



Name:	
Student ID:	

Midterm & Final Examinations

Phys777: Bootstrap Methods in Physics I

Oral-Midterm — 2024/11/28
Discussion-Final — 2025/01/02

- Students will choose a topic from the list available at the end of this document. They will give a 15 minutes talk based on it, which will count as their midterm exam. They will also prepare a review article for that topic, which they will discuss with the instructor: this will count as their final exam.
- Each exam will be out of 50 points and will be conducted in the room P432 on the specified day (Nov28 for midterm, Jan02 for final); further details of the exams are available in this document: please read it completely.

MORE ON TIME OF EXAMS

- There will not be class on the exam days; instead, students will have their exam at P432 in the time slot assigned to them based on their ID numbers:

Morning Session

23722252	2372100	2422814	1941459	2069060	2423010	2423143	255357
10:00-10:15	10:20-10:35	10:40-10:55	11:00-11:15	11:20-10:35	11:40-10:55	12:00-12:15	12:20-12:35

Afternoon Session

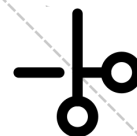
2496453	2496420	2212678	2033611	2496313	2496172	2555100	2608453
14:20-14:35	14:40-14:55	15:00-15:15	15:20-15:35	15:40-15:55	16:00-16:15	16:20-16:35	16:40-16:55

- The time slots are distributed based on the course schedule of each student in METU-SIS, so you should not have any academic conflict in principle. Nevertheless, students are allowed to change their slots among each other provided they inform the instructor beforehand.
- Since the schedule is quite tight, there is no room for reschedule if the student misses their appointment. You are allowed a make-up if you have a medical report (for further details, see <https://soneralbayrak.com/teaching/MyTeachingPolicy>)

MORE ON MIDTERM

- Student will make a presentation to the instructor about a topic that will be predetermined. S/he can use blackboard or use slides which should be prepared in a PDF format and be sent to the instructor at least a day before the presentation.
- The presentation is strictly ≤ 15 minutes (as required by the tight schedule). Once time is up, the instructor will interrupt the talk.

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MORE ON FINAL

- Student will prepare a review article about their topic, and send it to the instructor before 2024/12/26. The article should be prepared in $\text{\LaTeX}$ and in the format of one of the major publishers (such as *Review of Modern Physics*, see <https://journals.aps.org/rmp/authors>; or *Physical Review Letters*, see <https://journals.aps.org/prl/authors>).
- There is no lower length limit on the size of the document: even a single-page review is fine if you believe it is fit for the topic at hand. However, there is an upper limit on the length of the document, 3750 words, which is the same standard with a PRL submission.

MIDTERM GRADING RUBRIC

Question: 1 (10 points)

The opening was good: it was suitable for a broad audience, included a hook to receive attention, summarized the talk well, contained sufficient motivation as to why we should be interested, etc.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 2 (10 points)

The talk was professional: the speaker seemed confident and sufficiently knowledgeable about their talk; they spoke at a pace easy to follow; they handled questions well, and so on.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 3 (10 points)

The talk had a conclusion/summary part that wrapped up all important points; it included a quick discussion of the current literature and the open directions in the field; and so on.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 4 (10 points)

The talk was prepared in a manner to be appropriate for 15 minutes, and the speaker delivered it so that it was neither over too early nor was it unfinished by the end of the time.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 5 (10 points)

The student did not simply memorize things but actually understood the content and its physical importance.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

FINAL GRADING RUBRIC

Question: 1 (10 points)

The review article was prepared in an appropriate format (including the margins, citations, etc.) and was suitable in its current form to be submitted to an actual journal.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10



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Question: 2 (10 points)

The review article was written with a good English and it contained various elements (tables, figures, images, etc.) to make its case. Furthermore it was free of linguistic or semantic mistakes/typos/errors.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 3 (10 points)

The article covers the relevant literature well and summarizes the field neatly.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 4 (10 points)

Student had a good command of their article and was able to explain it fully to the instructor during their meeting.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

Question: 5 (10 points)

Student did not simply memorize the article but actually understood the content and its physical importance.

☐ 0 ☐ 2 ☐ 4 ☐ 6 ☐ 8 ☐ 10

POSSIBLE TOPICS

Below is a list of possible topics that can be chosen for the exams. Note that **(1)** students should choose a single topic to be used for both the midterm and the final, and **(2)** students can choose a subtopic of those listed below or a topic which is not present here as long as it is somewhat related to the current approaches in the modern literature (and they should check if their topic is appropriate with the instructor before proceeding).

- **Symmetries in QFT**, for instance [https://doi.org/10.1016/0370-2693\(80\)90212-9](https://doi.org/10.1016/0370-2693(80)90212-9) and <https://inspirehep.net/literature/796886>
- **General Conformal Field Theories**, for instance arXiv:hep-th/9810192, arXiv:0803.1467, arXiv:0807.0004, arXiv:1105.4598, arXiv:1107.3987, and arXiv:1112.1016.
- **2D CFTs**, for instance [https://doi.org/10.1016/0550-3213\(84\)90052-X](https://doi.org/10.1016/0550-3213(84)90052-X), [https://doi.org/10.1016/0550-3213\(88\)90179-4](https://doi.org/10.1016/0550-3213(88)90179-4), [https://doi.org/10.1016/0550-3213\(86\)90552-3](https://doi.org/10.1016/0550-3213(86)90552-3)
- **AdS/CFT Theory**, for instance arXiv:hep-th/9803131, arXiv:hep-th/9903196, arXiv:hep-th/0112258, arXiv:hep-th/0210114, arXiv:hep-th/0605073, arXiv:0907.0151.
- **Warped Extra Dimensions**, for instance arXiv:hep-ph/9905221, arXiv:hep-ph/9907447, arXiv:hep-ph/0003129, arXiv:hep-ph/0308036.
- **Other AdS/CFT Applications**, for instance arXiv:hep-ph/0602229, arXiv:0803.3295, arXiv:0804.4053, arXiv:0804.3972.
- **CFTs at Colliders**, for instance arXiv:hep-ph/0703260, arXiv:0708.1463, arXiv:0801.1140.
- **Superconformal Theories**, for instance arXiv:hep-th/9411149, arXiv:hep-th/9407087, arXiv:hep-th/9712074, arXiv:hep-th/0304128