

MENA5010/9010 Nanophysics

Department of Physics, UiO

Guide to oral exam and grading system

The grade in the **oral exam** in MENA5010/9010 is part of the grade that is given to a student who finalizes the course. The oral exam grade constitutes 60% of the total grade. 40% of the total grade is allocated to compulsory presentation of a nanophysics topic. The length of this presentation is one academic hour. Its topic is advised by lecturer or chosen by the student in agreement with the lecturer. The grade for the oral exam is given as percent of 'ideal' performance described below and is agreed between the lecturer and external examiner directly after the examination. The total grade can be offset by active participation of the student in the work of the group. 10% of the total grade can be given for solving and explaining to other students problems from the main textbook: Thomas Heinzel 'Mesoscopic Electronics in Solid State Nanostructures', 3rd edition, Wiley-VCH, 2010 or an alternative book on the topic in agreement with the lecturer. To get these 10%, two problems should be solved by MENA5010 students and three problems by MENA9010 students.

Another 10% can be given for organizing for the whole group a visit to a nano-science laboratory. In the previous years, these laboratory visits with the demonstration of relevant experimental equipment were very popular among the students. Additional 5% student can get for short (2-3 slides) presentation of a nano-topic demonstrating her/his specific interest in the nanophysics. These presentations are given in the beginning of the course. They are of particular importance, as the content of the following lectures could be adjusted according to the interests of the students.

In such a grading system, if, for example, student gets maximum possible 25% of the grade from the activity in the group, then the rest 75% is shared on the above-mentioned basis 60%-40% between the oral exam and the compulsory presentation. The compulsory presentation is graded by the lecturer and external examiner, who will be provided with a pdf copy of the presentation. As a guidance, presentations are also graded by other students. The goal of this is to make presentations interesting to the whole group. The grading system as whole is designed to promote *Active Student Learning*.

At the oral exam, only the student, the lecturer and the external sensor are present. In answering the questions, the student (candidate) can choose whether to write on paper or on board. It is often easiest to use a board. It is allocated approximately 45 minutes for each student. It is allowed to bring notes or other items relevant to the preparation of the first question, which student gets from a known list, available on net, by blind choice 2 hours before the exam. The answer to this question constitutes 50% of the **oral exam grade**. Student covers this question in active dialog with examiners during about 20 minutes. Other 50% of the exam grade are shared between 3 questions for MENA9010 students and 2 questions for MENA5010 students during 20-25 minutes. The latter questions are selected from the list available on the website of the course and chosen by the examiners to not cover the subject of the first question. These questions are answered without preparation. Most of the questions are discussed during the lectures and practicals and displayed in the lecture files. The number of questions is large, assuming student's work with the textbook and lecture slides outside the lecture hours. Students have right to remove in a collective discussion about 25% of the questions before the exam if they are not covered in full or not relevant to the current activity of the most of the students.

On the oral exam, it is the professor (lecturer) who leads the examination in a positive and encouraging way. The first question, which student prepares for two hours, is of a general character, which embraces one large, important topic of the course. The following questions are more specific and require detailed knowledge of the other topics. Typically, examiners start with simpler detailed questions followed by more difficult ones, until it is understood how deep and wide the obtained knowledge is. It is common to ask complimentary, simpler questions during the examination when it is noticed that the knowledge is not clear. The questions are adjusted in a way, in which not much time is spent on details if the student is not performing well.

In principle, it is possible that an exam ends up in such a way that the candidate gives some answers to most of the questions without being addressed negatively - and still could get low grading. If the answers given by student indicate that the knowledge is low and even wrong, examiners may not confront her/him along the way to avoid extra nervousness and uncertainty. However, this happens very rarely in the course. As a rule, the students who attend lectures and work in the group are performing well on exam. Nevertheless, because the course is not simple, the **top grade A** as the summary of all grades is rare.

It is important that on exam student is active and ready to share interesting and exciting information on the subject, even beyond the actual question that is given, which can show that she/he is able to go deeper into the topic. Occasionally, the subject manager must stop the student - this is often necessary in order to have time to cover other learning outcomes. Such a situation is considerably more favorable than when examiners must “haul and pull” knowledge out of the student.

The student may ask the subject manager to get new questions if the candidate feels that she/he does not have much to answer to the question. Although this counts negatively, it opens up a possibility to explore other parts of the course, where the candidate, hopefully, can show that she/he masters curriculum significantly better. This is up to the student to take this opportunity.

Although subject manager leads the exam, it is possible for the student to break in and ask supplementary questions, as long as this does not take too much of the total time. It is common to get into several essential parts of the curriculum during the exam, and the examiners formulate the questions in such a way that the questions are in agreement with the learning outcomes defined on the subject's web page.

Along the way in the examination, notes are made as to the difficulty of the questions and the quality of the answers the student has given, with orientation on the grading characteristics described below. Since the subject manager (lecturer) is typically fully concentrated on the exam, it is often that the student writes most notes, but it could vary. The notes will ensure that the grading discussion after the examination is as thorough as possible. The preliminary discussion of the grade takes immediately after the examination and before the admittance of another student. The notes are taken care of after the exam. The final grade is given according to the grading system described above.

Grading criteria

Here, only a characteristic of the grades of 100%, 80% and 60% are given. The intermediate or lower grades are natural to use when the performance is between or below the given characteristics. The **final grades** are given for the following performance: **grade A** is given when the total percentage is between 100% and 90%, **grade B** - when the total percentage is between 90% and 80%, **grade C** - when the total percentage is between 80% and 70%, **grade D** - when the total percentage is between 70% and 60%, **grade E** - when the

total percentage is between 60% and 50%, and the **grade F** (fail) - when the total percentage is below 50%.

Grade 100% on oral exam is characterized by:

The presentation shows that the candidate both master the concepts, applications and the technical details, and that he/she has a very good overview of the subject and understands relations between its parts. Within the framework of the curriculum, the candidate appears to be able to discuss topics on equal footing with the examiner and sensor. The presentation and argumentation of student is clear, precise and well-organized, with the correct use of the professional terminology. Some minor inaccuracies may be allowed.

Grade 80% is characterized by:

The candidate can explain the main features of most key concepts, uses and arguments, but the presentation shows signs of lack of overview and/or independent thinking. The answers are easy to understand, but may have some formal shortcomings.

Grade 60% is characterized by:

The presentation shows that the candidate has knowledge of basic concepts, applications and techniques from several parts of the course, but has difficulty in describing arguments and contexts beyond the most basic ones. The answers are largely relevant, but reveal clear mistakes and misunderstanding.