Student Learning Outcomes for the Physics Program at Lyon College

1. Students who complete the physics [210]/[220], [240]/[250], [241]/[251] sequence are able to

1a. Articulate the basic principles of physics.
1b. Apply the basic principles of physics to solve a variety of qualitative and quantitative problems at the introductory physics level.

This can be measured with portions of currently-used standard exams and exam problems.

General Education learning outcomes for [210,240,241]/[220,250,251]

Critical thinking: [210,240,241]/[220,250,251]
Inquiry and analysis: [241]/[251]
Quantitative literacy: [210,240,241]/[220,250,251]
Teamwork: [241]/[251]
Information literacy: [210,240,241]/[220,250,251]
Scientific thought: [210,240,241]/[220,250,251]

Portions related to [241]/251] will be evaluated for 3 selected labs with rubric data recorded. Since students are allowed to submit revised reports, it is anticipated that this will normally serve as verification, however data is recorded for the initial submission before revision. Portions related to [210/240]/[220/250] rubric will have data recorded for 5 selected problems; one from each exam.

Critical thinking is regularly evaluated in [210,240,241]/[220,250,251]. In [210,240] / [220,250] it is evaluated in terms of starting with correct physical principles applicable to a given situation and being able to follow it through to completion. It is evaluated by use of exam problems. In [241]/[251], it is part of the process of scientific thought and is evidenced by use of supporting data for a hypothesis as is required by the lab rubric.

Inquiry and analysis is regularly evaluated in [241]/[251] as part of the required element of completed lab write ups. It is evidenced by student explanation of the experiment and is a required element by the rubric.

Quantitative literacy is evidenced primarily in [210,240]/[220,250] by successful completion of physical problems with correct units and correct numerical operations. It is evaluated by use of exam problems. Quantitative literacy is exhibited in [241/251] by students being able to follow through with calculations partially enabled by spreadsheet examples and being able to interpret the results. This is evidenced by the write up and is a required element by the rubric.

Teamwork is regularly evaluated in [241]/[251] and is evidenced by successful team completion of lab write ups as is required by the rubric.

Information literacy is regularly evaluated in [241]/[251] and is evidenced by correct physical terminology in lab reports as required by the lab rubric. It is also a significant portion of [210,240]/[220,250] and is evidenced by student success in using the basic physical terminology enabling students to correctly initiate quantitative solutions to physical situations.

Scientific thought is regularly evaluated in [241]/[251] and is evidenced by use of hypothesis with supporting evidence (or not supporting evidence) based upon experiment as is required by the lab rubric for 3 selected labs.