

Program Performance Review: Culmination Meeting Memo Physics BS, MS

The 2021-2022 Program Performance Review (PPR) process for the Physics, BS and MS programs in the College of Natural Sciences and Mathematics (NSM) concluded with a culmination meeting on November 15, 2022.

The following people attended the meeting: Carolyn Thomas (Provost), Ed Fink (AVP for Undergraduate Academic Programs, AVPUAP), Elaine Frey (AVP for Graduate Studies, AVPGS), Marie Johnson (Dean, NSM), Sean Walker (Associate Dean, NSM), Ionel Tifrea (Department Chair), and Su Swarat (Senior AVP for Institutional Effectiveness and Planning, SAVPIEP).

The Provost congratulated the programs for successfully completing the PPR process. The review made it clear that Physics is a strong department committed to student success. Under the department and college leadership, the department took the PPR process seriously, and has already generated actionable plans to address the issues raised through the process. The following specific accomplishments were highlighted during the PPR process:

- The department's commitment to undergraduate and graduate student success is evident in students' strong sense of identity as physicists. Students have access to quality advising and mentoring, multiple track options to ensure timely graduation, and opportunities to engage in research and attend conferences to present their work. The Provost commended the faculty for working with students of different levels to cultivate the scientific mindset.
- The department is collegial with a positive relationship between students, faculty, and staff.
- Students enjoy the student lounge to socialize, collaborate, and build a sense of community. The sense of community among students is evident.
- Faculty promote a strong student-faculty research culture, which contributes to high research productivity as reflected in receiving external grants and philanthropic support. The Provost commended the department for engaging students in research as part of their curriculum.
- The department's clear tenure process and mentoring foster a collegial environment. The decision-making associated with the tenure and promotion process is understood among the faculty.
- Staff members have positive relationships both within the department and across other departments within the College of Natural Sciences and Mathematics. Staff feel valued and know that their contribution is appreciated.

Major recommendations and issues raised through the PPR process were discussed as follows:

1. Enrollment:

- The external reviewers recommended the department to strengthen student recruitment strategies to increase the diversity of the student body.
- For the BS program, the Chair reported that enrollment is a challenge, as few students take physics in high school, which leads to little exposure or interest. The program takes in more transfer students, though some of them are not sufficiently prepared to graduate in two years.
 - All agreed on the importance of cultivating interest in the discipline among undergraduate students. The Dean commented that the college hopes courses like

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“Think Like Einstein” and “Astronomy 101” would help attract students to physics. The Chair stated that the new course “Quantum Computing for Everyone” hopefully helps with the same goal.

- For the MS program, the AVPGS commented that program enrollment has been stable over the years. She asked about the possibility of consolidating fall and spring admission into fall-only to build one strong cohort per year.
 - o The Chair stated that spring admission is necessary, because the spring cohort (which is small) are typically students who need to take prep classes in the fall before enrolling.
 - The Associate Dean and the AVPGS recommended the department to formalize this arrangement by offering conditional admission to these students in the fall.
 - o The Chair also stated that recruitment fluctuates with the job market. He thinks the program is of a good size. There are enough applications to increase enrollment, but the capacity is limited by other factors. For example, recently, all students in the program choose to graduate based on a path that requires research, and implicitly the number of students in the program is limited by the research experiences the department can offer.

2. Curriculum:

- The external reviewers recommended the department to provide clearer articulation of degree pathways to support student success. The AVPUAP specifically asked about the prerequisite for PHYS 300.
 - o The Chair stated that faculty will discuss this issue in the retreat planned for spring, which is focused on curriculum.
 - o The Dean asked the department to think about whether there should be more opportunities for students to be exposed to physics as a major prior to PHYS 300. The Provost concurred and encouraged the department to explore ways to “tell the story of physics” to attract more students.
- The external reviewers recommended the inclusion of PHYS 416/516 Statistical Mechanics into the required undergraduate/graduate curriculum (currently the classes are offered as electives).
 - o The Chair agreed and reiterated that a faculty retreat has been planned for the spring to review and update the curriculum.

3. Comprehensive exam option for MS students:

- The AVPGS inquired the necessity of keeping the comprehensive exam option for the MS Program.
- The Chair stated that this option was created to accommodate students who work in the industry and do not want to pursue research. The student population has shifted in recent years with most students now interested in pursuing a PhD program after graduation. As such, all graduate students work in the labs, and naturally take the project/thesis option. The advisors are advising against the comp exam option because some of the classes needed are not always offered, which in turn delays graduation. The number of students taking the comp exam option is now very small.

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4. Society of Physics Students (SPS) chapter:

- The external reviewers recommended the department to reinstate the Society of Physics Students (SPS) chapter with a faculty advisor to further enhance undergraduate students' engagement with the program.
- The Chair reported that this was done. A group of 300-level students is now organizing the chapter with the support from the American Physics Society.

5. Large classroom access:

- The department identified the need for greater access to large lecture rooms to help increase astronomy, life-science and engineering physics offerings. The Chair added that they are specifically hoping for 200-seat classrooms, ideally in McCarthy.
- The Associate Dean reported that a classroom usage review was conducted by the Associate Deans last year. The issue was that these large classrooms are typically available only at times faculty do not want to teach or students do not want to take classes.
- The Provost commented that classroom assignment will be examined on a larger institutional level to optimize classroom use.
- The SAVPIEP recommended the program to think about offering some of the classes online. The Chair reported that the department is ready to do so and stated that online sections tend to fill out quickly.

The Provost concluded the meeting by thanking the Chair, Dean and Associate Dean for their leadership and hard work, and thanking the physics department for its great contribution to the university and to student success.