# PEP 2022 Class Skills Rubric

The table below shows the skills and content we are going to work on in this class. The skills are organized by sub-project. You should review each row and ask questions so that you understand what I am asking of you in each section. Then:

**TASK 1:** For each row, you should put a "tick" in the box where you feel confident given your previous experiences. I have given you a L0 box if you have little or no experience with a certain skill. I'm expecting there to be a good number of you who tick a lot of L0 and L1 - that is fine, this is just an honest assessment, not a competition.

**TASK 2:** After you have made a self assessment, I want you all to decide on some goals. In each row you should circle a level that you plan to attain. This will mean growing some (but not necessarily all) of your skills from your self-assessed level to a higher level. This will look different for each of you, but as a general guide for what I think is manageable in the time we have:
- If you mainly ticked L0 and L1, your goal should be to bring all your skills up to L2 so just circle all the L2 goals.
- If you mainly ticked L1 and L2, you should pick about 2 skills to move to L3 (circle these) and then circle all the other L2s.
- If you feel like you are mostly ticking L2, then you should pick about 4 skills to focus your energy on moving to L3. Circle these four goals and then all the other L2s
- If you happen to feel like you are mostly choosing L3 then we can discuss your experience and make a plan to help you move skills forward regardless.

**TASK 3:** From this self-assessment I will review and we will sign a grading contract that will look different for everyone but will have the same general gist: We will agree on a set of goals for you to accomplish in the class - if you fulfill them all then you get an A, partial fulfillment is a B. Showing me that you can do the things you said you could without showing growth is a C. We will review this contract mid-class to determine if the goals are still reasonable or if you were too ambitious or not ambitious enough.

| | L0 | L1 | L2 | L3 |
|---|---|---|---|---|
| **Background presentation** | | | | |
| Oceanography Background knowledge | | Can describe basic patterns of physical, chemical and biological properties of the ocean including stratification, phytoplankton, zooplankton, carbon pump, ocean acidification, and nutrient availability | Can apply this understanding to describe real-world ocean data such as CTD casts, water samples, and other in-situ measurements. Can relate concepts to important environmental issues. | Can predict the interplay of properties and how they change seasonally. Can describe observed and predicted regional and global climate changes. |
| Literature Search | | Can interpret the basic structure of a research paper. Can search and find relevant papers on a topic. | Can extract key information from a number of papers and combine in a properly formatted annotated bibliography. | Can analyze the papers gathered to determine which are most relevant to their research topic. Can combine to form a mind map and extract what is, and what isn't, known. |
| Presentation | | Can describe the basic elements of a scientific presentation. Can organize ideas on slides with bullet points | Can organize presentations from large context to specific details and plan. Can reduce reliance on on-screen bullets, use relevant imagery and deliver from notes if needed. | Can build a talk that makes a clear case for the importance of the topic, what is known, and what is still unknown. Motivation for study should be clear. Can create appealing, custom slides and present engagingly without notes. |

| Data Report | | | | |
|---|---|---|---|---|
| **Data Report** | | | | |
| Visualization | | Can describe the need for visualization in science and the pros and cons of coding. Can describe a variety of plot types and their uses | Can read in data to R and make a simple x-y plot. Can propose relevant plots from cruise data and make at least one. | Can make multiple cruise plots and add complexity by plotting numerous data on the same figure using colors or shapes. Can analyze and revise plots for clarity. |
| Hypothesis testing | | Can describe what a hypothesis is and some oceanographic considerations for testing one | Can state at least one revelevent hypothesis for project and test using a data visualization. Can make case for why hypothesis has been confirmed or refuted. | Can incorporate literature review to focus attention on hypotheses that are less well understood and may require multiple plots to prove. |
| Writing report | | Can describe plots and noticeable features | Can relate patterns observed to relevant background literature and hypotheses generated. | Can describe nuances/anomalies in data in the context of expectations and discuss both the potential quality of the data and other factors that influence values recorded |
| **Poster** | | | | |
| Data Design | | Can describe some key design considerations for figures and suggest improvements to existing figures | Can edit a plot in R for design elements such as scales, labels, and themes | Can add a combination of these design elements to a plot and review multiple trials to determine the best outcome |
| Composing text | | Can summarize background info and data report outcomes in key bullet points | Can create synthesized, short text under appropriate headings suitable for a scientific poster | Can develop a story for the poster under custom headings and incorporate draft edits into text |
| Poster | | Can describe best practices in design as relates to creating a research poster | Can draft a scientific poster with clear sections, well placed graphics, and appropriate font sizes | Can incorporate more sophisticated design elements such as feature images, using layout tools, color scheming, borders, uniformity of margins, photo cropping, etc. Can take feedback and revise. |
| **Reflections** | | | | |
| Self-reflection | | Can understand some basic elements of self reflection | Can reflect on what they are learning and how it is shaping their goals and identity at a few occasions during the class. | Can keep a regular journal of what their experiences, what they are learning and what it means for them. Can use these reflections to create and revise a career plan. |
| Teamwork | | Can describe features of successful teams, the importance and mechanics of collaboration in science, and some ethical considerations in research. | Can work in a team by discussing individuals' strengths and weaknesses and dividing responsibilities equitably through the use of a teamwork contract | Can revise a teamwork contract mid-way through project and reflect in-depth on their role in the team and what they would change for next time |
| Wider community | | Can describe some findings and question in a variety of ocean and environmental science disciplines | Can reflect on the connection between their interests and the work of other disciplines in ocean and environmental sciences | Can analyze and map a variety of research topics within a field and create possible interconnected projects that would build bridges between disciplines |

Any Comments?