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**COMMITTEE ON ACADEMIC PLANNING AND REVIEW**

18-19 CAPR 15  
Thursday, February 21, 2019

**TO:** The Academic Senate

**FROM:** The Committee on Academic Planning Review (CAPR)

**SUBJECT:** 18-19 CAPR 15: CAPR analysis of Physics 5-year program review

**PURPOSE:** For Action by the Academic Senate

**ACTION REQUESTED:** Acceptance of the Five-Year Program Review of the Department of Physics; it is recommended that the program continues without modification.

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**BACKGROUND:**

At its meeting on February 21, 2019, CAPR members unanimously approved the [Physics 5-year program review](#). This approval was based on conversations with the lead writer of the report and Dr. Erik Helgren during CAPR meetings (Fall, 2018; Spring 2019) and via conversations with the CAPR liaison. The summary document provided was reviewed and approved by the Dr. Helgren and his peers. The summary of the five-year review is attached to this memo. It is recommended that the program continues without modification.

Following approval of this memo by the Senate, the Provost will review the summary and meet with members of the Department of Physics and the CAPR chair at a time mutually agreeable during the Spring 2019 term to devise a clear 5-year plan moving forward. The Provost will then create a Memorandum of Understanding (MOU) with the Department of Physics and return that MOU to the Senate as an information item as soon as possible (completion of a MOU may require extension into the following Fall semester given scheduling timelines).

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## 5-Year Review Summary, Physics Department

### 1.0 BACKGROUND

At its meeting on December 6<sup>th</sup>, 2018, CAPR invited Prof. Erik Helgren from the Physics Department to discuss the program's 2017-18 five-year review. Following this meeting, the liaison to the department/ program, Kevin Kaatz, History Department, worked with Prof. Helgren, the writer of the 5-year review to complete the following summary.

### 2.0 CHECKLIST OF DOCUMENTS SUBMITTED WITH THE 5-YEAR REVIEW

- Self-Study (pp. 4-59)
- Five-year plan (pp. 60-76)
- External reviewer's report (pp. 77-85)
- Program response to the external reviewer's report (pp. 85-90)

### 3.0 CAPR ANALYSIS/EXECUTIVE SUMMARY

**BRIEFLY DESCRIBE THE PROGRAM(S), NUMBER OF STUDENTS SERVED, FACULTY AND REFER TO FIVE-YEAR REPORTS FOR ADDITIONAL INFORMATION. CAN BE COPIED AND INSERTED FROM THE 5-YEAR REVIEW:**

The Physics Department offers a B.S. and a B.A. degree and the department (like all departments at the university) spent a significant part of the last four years preparing for semester conversion. The full-time faculty, whose teaching loads have gone up nearly 30% since their last 5-Year Review, now numbers 5 (up from 4). It has 36 majors (up from 26 in 2009, which is above average for Physics baccalaureate programs across the US) and the faculty also teach a wide variety of General Education courses/labs. The External reviewer noted that student satisfaction was very high. The faculty, called 'engaged and energetic' by the external reviewer (p. 84), are highly involved in publishing and research and brought in over 2 million dollars in outside funding since the last 5-Year Review.

**3.1 DISCUSS THE STRENGTHS AND ASSETS OF THE PROGRAM WITH RESPECT TO FACULTY, STUDENT SUCCESS, CURRICULUM, PROGRAM ENHANCEMENT, ASSESSMENT PLANS AS WELL AS NOTABLE ACCOMPLISHMENTS.**

The Physics Department has a very active faculty, both in terms of teaching loads and in terms of research and publishing. They have received significant faculty awards that includes grants and other funding. The total dollar amount for these is \$2,177,875 (pp. 11-13) as well as having applied for funding for two other projects that could total nearly \$700,000. Many of the faculty have also received internal grants. The list of publications and other faculty awards is impressive (pp. 14-15) The students in the department have certainly benefitted from such active faculty.

36 Noting that the major has grown from 26 majors to 36, a significant number of these students  
37 have been recognized through various awards and recognitions. It should also be noted that  
38 many of their graduates have gone on to be accepted into Ph.D. and M.S. programs as well as  
39 being employed in their fields and teaching K-12.

40 The faculty have also been highly involved in curriculum and program enhancements. Since the  
41 last 5 Year Review the department has created a new minor in Astronomy (which started in Fall  
42 2018). They revised their B.A. program in order to accommodate students who need to take  
43 remedial math at the beginning of their university education. The students can now take all their  
44 upper-division courses in one year. The Physics minor was streamlined to allow students the  
45 option to minor without having to change their major. Students take physics courses by way of  
46 the majors themselves, majors from other departments (mostly science-related) and, as  
47 mentioned above, through general education offerings. The 5-Year Report also contains  
48 information about program assessment (32-39). Briefly, the department has 6 program learning  
49 outcomes that are aligned to four out of the five Institutional Learning Outcomes. The  
50 Curriculum Map is provided as well as the assessment tools and more importantly, the summary  
51 of the assessment findings (pp. 36-39). Significantly, the 5-Year Review notes the areas that the  
52 department plans on focusing on, based on its assessment results. One goal is to improve the test  
53 scores on nationally-normed exams. It also plans to include more in-class presentations, peer  
54 evaluations and a more systematic approach to problem solving.

### 55 3.2 DESCRIBE THE KEY ISSUES AND/OR CONCERNS THAT WERE 56 CENTRAL TO THE FIVE-YEAR YEAR REVIEW PROCESS AND HOW THE 57 DEPARTMENT/PROGRAM PLANS TO ADDRESS THEM;

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59 There were several key issues and concerns noted in the 5-Year review process. One was the  
60 race/ethnicity of the students and the male/female ratio for their majors. 35% of their majors  
61 were Hispanic and this “quite notable” (p. 46) for the field of physic. It also noted that the ratio  
62 of males/females was 4:1. These low numbers reflect the field of physics and the sciences in  
63 general. The department has hired 3 female faculty members since the last 5-Year review in  
64 hopes to remedy the 4:1 ratio. Another concern is the lack of space, especially for faculty  
65 members. Each of the tenured/tenure-track faculty shares an office with sometimes up to 5  
66 lecturers. Related to lecturers, the report notes that many of the courses are taught by them (70%  
67 in 2016). The goal is to increase the number of full-time faculty teaching the major courses. The  
68 department has completed four searches in five years since the last review. Another concern is  
69 related to the high teaching loads which directly impacts research output (p. 74). It is hoped that  
70 they can hire at least 2 more tenure-track faculty over the next 5-year review cycle, to help  
71 alleviate these issues. The External Reviewer also noted that the heavy work load and recruiting  
72 new faculty were key issues.

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74 3.3 NOTE THE PROGRAM'S VISION FOR THE NEXT FIVE YEARS AND  
75 WHAT THE PROGRAM HOPES TO ACCOMPLISH.

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77 The 5-Year Report notes several things the Physics Department hopes to accomplish in the next  
78 five years (p. 60). Ten goals are listed, including creating an RTP departmental manual,  
79 incorporate high impact practices and invest in a state-of-the-art lab. The department also plans  
80 on using its assessment results to improve the entire program (p. 40ff). It also plans (and has  
81 been doing for years) to incorporate students into research projects, increase advising for  
82 students (and the External Reviewer notes that this is already a highlight for the department), and  
83 increased efforts in retention and recruitment of students.

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85 3.4 PROVIDE CONCRETE STEPS ON HOW THE PROGRAM PLANS TO  
86 ACHIEVE ITS VISION IN THE NEXT FIVE YEARS.

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89 The 5-Year report give several concrete steps the department plans on doing to achieve its vision.  
90 A significant part of the future for the curriculum (see above, 3.3) is related to the semester  
91 conversion. Along with this is the department's plan on future assessments of its PLOs/ILOs,  
92 plans to increase student success (pp. 70ff), to increase the number of majors to 50 by keeping a  
93 rigorous program, getting students involved in research, and maintaining/enlarging their  
94 recruiting program. The department also plans on asking for new tenure-track hires.

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96 4.0 CAPR RECOMMENDATION(S) FOR CONTINUATION OF THE PROGRAM:

97 Continuation without modification. The Department of Physics meets or exceeds every one of  
98 the rationales given for this category (p.4 of the CAPR Academic Program Review, 16-17).

99 The next 5-year review for Physics is due in the Spring of the 2022-23 academic year.

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