Saint Louis University
Program Assessment Annual Reporting

It is recommended program assessment results be used to *celebrate achievements of student learning* as well as to *identify potential areas for future curriculum improvement*.

Please email this completed form as an attachment to ***thatcherk@slu.edu***
CAS PROGRAMS: Please email this completed form by July 1 to Donna LaVoie lavoiedj@slu.edu

1. **Degree Program(s) included in this report: PHYS BA and PHYS BS**
2. **Department: Physics**
3. **School/Center/College: Arts and Sciences**
4. **Name(s): William D. Thacker**
5. **Email: thackerwd@slu.edu**
6. **Phone: 314-977-8422**

Instructions: Please answer the following **five** questions to the best of your ability for each degree program offered within your department.

1. Summarize your **assessment activities** during the past year for each degree program and how this work relates to the established assessment plan *(e.g. what program outcomes were assessed, faculty discussions, new survey design, data collection, revised assessment plans or learning outcomes, etc.).* Please include how Madrid courses/program were involved.

The Department of Physics met June 7, 2017 to discuss and assess the following two outcomes for the Physics BA and BS degree programs:

2. Students will design and conduct experiments and analyze and interpret data,
3. Students will collaborate effectively on teams,

in accordance with the schedule set by the established assessment plan. The following course assignments were utilized to assess **Outcome 2**:
Modern Physics Lab. Design and conduct an experiment to measure current and calculate magnetic fields in the Helmholtz Coils (pair of coils, single loop, or other configurations). Verify the calculated values of magnetic field B vs Distance for several sets of points.
Analog and Digital Electronics. In the lab "High-Gain Amplifiers", students were asked to design, build, and test a high-gain amplifier. Significant part of the lab was devoted to investigating amplification against parameters used in the circuit. Students would collect large amount of data and analyze it to come up with the optimal amplification circuit given the specifications.
The following course assignments were utilized to assess **Outcome 3**:
Modern Physics Lab. Use electron diffraction to determine the Miller indices of an unknown material. Each student was required to collect experimental data on one or two sources (record diffraction patterns) and share the data with the remaining group members. Once all data was shared, students would brainstorm as a group to analyze the data and determine the Miller indices.

Analog and Digital Electronics. In the lab "Standalone CLR meter with multi-digit display" students were asked to build a fully functioning standalone LCR meter prototype. The display was assembled out of about 50 simple digital components and students were asked to design and assemble the prototype in teams. They would discuss in teams and present the design of the device and then divide up the tasks of assembly and testing of parts of the circuit.

The following rubrics were used for level of achievement of each outcome:
1.Below Expectations
2.Progressing to Expectations
3.Meets Expectations
4.Exceeds Expectations

2. Describe specific **assessment findings** related to the **learning outcomes** assessed for each degree program, including any pertinent context surrounding the findings. Please include the **learning outcomes themselves**. *(e.g. Our goal was that 75% of students performed at the "proficient" level of competency in problem solving, using a new scoring rubric. 81% of students performed at the "proficient" level in problem solving, exceeding our expectations.)* Do not include student-level data. Data included in this report should be in aggregate. Please include how Madrid courses/program were involved.

Outcome	Level of Achievement
2. Students will design and conduct experiments and analyze and interpret data	3.1
3. Students will collaborate effectively on teams	3.6

Our goal is that the average level of achievement on each learning outcome is greater than or equal to 3 (meets expectations).

**Please attach any tables, graphics, or charts to the end of this report.*

3. Describe how assessment **feedback** has been provided to students, faculty, and staff. *(e.g. report for faculty, executive summary for the dean, web page for students, alumni newsletter, discussion with students in class or club event, etc.)*

This report will be sent to the Associate Dean and will eventually be posted on the website http://www.slu.edu/the-office-of-the-provost/assessment-of-student-learning/program-level-assessment/college-of-arts-and-sciences

where it can be viewed by faculty, staff, students, and alumni.

4. In what ways have you **used assessment findings** to celebrate student achievements and/or to improve the curriculum this past year? *(e.g. prizes to students, hosting student parties, changes to curriculum, student projects, learning goals, assessment strategies, etc.)*

We do not use assessment findings, which are aggregate scores, to celebrate achievements of individual students.
Continuous improvement - Student Outcome 2: In the upper division Laboratory courses, such as Modern Physics Lab, Optics Lab, and Analog and Digital Electronics, students are asked to approach each lab assignment as an experimental "mini" research project originally carried out over a three hour period once a week. Students research the literature to obtain an in depth understanding of the scientific background for the project, then work together to plan and execute the data acquisition and analysis. Finally, the students would independently write a lab report in the form of a scientific technical report. It was observed that the lab reports lacked sufficient depth; apparently one three hour period was not enough for the in depth analysis and reporting demanded of the students. Consequently, the lab assignments were extended to two class periods. This gives the students more time to work in groups setting up the experiment, taking data and discussing whether the data is meaningful. In the case that an error has occurred the extra class period gives the students time to redo parts of the experiment. Preliminary observations indicate improvement in the lab reports; future assessment cycles will determine whether this improvement is significant.

5. Describe any changes to your assessment plans, or any challenges or educational experiences with the **assessment process** this past year that you would like to share.

No changes were made in the assessment plan.

*Please submit any **revised/updated assessment plans** to the University Assessment Coordinator along with this report.*