

PC132 Thermodynamics and Waves  
Lab Evaluation Results  
Wilfrid Laurier University

Terry Sturtevant

Winter 2014

**This evaluation for the purpose of evaluating my teaching methods and your impressions of the labs. It is anonymous and you can omit any question(s) you don't wish to answer.**

## **Labs in this Course**

Choose the answer which best expresses your feelings about the labs.

### **Demographic information**

1. I am taking this course because

**54%** it is required for my program, and I won't take any more physics than I have to.

**39%** it is required for my program, but I like physics.

**3%** it fulfills a science requirement, and is a personal interest.

**3%** it is not required for my program, but is a personal interest.

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2. How many of the existing lab sections could you have fit into your schedule?

**10%** all 6

**18%** 4

**25%** 2

**44%** This one or the opposite week one at the same time.

**3%** The section I am in is the only one I could fit into my schedule.

## Staff

3. The lab *demonstrator* was

**16%** more helpful than for PC131.

**3%** more knowledgeable than for PC131.

**23%** both more knowledgeable and more helpful than for PC131.

**11%** less knowledgeable and helpful than for PC131.

**46%** was about the same as for PC131 (*or, I didn't take PC131* )

4. The lab marking

**8%** was more fair than for PC131.

**16%** included more helpful feedback than for PC131.

**11%** was both more fair and more helpful than for PC131.

**25%** was less fair and less helpful than for PC131.

**39%** was about the same as for PC131 (*or, I didn't take PC131* )

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5. Compared to last term, the lab marking this term was

**7%** easier.

**41%** harder.

**30%** about the same.

**20%** about the same, but easier to satisfy because I knew what was expected.

**3%** I didn't take PC131 labs last term.

6. The lab *supervisor* (i.e. Terry) was

**5%** more helpful than for PC131.

**2%** more knowledgeable than for PC131.

**15%** both more knowledgeable and more helpful than for PC131.

**7%** less knowledgeable and helpful than for PC131.

**72%** was about the same as for PC131 (*or, I didn't take PC131* )

7. Comparing the lab this term to the lab last term,

**31%** I had different lab demonstrators each term, and the expectations were very different.

**23%** I had different lab demonstrators each term, but the expectations were very similar.

**11%** I had the same lab demonstrator each term, but the expectations were very different.

**33%** I had the same lab demonstrator each term, and the expectations were very similar.

**2%** I was not in the labs last term.

## Organization

8. What did you think about the the similarities in format, (manual, website, etc.), between the labs in PC131 and PC132?

**36%** It meant I had a better idea of what was expected this term.

**15%** The two courses were different enough that I don't think it mattered.

**20%** I found it all pretty confusing both terms.

**28%** I found it all pretty easy to follow both terms.

9. The amount of work required for the labs was

**41%** more than for the PC131 labs

**10%** less than for the PC131 labs

**13%** *much* more than for the PC131 labs

**3%** *much* less than for the PC131 labs

**33%** about the same as for the PC131 labs *or* I didn't do PC131 labs

10. The amount of potentially useful learning produced by the labs was

**34%** more than for the PC131 labs

**16%** less than for the PC131 labs

**3%** *much* more than for the PC131 labs

**7%** *much* less than for the PC131 labs

**39%** about the same as for the PC131 labs *or* I didn't do PC131 labs

## Material

11. The new marking checklist

**30%** was easy to use, even with the new sections, because it was similar to the checklist in PC131

**25%** was harder to use than the one in PC131 because of the new sections

**34%** was about as easy to use as the one in PC131

**2%** I didn't do PC131 labs.

**10%** I never really paid any attention to the checklist.

What did you think about the extra resources on the web site (links, videos, etc.)? For each item, use the following scale:

- (a) almost never
- (b) rarely
- (c) fairly often
- (d) almost always

12. ( **16%** **43%** **28%** **13%**) I *clicked on* the optional links.

13. ( **21%** **33%** **34%** **11%**) I *was helped by* the optional links.

14. ( **23%** **30%** **40%** **0%**) I *watched* the videos.

15. ( **18%** **31%** **33%** **16%**) I *was helped by* the videos.

## Questions and Tasks

16. To prepare for the labs, I read the appropriate material over before the lab

16% always  
33% most weeks  
23% sometimes  
23% rarely  
5% never

17. On average, preparing the pre-lab questions and tasks took

34% longer than for the PC131 labs  
16% not as long as for the PC131 labs  
10% *much* longer than for the PC131 labs  
33% about as long as for the PC131 labs *or* I didn't do PC131 labs  
7% I didn't usually do the pre-lab questions or tasks.

## Exercises

18. What statement best describes your experience of the *Linearizing Equations* lab exercise?

45% It was useful for these labs.  
2% It has been useful in other courses as well.  
32% It will probably be useful in other courses in the future.  
22% It was not useful and a waste of time.  
0% I didn't do that exercise.

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19. What statement best describes your experience of the *Graphing and Least Squares Fitting* lab exercise?

**40%** It was useful for these labs.

**7%** It has been useful in other courses as well.

**38%** It will probably be useful in other courses in the future.

**10%** It was not useful and a waste of time.

**5%** I didn't do that exercise.

20. What statement best describes your experience of the *Library Research* lab exercise?

**10%** It was helpful and informative for these labs.

**63%** It was helpful and informative for my university career in general.

**18%** It was not helpful or informative for any of my work.

**7%** I didn't do that exercise.

21. What statement best describes your experience of the *Plotting Curves using a Spreadsheet* lab exercise?

**32%** It was useful for these labs.

**8%** It has been useful in other courses as well.

**35%** It will probably be useful in other courses in the future.

**22%** It was not useful and a waste of time.

**3%** I didn't do that exercise.

## Online Quizzes

22. Did the online quizzes help you remember important points from the lab?
- 31% Yes, almost all of the quizzes helped that way
  - 26% Yes, one or two quizzes helped that way.
  - 20% Not really; I would have remembered those points without the quizzes.
  - 20% Not really; even after the quizzes I didn't get those points.
23. Do you think it would have worked better to read the material and do the quizzes *before* the lab instead?
- 30% Yes, that would have speeded up the lab.
  - 21% Yes, that would have made the point of the lab more clear.
  - 39% No, it would have been really hard to understand the material without doing the lab first.
  - 10% The quizzes and lab seemed pretty much unrelated.
24. Did the online quiz help you understand the important points?
- 28% Yes; answering the questions clarified what was important.
  - 30% Yes; correcting my mistakes in the quiz helped me remember.
  - 11% both of the above
  - 30% neither of the above
25. Including reading documents or watching videos and doing the online quizzes, about how long did you spend each week related to the quizzes?
- 36% Less than 15 minutes
  - 43% Between 15 minutes and 1/2 hour
  - 11% Between 1/2 hour and 1 hour
  - 8% More than 1 hour
  - 2% It varied greatly, from a few minutes to more than 1/2 hour.



## Experiment

26. What statement best describes your thoughts on taking the first several weeks including the linearizing and graphing exercises to produce the lab report?
- 46% It was about as useful as the original submission for *Measuring 'g'* in the fall.
  - 25% It wasn't as useful as the original submission for *Measuring 'g'* in the fall.
  - 23% It was more useful than the original submission for *Measuring 'g'* in the fall.
  - 7% I didn't do both exercises and/or the first lab report.
27. What statement best describes the feedback from your IA that you got on the original submission of the lab report?
- 36% I found it pretty useful.
  - 30% I didn't find it very useful.
  - 20% I didn't hand in a report at the original submission date; I only handed in a report at the final lab period.
  - 3% I didn't hand in a revised report; I only handed in an original submission.
  - 11% I didn't hand in a *Standing Waves on a String* report.
28. What statement best describes the mark you received on the *original submission* of the *Standing Waves on a String* report?
- 3% It was higher than I expected.
  - 39% It was lower than I expected.
  - 28% It was about what I expected.
  - 25% I didn't hand in a *Standing Waves on a String* report.

29. What statement best describes your experience with the Writing Centre for the original submission of the lab report?
- 15% I found it pretty useful, and I would contact the Writing Centre again in the future.
  - 0% I found it pretty useful for this lab, but I don't think I would contact the Writing Centre again in the future.
  - 15% I didn't find it very useful for this lab, but I might contact the Writing Centre again in the future.
  - 7% I didn't find it very useful for this lab, and I don't think I would contact the Writing Centre again in the future.
  - 64% I didn't go to the Writing Centre.

## Results

30. The lab report and the lab test are different ways to assess knowledge of lab concepts. Pick whichever best describes how you feel about this:
- 18% The lab test is a better evaluation of a student's knowledge than the lab report.
  - 33% The lab report is a better evaluation of a student's knowledge than the lab test.
  - 33% The lab report and the lab test evaluate the knowledge in different ways, so both are valid.
  - 15% Neither the lab report nor the lab test are useful ways to evaluate a student's knowledge.

31. What was your impression of the lab test? Pick whichever best describes how you feel about this:

**49%** I thought the lab test reasonably examined the concepts in the lab.

**21%** Some of the concepts that were on the test seemed unrelated to the labs.

**30%** Even though all of the concepts were familiar, some of the questions were too difficult.

32. The purpose of the labs in this course was to teach *lab skills*, (e.g. data analysis, report writing, etc.), which is totally different from the purpose of the lectures which was to teach *physics*. Pick whichever best describes how you feel about this:

**54%** I understand that distinction, and think it made sense to do both.

**38%** I understand that distinction, but don't think it made sense to do both.

**3%** I don't understand that distinction, and don't think it made sense to do both.

**3%** I don't understand that distinction, but it was ok to do both.

33. The amount of potentially useful learning produced by the labs was

**36%** more than for the PC131 labs

**13%** less than for the PC131 labs

**5%** *much* more than for the PC131 labs

**11%** *much* less than for the PC131 labs

**34%** about the same as for the PC131 labs *or* I didn't do PC131 labs

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34. In the PC131 labs, and even more in the PC132 labs, the time taken analyzing data was much greater than the time taken doing experiments. What did you think of that?
- 25% Spending more time analyzing data allowed me to have a deeper understanding of what was going on.
  - 21% Spending more time analyzing data made the lab reports much more complete.
  - 23% Both of the above are true.
  - 18% Neither of the above are true.
  - 13% I don't really care how the work is divided up; it's the total amount of time and effort involved that matters to me.

## Performance

35. The amount of effort which I put into the labs was affected by external factors like midterms, assignments, etc.
- 8% never
  - 15% rarely
  - 28% sometimes
  - 31% often
  - 18% always
36. My marks in these labs have been
- 34% lower than I expected.
  - 15% higher than I expected.
  - 15% *much* lower than I expected.
  - 0% *much* higher than I expected.
  - 36% about what I expected.

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For the following questions, use the following scale to indicate how useful you found each of these resources for writing your lab report:

- (a) very
- (b) somewhat
- (c) a little
- (d) not at all
- (e) I didn't consider it.

37. ( **34%** **31%** **21%** **8%** **5%** ) Sample lab report on the website
38. ( **18%** **20%** **18%** **15%** **28%** ) Feedback from IA on original submission
39. ( **46%** **18%** **21%** **2%** **13%** ) Help session run by IA
40. ( **30%** **25%** **23%** **8%** **15%** ) Lab report from PC131
41. When writing up my lab report,
- 52%** I found the sample lab report on the web site helpful, even without a sample lab.
  - 16%** I think I might have found the sample lab report on the web site helpful *if there was* a sample lab.
  - 16%** I didn't find the sample lab report on the web site very helpful, since it talked about a lab we didn't do.
  - 8%** I thought the expectations were pretty clear without having to look at the sample lab report.
  - 7%** I wasn't really clear on the expectations and I never looked at the sample report.

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42. Comparing my marks in the lab to my marks on tests, etc. in this course,

**31%** my lab mark is lower (5-15%) than my other marks in this course.

**13%** my lab mark is higher (5-15%) than my other marks in this course.

**16%** my lab mark is much lower ( $>15\%$ ) than my other marks in this course.

**8%** my lab mark is much higher ( $>15\%$ ) than my other marks in this course.

**31%** my lab mark is about the same ( $\pm 5\%$ ) as my other marks in this course.

43. Which way would you rather establish a grade in a course?

**18%** Do a few things, each requiring a high performance standard ( $>80\%$ ).

**37%** Have many small things, each weighted about equally, requiring work fairly uniformly distributed through the term.

**5%** Hand in many things with a low weight early in the term, building up to one or two major assignments late in the term which are heavily weighted.

**25%** Use a sliding scale, where the weight of individual things depends on how well they are done, so that the number of things required can vary.

**15%** Have fixed weights for everything, but have more total marks than needed so you can choose which things to do.

44. The amount of work required for the labs was

**32%** more than what was justified for the weighting of lab marks.

**13%** less than what was justified for the weighting of lab marks.

**13%** *much* more than what was justified for the weighting of lab marks.

**2%** *much* less than what was justified for the weighting of lab marks.

**40%** about what was justified for the weighting of lab marks.

## Comparison to other courses with labs

45. What other types of *science* labs are you taking or have you taken at university?

**67%** I've only had labs in math or computer science.

**11%** I've had labs in chemistry or biology.

**2%** I haven't had chemistry or biology labs, but have had labs in kinesiology or psychology.

**11%** I've had labs in at least 3 science disciplines other than physics.

**8%** I haven't had any other science labs.

46. What statement best describes your experience of the interest inspired by the labs?

**16%** These labs were more interesting than labs in other science courses.

**25%** These labs were less interesting than labs in other science courses.

**18%** These labs were *much* less interesting than labs in other science courses.

**25%** These labs were about as interesting as labs in other science courses.

**16%** I haven't had any other science courses with labs.

47. The labs in this course were intended to teach different material than was taught in lectures. What is it like in your other science courses with labs?

**23%** Labs and lectures teach different things, and this is helpful.

**52%** Labs reinforce lectures, and this is helpful.

**7%** Labs and lectures teach the same things, and this seems redundant.

**7%** Labs and lectures teach different things, and this is confusing.

**11%** I haven't had any other courses with labs.

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48. The relationship between the lecture material and labs was

- 11% closer than in other science courses with labs.
- 25% not as close as in other science courses with labs.
- 36% not *nearly* as close as in other science courses with labs.
- 7% about as close as in other science courses with labs.
- 21% I haven't had any other science courses with labs.

49. The reports required for these labs are

- 30% more complex than those in other science courses, but they seem more worthwhile.
- 13% fairly similar to those in other science courses.
- 25% more complex than those in other science courses, but no more valuable.
- 0% less complex than those in other science courses.
- 33% I haven't had any other science courses with lab reports.

50. The amount of work required for the labs

- 33% was more than what was required in other science courses with labs.
- 15% was less than what was required in other science courses with labs.
- 13% was *much* more than what was required in other science courses with labs.
- 18% was about the same as what was required in other science courses with labs.
- 21% I haven't had any other science courses with labs.



51. What statement best describes the relevance of the labs to your career in science?

16% These labs were more relevant than labs in other science courses.

39% These labs were less relevant than labs in other science courses.

16% These labs were neither more nor less relevant than labs in other science courses.

13% I don't intend to do any more science courses with labs.

15% I haven't had any other science courses with labs.

## Miscellaneous

52. I think an evaluation this long is

17% a great idea; other courses should do the same.

40% a good idea if students get to see the results.

33% not very useful since it probably doesn't change very much.

10% a total waste of time.

53. After doing the labs for PC131 and PC132 I think the main purpose of the labs *should* be

33% to demonstrate important physics principles.

20% to teach about the research process.

18% to teach about data analysis, including the use of tools such as spreadsheets.

23% all of the above; no one goal should predominate.

7% I don't really care, as long as the work isn't too hard.

54. My overall impression of a course, (i.e. whether I like it or not), primarily depends on

**39%** how much I learn.

**13%** how much work is involved.

**23%** what mark I get.

**13%** how interesting the instructor is.

**11%** The answer depends on whether the course is required or an elective.

55. What do you think about online audio and video presentations and/or podcasts for instruction? (Pick whichever fits best.)

**18%** I've found some which were very good at explaining something.

**30%** I think they would be a good addition to many courses.

**21%** Both of the above are true.

**11%** Neither of the above are true.

**20%** I haven't really looked for or been directed to any, so I don't know.

## Resources

56. What do you think about using computer cards for this evaluation?

**55%** I like the anonymity it provides.

**15%** It's a good idea, but it's way too long.

**8%** I'd rather have a chance to write in comments on paper.

**5%** I prefer using *RateMyProfessors.com* to any in-class evaluations.

**17%** I don't really care much.

57. Comparing the labs to the rest of the course

**70%** the labs take longer than preparing for the quizzes.

**8%** preparing for the quizzes takes longer than the labs.

**18%** neither doing the labs nor preparing for the quizzes take much time.

**3%** both doing the labs and preparing for the quizzes take a long time.

58. Did the similarity in format and expectations to the PC131 labs help you in the PC132 labs?

**52%** Yes, quite a bit.

**31%** Yes, but only a little.

**7%** No, but neither one seemed very hard.

**7%** No, this was like a completely different endeavour.

**3%** I don't remember PC131 *or* I didn't take PC131.

59. How have your university marks been compared to your high school marks?

**11%** My university marks have been *much* (>10 %) higher.

**18%** My university marks have been *a little* (<10 %) higher.

**25%** My university marks have been about the same.

**36%** My university marks have been *a little* (<10 %) lower.

**10%** My university marks have been *much* (>10 %) lower.

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60. Do you like courses using MyLearningSpace?

- 69% Yes; I've had some use it and thought it worked well.
- 20% Somewhat; some courses use it well and some use it poorly.
- 5% No; it's inconvenient most of the time.
- 5% I don't think it makes a lot of difference one way or another.
- 2% I haven't had to use it much so I couldn't say.

For the following questions, use the following scale to indicate how many of your instructors deliver course material in these ways:

- (a) virtually all ( $\gtrsim 90\%$ )
- (b) most ( $\approx 60 \rightarrow 90\%$ )
- (c) some ( $\approx 40 \rightarrow 60\%$ )
- (d) little ( $\approx 10 \rightarrow 40\%$ )
- (e) none ( $\lesssim 10\%$ )

61. ( **25%** **41%** **21%** **11%** **2%** ) MyLearningSpace

62. ( **13%** **22%** **30%** **33%** **2%** ) Course or instructor website

63. ( **2%** **15%** **16%** **46%** **21%** ) Printed handouts

64. ( **21%** **26%** **25%** **20%** **8%** ) In-class announcements

65. **In order to improve teaching beyond my own courses, I'd like to be able to share the results of these evaluations with other instructors, students, etc. May I have your permission to do that?**

- 75% Yes, I'd be glad if any improvement could come from this.
- 25% Yes, this is anonymous enough that I don't mind how the results are used.
- 0% No, this isn't anonymous enough for me to be comfortable with the results being shared.
- 0% No, even though this is anonymous I don't want the results to be shared.