. Don't copy the article abstract or insert quote after quote from the source materials. Your mission is to extract useful information and share it with your classmates in your own delightful words!
* Review the ChatGPT (Grammarly or similar LLM for writing) output to ensure things are stated without introducing overstatement or inaccuracies!

## Day 2: Extra Credit (reading and annotating a review paper)

**Goal**

* To practice reading another form of scientific literature, the scientific review (or secondary literature).
* To gain a greater appreciation of just one of the many impacts soil microbiota and microfauna have on the greater ecosystem--in this case, human health.
* To gain deeper background understanding relevant to the first project of this semester.

**Directions**

Read the review article provided above and create a document where you provide responses to the question prompts (listed below) as a rough draft. (5 points)

**Prompts**

(Do not quote the article. Provide your own answers in full sentences.)

Please note, there will be multiple major concepts described (generally a major concept per section of the article). Make sure to address **each** major topic sections in the review as you respond to the prompts.

1. Explain each of the main concepts presented in this review article and contextualize them in terms of how it relates to the first class research project. (5 points)

2. What are the types of research being presented in each section (i.e. are they surveys, observations, correlations, molecular or metabolic studies, behavioral studies, medical scans, etc.). How might you use each of these approaches to extend on information you could gain through museum specimen measurements? (5 points)

## Day 3: Constructing your research proposal (Group Assignment)

**Purpose:**

Before embarking on research, it is essential to establish a framework that provides your intent, your governing rationale as to why this line of investigation is important (scientific contribution), your expected outcomes and rationale as to why you think this is what you will observe, your plan for testing your hypothesis/addressing your research question, and your approach to analyzing that data. To practice these skills in preparation for upper-division work in biology, in research, or just to gain a greater appreciation for the processes governing science research, follow the directions below.

**Directions:**

1. Create a document shared among the team. With revision history active, each team member should provide contributions on at least one of the following sections to receive credit for the assignment:

 a. The research question and rationale behind why you are interested in investigating this.

 i. Rationale should draw upon the resources you looked up for the annotated bibliography

 ii. In-text citation should be used to indicate which references were used. A parenthetical list at the end of a sentence containing information derived from a reference or synthesized from multiple references should be used.

 b. The hypothesis and expected outcomes should be stated.

 i. Ensure that your hypothesis is testable using the available tools and samples in the lab.

 ii. Make certain that your expected outcomes are justified based on resources read. If necessary, send scouts to other tables to ask about sharing their own references to your team's pool.

2. In class, be prepared to present your research question and hypothesis as a quick statement (3-5 sentences max) to discuss in class.

**After In-Class Feedback:**

3. Refine your RQ and hypothesis after the class discussion in your original document and add

 a. Your experimental design

 b. Groups you are examining or comparing (and your sample size for each group!)

 c. Traits you will be measuring and why those traits are of interest or expect to yield data addressing your research goals

 d. Quality assurances (replication or repetition)

 e. Type of statistical analysis you will perform how this analysis will test your hypothesis

4. Review this document and pass it through ChatGPT to be edited for clarity, organization, and voice for a research proposal at the college level. Attach this output to your document after a page break.

5. With Track Changes active, members must review and comments on changes that should be made (or make changes to the draft directly) to correct inaccuracies, misrepresentations, overstatements, or other bits of odd or overly florid/ jargony language.

**Extra Credit: (5 points)**

Create a diagram that provides a graphical summary of your research design. Creating these "graphical abstracts" are becoming increasingly prevalent in professional publications and are commonly used in posters and talks as a way to keep readers and audience members well-oriented in the research activities! Be sure to include a figure caption that provides an explanation for symbols and colors or abbreviations used to code information. Include a very brief walkthrough set of statements in that figure caption. Include in-text figure referrals to point readers to your figure and embed the figure in your final draft.

## Day 4/5: Preparing your Materials for Lab Meeting (Group Assignment)

**Presentation Rubric**

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| --- | --- | --- |
| Criteria | Satisfactory | Unsatisfactory |
| Framing the research project | Clearly stated research question or objectives. Demonstration of the significance or relevance of the research. Sufficient background information provided to understand the project. | Vague or unclear research question or objectives. Inadequate explanation of the significance or relevance of the research. Lack of background information or context |
| Presenting and narrating visual data | Clear and appropriately labeled data image figure. Data figure effectively represents the research findings. Appropriate choice of visual display (e.g., graphs, tables, charts). | No data image figure presented. Data figure lacks clarity or is poorly labeled. Insufficient data representation or inappropriate choice of visual display. |
| Putting findings into context | Clear explanation of the implications or connections of the results. Comparison of the findings with existing literature or previous studies. Ability to interpret the findings in a broader context. | Failure to explain the implications or connections of the results. Lack of comparison with existing literature or previous studies. Inability to interpret the findings in a broader context. |
| Determining project weaknesses or limitations | Thorough acknowledgment and identification of project weaknesses or limitations. Thoughtful assessment of project weaknesses with supporting evidence. Recognition of potential sources of error or bias and their impact on the results. | No acknowledgment or identification of project weaknesses or limitations. Superficial or incomplete assessment of project weaknesses. Inability to recognize potential sources of error or bias. |
| Suggesting future improvements | Clear and relevant suggestions for future improvements. Thoughtful consideration of potential modifications or further investigations. Logical and feasible proposals for improving the research project. | No suggestions for future improvements provided. Superficial or unrealistic suggestions. Inability to propose logical and relevant improvements. |

**Purpose**

Lab meetings are part of research culture. Different labs will have different approaches to their meetings based on culture established by the PI (Principle Investigator: person who leads the research lab). However, there are some common purposes to lab meetings:

1. It's a less formal space than a professional presentation or conference where research assistants (RAs) can share their data findings while their research is still in-progress
2. It's a way of enabling not only the PI but the other RAs to know and understand the progress happening on all research projects
3. It's a way for an RA to get feedback from different perspectives and to get ideas on how they can better their research
4. It's a way to identify potential flaws or pitfalls in the experimental design, data analysis, or interpretation before the research is shared with the broader scientific or public community.

**Directions**

1. Consult the rubric associated with this assignment (panel on the right) to gain perspective on expectations. Note, if elements are completely missing, no points will be earned for that portion.
2. Create a set of slides (Google Slides or Power Point) making use of the data figure you prepared in the last lab, and the resources you constructed in preparation for your research project.
3. Include an end slide for your references and acknowledgement of contributions made to the project by various team members.
4. Upload this file to Blackboard.
5. Team members should review the project together to ensure each member understands the project well and can talk conversationally about their project and their data. One member will be selected at random to speak for the team. Other team members may contribute, clarify, or respond during post- share-out questions and discussion.