



Program Assessment Report (PAR)

Physics, BS (PHY) Baccalaureate Degree

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ACADEMIC YEAR COVERED BY THIS REPORT: 2020-2021

I. PROGRAM LEARNING OUTCOMES

Graduates will be able to

- Apply and integrate sound knowledge of several core areas of physics including mechanics, modern physics, electricity and magnetism, statistical mechanics, optics, instrumentation, and quantum mechanics (Outcome 1).
- Understand and conduct research in physics at a level appropriate to an undergraduate major (Outcome 2).
- Analyze and communicate research results effectively in multiple oral and written representations (Outcome 3).

II. PROCEDURES USED FOR ASSESSMENT

A. Direct Assessment

Direct measures that will be used to assess* each learning outcome

- The oral presentation of the student's mandatory senior research project (PHY 4940) will measure all three outcomes with data solicited from faculty members attending the student's presentation. In particular, these faculty will be asked how well the student met each of the three outcomes above, with possible answers very well, fairly well, not well, and cannot judge, with comments to accompany each response.
- Data solicited from faculty who mentor and teach the senior research project required of all seniors, PHY 4940, with the same questions as described above measuring Outcome 1 and Outcome 2. The student's written report and oral presentation on the project will be measures of Outcome 3.
- Data solicited from faculty teaching selected advanced undergraduate courses with the same questions listed in the first item above measuring Outcome 1.

*The American Physical Society (APS) is currently finalizing the Effective Practices for Physics Programs (EP3) Project. EP3 will provide a guide for self-assessment of undergraduate physics programs founded on documented best practices linked to measurable outcomes. The American Physical Society (APS) is a nonprofit membership organization working to advance and diffuse the knowledge of physics through its outstanding research journals, scientific meetings, and education, outreach, advocacy, and international activities. It had been expected that the

EP3 guide would have been available by now, but its release was delayed and is now scheduled for early 2021. The Wright State University Department of Physics has delayed making any significant modifications to its assessment design and implementation until access to EP3 is possible. The WSU Physics Department is committed to developing and utilizing an assessment approach that is viewed as the gold standard, as outlined in the EP3 guide, as regarded by the national physics community.

B. Scoring of Student Work

Both quantitative and qualitative assessment of senior project (PHY 4940) oral presentations and final written reports is accomplished with a scoring rubric. This rubric is attached as a supporting document.

C. Indirect Assessment

Exit interviews with recent graduates will be used to measure all three outcomes. Every third year an alumni survey will be conducted. Assessment of the program will also be accomplished indirectly via tracking outcomes of the current academic year's graduating seniors in regard to career trajectories.

III. ASSESSMENT RESULTS/INFORMATION:

1. Direct Assessment - Due to complications associated with the impact of COVID-19 on senior projects, no direct assessment was conducted for the 2020-21 academic year. 2. Indirect Assessment

1. None 2. During the 2020-21 academic year, 3 students completed the B.S. degree in Physics at WSU. Two of them are research scientists working at local tech firms. The whereabouts of the 3rd student is unknown.

1. None 2. The WSU Physics B.S. program prepares and positions its graduates for post-college success in regard to additional academic pursuits and/or career placement. Confidence in the department's graduates by outside employers and other universities is an indirect indication of the students' knowledge of physics and their ability to apply that knowledge.

IV. ACTIONS TO IMPROVE STUDENT LEARNING

The Physics Department Undergraduate Studies Committee (USC) will gather, analyze and summarize all assessment data and information. Based on its findings, recommendations for improvements in meeting objectives and learning outcomes will be made by the USC and communicated to the entire faculty. Results from the prior academic year will be presented to the department in the subsequent fall annually. Every three years, an alumni survey will be conducted. Based on the outcome assessments and the alumni survey, a summary of recommendations will be compiled every three years. Per the earlier comment, upon gaining access to the APS Effective Practices for Physics Programs in early 2021, in addition to utilizing it to adopt a more comprehensive assessment plan for the department, the department will also adapt a regular and annual review process that will include analyzing and reacting to annual assessment information.

V. SUPPORTING DOCUMENTS

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.