

Junior comprehensive assessment (“comps”) in Physics

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As mentioned in seminar, Wittenberg requires all students to successfully complete an assessment of academic achievement in their major. The assessment process for Physics has two parts, both normally taken in the junior year.

The first focuses on problem solving. For the problem solving part of the assessment, you'll be given a problem on a topic related to your first Junior Seminar talk. We'll also provide an example of a model presentation and a copy of the rubric to be used in the evaluation. At a later seminar meeting, you'll give a presentation of the solution to your assigned problem. The presentation is evaluated by faculty using a rubric focusing on quantitative problem-solving skills (see next page). If the presentation is judged to be unsatisfactory, the student must redo the presentation slides in order to bring the work up to a satisfactory level.

The second part of the assessment focuses on core concepts ("qualitative"). This part of the assessment will be given early in the second semester of the junior year, around mid-to-late January. The exam includes multiple-choice and short answer questions on physics concepts from the first four semesters of the physics major curriculum: Physics 200, 213/214/215, 218, and 220. If you haven't had all of these classes yet, you'll take only the sections for which you've already taken the corresponding class, and then you'll take the remaining section(s) next year. (Seniors, let me know if you have questions about which sections you still need to take.) The exam will take about two hours. An overall score of 70% is required to pass. Students with non-passing scores will be required to participate in a special activity that focuses on concepts they had the most trouble with. We highly recommend studying for the conceptual exam! To start, take a look at the Stop to Think exercises in Knight, and at conceptual/qualitative questions on your past exams.

Please let any of the faculty know if you have any questions or concerns, or want to talk about other resources for preparing talks or studying for the conceptual exam.

How the quantitative (problem-solving) comps presentations will be evaluated

The presentations will be evaluated by faculty in the five areas listed below.

For each of the five areas, scores from 0-5 will be assigned as follows:

0: no content at all in this area

1: the content in this area is entirely inappropriate or incorrect

2: large pieces are missing, or the content in this area is mostly inappropriate or incorrect

3: some of the content in this area is inappropriate, missing, or incorrect

4: minor omissions or errors

5: complete and appropriate

The highest possible score is 25; presentations that receive an average score of 20 or above are judged to be satisfactory and will not require revision.

Here are the five areas that will be evaluated:

Useful description of the problem

How well information from the problem statement is organized into an appropriate and useful description. Depending on the type of problem, this may include such things as specifying known information, assigning appropriate symbols, stating a goal or target quantity, showing a sketch or picture of the physical situation, stating what characteristics the answer should have, drawing a graph, defining coordinate axes, and/or choosing a system.

Appropriate physics approach

The correctness and appropriateness of the physics concepts and principles selected for solving the problem.

Specific application of physics to the problem

The correctness and appropriateness of the actual application of the physics concepts and principles to the specific conditions in the problem. Depending on the problem, this may include such things as connecting the objects and quantities in the problem to the appropriate terms in specific physics relationships, applying initial conditions or other constraints, and making appropriate use of assumptions in the problem statement.

Use of appropriate mathematical procedures

The correctness and appropriateness of the mathematical procedures and rules used in obtaining the solution.

Coherence and logical progression

The extent to which the presentation of the overall problem solution is clear, focused, and organized. The results should follow logically from what is presented, and the results should make sense.