Syllabus Outline: Reading & Research Experience Course

Dean F. Hougen

Introduction

This document provides an outline for a course intended to provide you with a combination of reading and research experience. This is only an outline; you will need to complete it with details for your own course, including everything from the topic to the particular book chapters and/or research articles you will read. Moreover, you should customize this general outline to suite your particular needs.

This particular outline provides a mix of reading and research, with the emphasis on the research. (It shows four weeks of reading and twelve weeks of research.) For courses that are intended to emphasize reading, there should be more weeks of reading combined with more demonstrations of understanding of individual sources (e.g., more chapter and/or article summaries, presentations on these sources), more in-depth demonstrations of understanding of these individual sources (e.g., critical evaluations of these sources in addition to summaries), and more demonstrations of integration of understanding of knowledge sources (e.g., substantial comparisons of sources). If the course is entirely focused on reading, a literature survey paper is an appropriate final product, rather than an original research paper. If the course is entirely focused on research (perhaps you have already learned about the field through an associate readings course), the readings at the start of the semester should be reduced or eliminated to allow for more experimental work (e.g., formulating multiple hypotheses, designing and conducting multiple experiments). In any case, the final submitted paper will be a substantial piece of work, suitable for conference publication.

Use this introductory section to explain which type of course you are hoping to have and why.

Topic

Your topic must mesh with my research interests. The general topic must be artificial intelligence (AI). Within that topic, I am primarily interested in having students study machine learning and/or robotics but I will entertain proposals in other areas of AI if you can make a compelling case—one that demonstrates your existing knowledge of the area and sparks my interest.

Write a paragraph describing, *in your own words*, the topic you have selected. (If you are unclear as to what it means to described something "in your own words," please read the University's web pages on academic integrity, https://integrity.ou.edu, particularly the documents related to plagiarism.) The point of your writing this paragraph is to ensure that you have looked at your proposed topic in enough depth to make a topic selection appropriate for a course.

Your topic paragraph should be approximately 100-200 words in length. (This is a guideline range. Values somewhat outside this range are acceptable.)

Sources of Knowledge

In this example document, two general sources of knowledge (chapters from one or two recent textbooks and/or one or two recent survey or tutorial articles from the primary, peer-reviewed literature of the field) are used, as are two specific sources of knowledge (original research papers from the primary, peer-reviewed literature of the field). A readings-focused course should have far more sources

of knowledge (perhaps up to four general sources and a dozen or more specific sources of knowledge). A research-only course could omit these sources but should only be undertaken if appropriate knowledge of the field is established otherwise (e.g., in an associate readings course).

Explain here which sources of knowledge you will use, including complete citations for them, and a give a justification for the selection of each.

Methods of Demonstrating Understanding

Because this sample course is primarily focused on research but also has a reading component, the methods of understanding are focused on the application of existing knowledge to conduct research and develop new knowledge—developing a research question and corresponding hypothesis, designing an experiment to test that hypothesis, adapting existing code to carry out the experiment, conducting the experiment and collecting data, analyzing the data to determine what it means, discussing those results and drawing conclusions, then proposing related future work.

Of course, this presumes a basis in existing knowledge on which to base the research. It therefore begins with a few readings. Understanding of these individual sources of knowledge is demonstrated through summaries of them and integration of understanding is demonstrated by writing the introductory section of the final paper, which synthesizes this information into a coherent introduction to the topic and previous research related to that topic.

While this course uses summaries of individual sources of knowledge to demonstrate understanding of them, other methods of demonstration, such as presentations, are also possible.

Similarly, while this course uses the introductory section of the final paper to demonstrate integration of sources of knowledge, in a readings course a literature survey would be appropriate to show integration.

Grading

This sample course presumes that the research conducted is based closely on prior research and therefore requires only small modifications to existing software to conduct the research. If it is anticipated that you will be developing substantial software (perhaps in a research-only course), that aspect of the course should receive a substantially larger portion of the grade.

Briefly justify the percentages assigned to each component.

- Summaries: 20% total (5% each)
- Paper: 65% total
  - Intro: 5%
  - Hypothesis: 5%
  - Experimental Setup: 10%
  - Results: 10%
  - Discussion: 10%
  - Conclusions: 5%
  - Future Work: 5%
- Presentation: 5%
- Code: 10%

Schedule

Week	Activity	Submit
1	Read and summarize textbook chapter or survey/tutorial article	Summary
2	Read and summarize textbook chapter or survey/tutorial article	Summary
3	Read and summarize original research article	Summary
4	Read and summarize original research article	Summary
5	Pose research question and formulate hypothesis	Research question, hypothesis
6	Write draft of introduction and hypothesis sections of paper	Draft sections
7	Design experiment to test hypothesis	Notes on experimental design
8	Write draft of experimental setup section of paper	Draft section
9	Adapt existing code to conduct experiment	Modified code
10	Run experiment code and collect data	Data
11	Process and analyze data	Notes on analysis
12	Write draft of results and discussion sections of paper	Draft sections
13	Write draft of conclusions and future work sections of paper	Draft of complete paper
14	Create draft presentation of research	Draft presentation
15	Present research	Final presentation
16	Revise and submit final paper	Final complete paper