

Evaluation: Phys 206 Statistical Mechanics and Thermodynamics, 2017

Lecturer: Liliana Velasco-Sevilla

1. Practical Implementation

First at all, I would like to bring to your attention that the description of the course Phys 206 has not changed since last year, when I also gave the same course and once more I would like to point out the following:

- (a) The course PHYS 206 at the University of Bergen (UiB), “Statistical Mechanics and Thermodynamics” is announced at the graduate level, according to the official description of the university. This attracts international students who already have a masters degree or are advanced undergraduate students.
- (b) Note that the 200 series of courses is offered to any undergraduate student of the UiB, who has already taken some prerequisite courses, for PHYS 206 these are: PHYS 115 and PHYS 201. Note that neither of those is thermodynamics.
- (c) Physics students of the Department of Physics and Technology at the UiB do not have a course in Classical Mechanics following Lagrange and Hamiltonian formalisms nor a strong mathematical background.

Therefore, is not easy to balance these conditions. In particular to balance a course where the most part of the audience is composed by foreign students with a better mathematical and physics preparation than the correspondent local students. The following implementation was made:

- (a) Textbook: The book by D. Schroeder, “An introduction to Thermal Physics”, Addison Wesley Longman, 2000 was chosen. This book is aimed at an advanced undergraduate level without too much mathematical background and without relying on the Lagrange and Hamiltonian formalisms. Note that the traditional book by F. Reif, “Fundamentals of statistical and thermal physics, Mc. Graw-Hill, 1965”, is out of print and it offers much more material of what is possible to cover in a semester.
- (b) Format of lectures: Close follow up of the selected chapters and sections of the textbook with a throughout development of results and some examples. During the kolloqvim, the teaching assistant solved all problems of the problem sets and encouraged the discussion among students.
- (c) Evaluation: Four compulsory problem sets (30%), one written midterm exam (20%) and one final oral exam (50%).

2. Failure rate, drop out and grade distribution

Failure rate: 0 failed. Drop out: 2 students out of 11 dropped out the course. The grade distribution is as follows: E, one student; C, two students, B, three students, A, two students. The ”E” corresponded to a student majoring in Chemistry who did not have the necessary mathematical background for the course.

3. The teaching facilities are o.k., however a much better quality of chalk and eraser should be offered. The quality of the chalk is particularly really bad and it is very hard to write.

4. Lecturer comments on student evaluation

(a) Method-implementation: The students were satisfied in general with the method-implementation.

(b) Summary of input:

- i. Amount of material: Students thought that the material was o.k.
- ii. Amount of work: Students thought that the amount of material was o.k.
- iii. Text book and notes: 50% of the students thought the book was very good, engaging, complementary, the rest considered good or o.k.
- iv. Quality of lectures: 20% of students considered the quality of lectures as outstanding and motivating. 40% that the quality was o.k. and 40% that quality was “below average, rarely fruitful or motivating”. Here, I would like to compare to the previous year that I gave the course: the students were quite satisfied with the quality of the lectures. The overall rank was “very good” and always above o.k, with the most part of the students ranking it as “outstanding”. In 2016 was very difficult to motivate students because they rarely expressed any interest in the subjects. I have asked at the beginning of the course if there were some applications they would like to see, but there were no inputs, I continued asking but still there were no inputs. In comparison, in 2015 most part of students show a great interest in applications of the problems and followups. I tried to understand the reason behind but I did not get any feedback from the students, I can simply comment that in 2016 the students were not motivated with the course material, not because of the way I was teaching, but because the subject itself did not appeal to them. As a result some of them found that unmotivating, on the other hand students with interest in learning the course material were quite engaged and motivated.
- v. Other comments For some students it is difficult to follow a through mathematical description of some subject and for others, with an excellent mathematical background that would seem trivial. Therefore it is hard to balance the two ends. One student mentioned that “more complete and correct sentences for explanations”. About the correctness, all that I gave was correct but he/she may refer that for him/her it did not appear so because of the mathematical language. I based the instruction on a low mathematical level because most part of the students did struggle with some more elaborated mathematics.

(c) Lecturer total consideration

Here, I would like to strongly point out that the official description of the course on the webpage of the UiB and other sources of information, should change. It is not updated. Also please demand as a pre-requisite a course on thermodynamics.

- i. **Amount of material:** The amount of material was the corresponding material of the syllabus. However, a course on thermodynamics should be made a pre-requisite for this course. That would spare some of the students with the material that is already covered there and allow more time to study more in depth the statistical mechanics part.

- ii. Amount of work: The amount of work was the adequate. I understand that students find hard to work for two or more courses which demand compulsory material, but this standard in other European Universities.
- iii. **Quality of lectures:** There is always room for improvement. I think the overall quality can still be improved by concentrating more on the statistical mechanics part and put as a requisite a Thermodynamics Part. Without that, one spends a lot of time going all over again the thermodynamics contents of the course. With thermodynamics as a pre-requisite, the course will be then followed by a more homogenous class which can work with a better background and the level of mathematics can be improved, improving overall quality and satisfaction on both ends: students and lecturer.
- iv. Students complained about the Teaching Assistant. For this year, the TA was a former student of last year course who was among the best. I do not doubt about his knowledge but probably he lacked sometime to prepare the problems and as it happens with very young people, it is not easy to explain throughly the problems and to adequate them to the different levels of knowledge for a very varied audience.