

Physics 332, Spring 2022

Final Project

The final project in this class is to explore a more advanced topic in statistical mechanics in depth. You will do so by reading and then presenting a piece of recent literature. There are suggested papers in a folder on canvas, but I am highly supportive of you choosing your own paper to summarize. The only constraint is that you can explain to me how the paper is connected to statistical mechanics.

You will demonstrate your understanding of the paper by communicating its main results, both in a brief presentation and in a written summary. You are not expected to understand every single aspect of the paper you chose, but I do expect for you to work to understand the general story, and the connection to statistical mechanics. This is an expansive task, and so I have broken it down into pieces; there will be a small portion of the final project due every week for the remainder of the course. Below are the due dates for each piece of the project; the expectations for each portion of the assignment will be expanded upon as the class progresses.

Assignment	Due date
select paper	Friday 4/22
identify key stat mech concepts in paper	Friday 4/29
identify additional literature for review	Friday 5/6
one paragraph summary of paper	Friday 5/13
brief outline: intro (connection to background), identify 3 key points, summary	Friday 5/20
1 slide summary presented to class	in discussion 5/23
brief recorded presentation (5 minutes)	emailed by 6/3
final write-up (2-3 pages, at least one figure)	emailed by 1pm 6/10

Project component details:

1. **select paper [5 points]:** Chose a paper which to review.
2. **identify key statistical mechanics concepts [10 points]:** Identify what piece of statistical physics this paper is exploring (there may be several key concepts).
3. **identify additional literature for review [10 points]** Papers do not stand alone, and it is unlikely you will have sufficient background to fully explore all of the concepts presented in the paper you chose. You should identify at least three (likely more) additional sources to support your presentation of the results of your paper.
4. **one paragraph summary of paper [10 points]:** You should begin with 2-3 sentences of background/introduction, then summarize the main result of your paper, the statistical mechanics concept presented, and then end with a conclusion.
5. **brief outline [15 points]:** This the expanded version of your one paragraph summary, and it should be written in outline form. The outline should have three sections: introduction (connection to background), 3 key points (results summary and connection to statistical mechanics), conclusion (putting it all together, future outlook).
6. **1 slide summary [20 points]:** This is essentially your one paragraph summary in slide form. This assignment has two purposes: (1) to give you practice presenting science and (2) to share what you have doing with the class so we all learn a little bit about these advanced topics. Prof. Driscoll will provide more instructions on scientific presentation as the class progresses.
7. **brief recorded presentation [35 points]:** This is your outline in the form of a presentation; you will record a five minute presentation and send it to Prof. Driscoll. Details on the expectations for this presentation will be provided at least two weeks in advance.
8. **final write-up [45 points]:** You will turn in a 2-3 page summary of the paper you explored; it should contain at least one figure, but more figures are welcome. You should cite relevant literature, and your audience for this assignment is not Prof. Driscoll, but one of your fellow students. Prof. Driscoll will provide more detailed instructions at least two weeks in advance.