Appendix A: TEMPLATE FOR ANNUAL PROGRAM REPORT REVIEW *(See preceding document for detailed descriptions for each section)*

ANNUAL PROGRAM REPORT

College	College of Science
Department	Physics
Program	Physics
Reporting for Academic Year	2018-2019
Last 5-Year Review	2018
Next 5-Year Review	2023
Department Chair	Erik Helgren
Author of Review	
Date Submitted	Sept. 27, 2019

I. SELF-STUDY *(suggested length of 1-2 pages)*

Five-Year Review Planning Goals

Five Year Plan (2018 – 2023) Summary

The planning goals set forth for the Department of Physics include:

1. **Implement, assess and revise as necessary the semester courses offered by the Physics program.**

2. **Develop a department-specific Retention, Tenure and Promotion (RTP) manual.**

3. **Continue to provide strong General Education and service course offerings.**

4. **Develop a department strategy to support all faculty with incorporating high impact practices, such as research based instructional strategies, into their curriculum.**

5. **Develop and implement a strategic plan to promote sustainable and measured growth in the number of majors in the program.** We specifically wish to target growth in traditionally underserved student populations in the field of Physics and STEM. This strategic plan needs to take into account current and new resources and should also take into account best-practice marketing strategies.

6. **Request the addition of at least two new tenure-track hires.** Tenured/tenure-track (TT) faculty teach major, GE and service courses and we expect growth in all these categories over the coming years. The TT faculty are also needs to provide more research opportunities and hands-on experiential learning for our students**.** Any new approved TT hires need to have a plan to incorporate undergraduate research opportunities and at least one new TT hire needs to be in the field of Astronomy.

7. **Continue to promote and strengthen the Physics seminar series.** This seminar series serves as a means to strategically grow our number of majors but also provide a sense of community among all Physics enthusiasts and everyone interested in science. For instance, the seminar series will be held during the University Hour, but we will need to monitor and assess the impact on attendance and the availability of outside speakers.

8. **Continue to provide undergraduate research experiences for all interested majors, and other STEM majors where possible.**

9. **Invest in upgraded and state-of-the-art laboratory and hands on learning equipment for teaching and research.** Furthermore, the program needs to develop a plan to improve the storage and proper use of lab and demonstration equipment.

10. **Monitor and support the newly designed Astronomy minor to assess the possibility of growth.**

A. Progress Toward Five-Year Review Planning Goals

Report on your progress toward achievement of the 5-Year Plan. Include discussion of problems reaching each goal, revised goals, and any new initiatives taken with respect to each goal.

1. **Implement, assess and revise as necessary the semester courses offered by the Physics program.**

   In the 2019-2020 AY, we will be undergoing re-certification for all of the department's GE area B1 and B3 courses (along with any accompanying overlays). This includes PHYS 104, 105, 106, 107, 108, 115, 125, 126, 135, 138 and 139. This turn-around seems extremely quick as these course were just implemented last year 2018-19, our first year under semesters, and some of these courses have actually not yet been offered/taught under semesters, making it impossible to show that learning outcomes were achieved. However, this gives the department an opportunity to reflect on and revise many of our semester courses.

2. **Develop a department-specific Retention, Tenure and Promotion (RTP) manual.**

   A draft of the Department-specific RTP manual has been circulated to the tenture-track faculty and pending additional comments/edits, we anticipate presenting the document to the College of Science Council of Chairs for approval in the Fall 2019 semester.

3. **Continue to provide strong General Education and service course offerings.**

   As discussed below in section III "DISCUSSION OF PROGRAM DATA" we have seen a decrease in the overall enrollment in Physics GE and the PHYS 125-126 service courses. We will continue to track this trend and work with partners to ensure that we can continue to provide strong GE and service course offerings.

4. **Develop a department strategy to support all faculty with incorporating high impact practices, such as research based instructional strategies, into their curriculum.**

   In order to hold more frequent and useful discussions, we now hold monthly department meeting (as opposed to twice a semester in previous terms). The more frequent meeting have allowed more opportunities to discuss pedagogy and curricular matters with both tenure-track and lecturer faculty in the room.

5. **Develop and implement a strategic plan to promote sustainable and measured growth in the number of majors in the program.**

The number of Physics majors continues to be close to the national average for undergraduate Physics programs. The Physics major continues to be one of the smaller programs on campus. This is neither surprising nor unusual. In fact, in 2016, the average number of upper division students enrolled in Physics programs nationwide, including both B.S. and Ph.D. granting institutions was 34.8 (www.aip.org/statistics). This data is from the 684 institutions, of a total of 750, that reported their data. This average is considerably lower, only 21.3, when considering only the 508 B.S. granting institutions that reported their data. At CSUEB, in Fall 2019, according to "Bay Advisor," our number of upper division students was 33, well over the national average.

However, we still need to make a coherent plan to promote sustainable and measured growth. Within the department discussions have centered on reaching out to local community colleges, e.g., CCC, DVC Los Medanos, Chabot, Ohlone, Las Positas, to the chairs of the Physics departments to advertise the support structures and opportunities we have here at CSUEB.

One area to advertise to local community colleges, is that Dr. Amy Furniss has been named the co-director of the Cal-Bridge, NSF funded mentorship program. This program provides "intrusive" advising for underserved populations of Physics students at all CSU campuses with the goal of increasing the number of diverse students earning Ph.D.s in Physics and Astronomy. This year three more CSUEB students have been selected to the program. Benefits include the weekly mentoring/advising from CSU and UC faculty, up to $10,000 per AY and support in applying for graduate school.

6. **Request the addition of at least two new tenure-track hires.**

We have been allocated one search which we are currently conducting this year, to hopefully bring on board a sixth tenure-track faculty member starting in the Fall of 2020.

7. **Continue to promote and strengthen the Physics seminar series.**

The Spitzer seminar series continues to be very popular with students faculty and staff. The benefactor Rosemary Rodd Sptizer joined us via ZOOM for the presentation of the Spitzer Collee of Science Outstanding Professor award presented to Dr. Derek Kimball on Sept. 6th of this year (2019).

8. **Continue to provide undergraduate research experiences for all interested majors, and other STEM majors where possible.**

- Dr. Kathryn Grimm had three students working for her at CERN in Geneva Switzerland at the large Hadron Collider this past summer 2019. Dr. Grimm has both Physics and other STEM majors working with her year round.

- Dr. Furniss was accompanied to the VERITAS gamma ray observatory in Arizona by five CSUEB students in 2019. She works with both Physics majors and other STEM majors year-round.

- Dr. Kimball continues to lead international dark matter serach collaborations GNOME and CASPER. CSUEB students, both Physics and other STEM majors, work with him year-round in his CSUEB research labs.

- Dr. Ryan Smith mentors Physics and other STEM majors in his research labs her at CSUEB.

9. **Invest in upgraded and state-of-the-art laboratory and hands on learning equipment for teaching and research.**

   We continue to use research to update our advanced lab and lower division lab equipment as needed for improved student learning.

   We have not as yet implemented a department plan for coordinating the department's demonstration equipment.

10. **Monitor and support the newly designed Astronomy minor to assess the possibility of growth.**

    The Astronomy minor has had challenges drawing in students. We will continue to advertise the minor and track the number of students in the years to come.

B. Program Changes and Needs

Report on changes and emerging needs not already discussed above. Include any changes related to SB1440, significant events which have occurred or are imminent, program demand projections, notable changes in resources, retirements/new hires, curricular changes, honors received, etc., and their implications for attaining program goals. Organize your discussion using the following subheadings.

Overview:

The department of Physics continues to provide high-quality teaching for all students in Physics courses as well as extraordinary research opportunities for CSUEB Physics and other majors.

Honors received by faculty:

- In 2018, Dr. Derek Kimball was named a American Physical Society Fellow in the Division of Atomic, Molecular and Optical (AMO) Physics for outstanding contributions to the development of new techniques in atomic magnetometry and their application to fundamental-physics research, including testing the fundamental symmetries of nature and searches for ultralight dark-matter candidates.

- Dr. Erik Helgren has been named the George and Miriam Phillips Outstanding Professor Award for 2018-2019. This recognition exemplifies the department's long-standing commitment to providing quality education for our students. Dr. Derek Kimball was awarded the same prize in 2013. Dr Helgren was also awarded the inaugural 2018-19 CSU Chancellor's Office Faculty Innovative Learning Award (FILA).

Curriculum:

In PHYS 230 – Physical Reasoning and Scientific Writing, we have been exploring having the course co-taught by Jeffra Bussman from the Library to help facilitate literature research aspects of this course. Mechanisms for co-teaching classes seem to be difficult to achieve here at CSUEB.

Students:

Faculty:

For Fall 2018, Spring 2019 and again now for Fall 2019, there have been a myriad of occurrences that have left us short-staffed in regards to tenure-track faculty who typically teach the upper division core Physics major courses (Quantum Mechanics, Electromagnetism, Advanced Labs, etc.) Faculty were full released from teaching due to grant buyout as well as for parental leave. Though the faculty member with grant buyout continues to be very successful in obtaining external funding (which is a great boon to undergraduates working in his research group) I anticipate other faculty likely applying for sabbatical in the coming year or two so that this situation might arise again. However, we anticipate a successful faculty search which would bring our tenure track faculty total to six faculty rather than five, so this should alleviate the 40% reduction in TT faculty in any one term.

Staff:

The Department of Physics shares an Office Manager (ASC I), Jacqueline Adams with the School of Engineering. Mohammad Ali serves as our Equipment Technician (IST II). Both of our staff members are extremely helpful and collegial, always going the extra mile to help our faculty and most importantly students. Mr. Ali has expressed the possibility of retiring in the coming years and it will be very difficult to replace him.

Resources: *(facilities, space, equipment, etc.)*

We are extremely constrained on how many Physics lab course we can offer as service to other departments and for GE B3 purposes.

Prior to the semester conversion, we had anticipated continued growth in the number of lab-based sections we would need to teach for the PHYS 125-126 Algebra-based Introductory Physics sequence as well as the PHYS 135-136-137 Calculus-based Introductory Physics Sequence. The anticipated extra enrollment for the 125-126 was expected from the new Health Science Environmental Safety concentration and the extra enrollment in 135-136-137 was expected from Computer Science majors being required to take part of the sequence as well as overall growth of the School of Engineering.

This anticipated growth would have left us very constrained on our ability to offer the accompanying lab sessions as we only have three lab classrooms for our department. Two of these are dedicated to our lower division labs, i.e., PHYS 125-126 and 135-136-137. The third lab classroom is dedicated to our upper division lab courses (lab equipment needs to remain set-up for the semester for some of the more complex experiments). As such the two lower division lab classrooms would have needed to be booked from Monday through Friday 8:00 a.m. until after 10 p.m. every day. (basically at capacity).

The enrollment increase in the PHYS 135-136-137 series has indeed been observed, but, as discussed below, the enrollment in the PHYS 125-126 did not occur and as such we have some flexibility in our lab classroom scheduling (which was needed this Fall term because we could not schedule Monday labs due to the three Monday holiday situation). However if the enrollments do bounce back or continue to increase, as expected, we will once again be space-constrained on how much we can offer/grow.

Assessment:

Our department assessment coordinator has been dong an outstanding job compiling our assessment results and in keeping faculty informed on what assessment tasks they need to be working on each term based on what classes they are teaching. To wit, see the assessment report/data below.

Other: *(e.g., major program modifications)*

We do not anticipate any major program modifications this year.

II. **<u>SUMMARY OF ASSESSMENT</u>** *(suggested length of 1-2 pages)*

A. Program Learning Outcomes (PLO)

List all your PLO in this box. Indicate for each PLO its alignment with one or more institutional learning outcomes (ILO). For example: "PLO 1. Apply advanced computer science theory to computation problems (ILO 2 & 6)."

Physics B.S. Program Learning Objectives:

1. ***Explain*** *the fundamental principles of Physics and be able to apply these core ideas to analyze physical processes (ILO 1)*
2. ***Apply*** *quantitative reasoning and critical thinking to solve complex problems, both theoretical and experimental in nature; (ILO 1)*
3. ***Independently*** *learn new technical subjects and skills; (ILO 1)*
4. ***Design****, construct, assess and troubleshoot experiments, quantitatively analyze the results using appropriate statistical procedures and tests of systematic errors, and draw meaningful conclusions; (ILO 1)*
5. *Effectively discuss scientific ideas, both theoretical and experimental, to diverse audiences through written and oral presentations, both formal and informal; (ILO 2)*
6. *Work professionally, effectively, and inclusively as a member of diverse collaborations to solve problems. (ILO 3 & 4)*

Physics B.A. Program Learning Objectives:

1. *Describe the fundamental principles of Physics and be able to apply these core ideas to analyze physical processes; (ILO 1)*
2. *Use quantitative reasoning and critical thinking to solve problems, both theoretical and experimental in nature; (ILO 1)*
3. *Learn new technical subjects and skills; (ILO 1)*
4. *Construct, assess and troubleshoot experiments, quantitatively analyze the results using appropriate statistical procedures and tests of systematic errors, and draw meaningful conclusions; (ILO 1)*
5. *Effectively explain scientific ideas, both theoretical and experimental, to diverse audiences through written and oral presentations, both formal and informal; (ILO 2)*
6. *Work professionally, effectively, and inclusively as a member of diverse collaborations to solve problems. (ILO 3 & 4)*

The CSUEB Institutional Learning Outcome (ILO) numbers referred to above correspond to the following:

(1) **Thinking and Reasoning:** think critically and creatively and apply analytical and quantitative reasoning to address complex challenges and everyday problems.

(2) **Communication:** communicate ideas, perspectives, and values clearly and persuasively while listening openly to others.

(3) **Diversity:** apply knowledge of diversity and multicultural competencies to promote equity and social justice in our communities.

(4) **Collaboration**: work collaboratively and respectfully as members and leaders of diverse teams and communities.

(5) **Sustainability**: act responsibly and sustainably at local, national, and global levels.

B. Program Learning Outcome(S) Assessed

List the PLO(s) assessed. Provide a brief background on your program's history of assessing the PLO(s) (e.g., annually, first time, part of other assessments, etc.)

Assessment Plan for 2018/2019 Academic Year:

Physics 135 (Fall 2018: Dr. Derek Kimball) – Assessed PLO 1 with the standardized FCI Exam, given both at start and end of the term. This is done annually within the course.

Physics 136 (Spring 2019: Dr. Ryan Smith) - Assessed PLO 1 with the standardized BEMA Exam, given both at start and end of the term. This is done annually within the course.

Physics 230 - (Spring 2019: Dr. Derek Kimball) – Assessed PLO 2 through the grading of standard problem set with department-approved problem solving rubric + (still in development) writing rubric. This is done annually within this course.

Physics 381 (Spring 2019: Dr. Amy Furniss) – Assessed PLO 3 and 5 through the grading of a individual research project using a Physics 381 specific Computational Research Paper Writing Rubric. This is done annually within this course.

Physics 451 (Spring 2019: Dr. Erik Helgren) - Assessed PLO 1 & PLO 2 with the standardized BEMA Exam, given both at start and end of the term. This is done bi-annually within the course, as the course is only offered every two years.

Physics 481 (Spring 2019: Dr. Katy Grimm) – Assessed PLO 1 & PLO 2 with standard ETS exit exam on Introductory Physics and Advanced Physics. Assessed PLO 5 with department-approved oral communication rubric. All of these assessments are done annually within the course.

C. Summary of Assessment Process

Summarize your assessment process briefly using the following sub-headings.

Instrument(s):

We utilize standardized tests (FCI, BEMA and ETS Physics Exam) to assess PLOs 1 and 2. These exams have multiple choice questions on introductory and advanced physics concepts, and are accepted as standard measures of content within the physics field. For example, the Force Concept Inventory (FCI) instrument is designed to assess student understanding of the most basic concepts in Newtonian physics.

This forced-choice instrument has 30 questions and looks at six areas of understanding: kinematics, Newton's First, Second, and Third Laws, the superposition principle, and types of forces (such as gravitation, friction). Each question offers only one correct Newtonian solution, with common-sense distractors (incorrect possible answers) that are based upon student's misconceptions about that topic, gained from interviews. Moreover, the Brief Electricity and Magnetism Assessment (BEMA) assesses what students know about the most basic and central concepts of the calculus-based introductory E&M course. It is comprehensive, covering topics from the Coulomb force law to magnetic induction, but omitting radiation because it is very common for the introductory course not to get that far. It has been used by various instructors in various settings and has been judged an appropriate and fair assessment of introductory E&M by physicists experienced in teaching E&M at various levels. It is not aimed at any particular curriculum but contains only those elements common to all calculus-based introductory courses.

In order to assess PLOs 3 and 5 we have utilized writing and oral presentation rubrics that have been created by CSU East Bay Physics faculty and have been adopted as standard within the Physics Department. The Rubrics allow a scaling of specific measures of quality written problem solutions, written research papers and presentations. The rubrics, each of which is provided to the students as part of the introduction to the assignment, were developed by the physics faculty independently, through a collaborative comparison of assessment criteria utilized within their own grading policies.

Sampling Procedure: *The standardized testing assessments are given to the students in class with scantrons provided. The rubric assessments are applied to the student final presentations and research papers at the end of the term. It is important to note that the students have access to these rubrics ahead of the assignment deadline, but do not have any access to the standardized tests in any form aside from when given during the class meeting.*

Sample Characteristics: *The standardized testing sample is a specific percentage of correct answers at the end of the term as compared to correct answers at the beginning of the term. The overall improvement is used as an assessment of the effectiveness of the teaching methodologies utilized to communicate the specific PLOs.*

Data Collection: *The data is collected on scantron for the standardized tests, and recorded in rubrics launched from Blackboard LMS.*

Data Analysis: *Comparison of improvements in content retention and quality of research papers and presentation are completed from one year to the next year.*

D. Summary of Assessment Results

Main Findings:

Force Concept Inventory (FCI): *Studies have shown that in a traditional, well-taught lecture class, the FCI gain is measured to be around 20% while in a class employing a wide range of active engagement and peer-to-peer instruction techniques, the FCI gain can approach close to 50%.*

For the overall post-test FCI score, the generally acknowledged threshold for understanding the material is an average of about 60%.

In 2018, the Physics 135 students were able to achieve an FCI gain of 45% and a post-test average 58%, indicating relatively successful learning compared to national averages. There is no significant difference compared to recent courses taught by the same instructor between

quarters and semesters. Some relevant factors that have persisted between the relatively successful 2014/15 and 2019 courses are the frequent use of peer-to-peer instruction activities (such as think-pair-share), implementation of weekly quizzes and reviews, and a reduction of material covered (compared to earlier versions of the course) in order to focus more classroom time on core subjects.

	2018	2017	2016	2015	2014	2013	2012	2011
Gain between post- and pre-test:	45	54		45	56	27	30	31
Overall post-test score:	58	61		59	66	47	52	48

Brief Electricity and Magnetism Assessment (BEMA): *Studies have shown that in a traditional, well-taught lecture class, the BEMA gain is measured to be around 20% while in a class employing a wide range of active engagement and peer-to-peer instruction techniques, the gain can be above 30%.*

For the overall post-test BEMA score, the generally acknowledged threshold for understanding the material is an average of about 60%.

Of significant concern is that our students are not meeting these thresholds. As part of our new curriculum, we converted our 1 quarter electromagnetism course (PHYS 1003) into a 1 semester course (PHYS 136), covering the same material but with an extended time to include more active learning, peer-to-peer activities, and review and assessment throughout the course.

The gain in the 2017 course may have be a result of the additional motivation to learn the material/pass the course as the 1003 course would no longer be offered after the quarter conversion. In order to make up for a F in the course, the students would need to make up with a 15 week long semester course.

The gain between post and pre-test in 2018 is of order the same as previous years, despite the course now being a semester long course instead of a quarter long course.

	2018	2017	2016	2015	2014	2013
Gain between post- and pre-test:	15	16	20	22	14	29
Overall post-test score:	46	49	44	42	37	47

Communication Rubric Applied to Final Research Project Presentation in PHYS 381:
ETS Physics Exam: The exam was administered to students within Physics 481 for the first time in Spring 2019. Six students were tested, with scores summarized below.

The students standing as compared to the national average is given for the full test below, and then broken into sub-scores for introductory and advanced physics.

TOTAL TEST		
Scaled Score Range	**Number in Range**	**Percent Below**
200	0	100
195-199	0	100
190-194	0	100
185-189	1	83
180-184	0	83
175-179	0	83
170-174	0	83
165-169	0	83
160-164	0	83
155-159	0	83
150-154	2	50
145-149	0	50
140-144	1	33
135-139	2	0
130-134	0	0
125-129	0	0

	Subscore 1		Subscore 2	
	Introductory Physics		Advanced Physics	
Scaled Score Range	**Number in Range**	**Percent Below**	**Number in Range**	**Percent Below**
100	0	100	0	100
95-99	0	100	0	100
90-94	0	100	0	100
85-89	1	83	0	100
80-84	0	83	1	83
75-79	0	83	0	83
70-74	0	83	0	83
65-69	0	83	0	83
60-64	0	83	1	67
55-59	0	83	0	67
50-54	1	67	1	50
45-49	1	50	1	33
40-44	2	17	0	33
35-39	1	0	0	33
30-34	0	0	2	0

120-124	0	0

25-29	0	0	0	0
20-24	0	0	0	0

Recommendations for Program Improvement: *Continue to bring active learning into the classroom for basic concepts, allowing the student to interact with the material more directly than the traditional lecture-style course allows. As these changes occur, the instructor is advised to note any significant changes to teaching methodology when so that if large change occurs to the gain between post-and pre-test, the reason behind the gain can be isolated.*

Next Step(s) for Closing the Loop:
Continue to assess Physics 135 with FCI and Physics 136 with BEMA every year.
Other Reflections:

E. Assessment Plans for Next Year

- *Physics 135 (Fall 2019) – PLO 1; FCI at start and end*
- *Physics 136 (Spring 2020) – PLO 1;BEMA at start and end*
- *Physics 230 - (Spring 2020) – PLO 2; problem solving rubric + writing rubric*
- *Physics 381 (Spring 2020) – PLO 3 and 5; apply writing rubric to lab write ups*
- *Physics 450 (Fall 2019) - BEMA*
- *Physics 451 (Spring 2020) – PLO 1 and 2; BEMA*
- *Physics 481 (Spring 2020) – PLO 1, 2 with ETS Physics Exam and PLO 5 with rubric assessments of end of term research projects and presentations*

III. DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS *(suggested length of 2 pages)*

Each program should provide a one-page discussion of the program data available through University Dashboard. This discussion should include an analysis of trends and areas of concern. Programs should also include in this discussion requests for additional resources including space and tenure-track hires. Resource requests must be supported by reference to University Dashboard data. Requests for tenure-track hires should indicate the area and rank that the program is requesting to hire. If a program is not requesting resources in that year, indicate that no resources are requested.

A. Discussion of Trends & Reflections

Notable Trends;

The most notable trend in the Department of Physics has been a large surge and then fall –off in the number of FTES over the Quarter to Semester conversion and into this year.

An analysis of our major service courses and Freshmen introductory B1 and B3 offerings indicates that there is significant fall off in both these types of courses since the quarter to semester conversion. The decreased enrollment in the Freshman courses may be in part due to the block scheduling perfomed by advisors for incoming freshmen this year. The decrease in in the Algebra-based Physics sequence PHYS 125-126 has been substantial. One area of concern is that the new semester roadmap for Kinesiology students does not include Physics any more. Under quarters, students interested in earning a Kinesiology degree with the goal of applying for Physical Therapy or Occupational Therapy school, were guided into the algebra-based Physics sequence as this is a requirement for these graduate programs. Analysis of the total student enrollment in PHYS 125, i.e. the start of the year-long sequence in the fall term for the past five years is presented below.

	Total Enrollment	Total Kin. majors	Kin. Majors %
Fall 2015	261	60	23.0
Fall 2016	271	72	26.6
Fall 2017	280	76	27.1
Fall 2018	295	51	17.3
Fall 2019	194	32	16.5

It is clear that the number of Kinesiology majors in the PHYS 125-126 sequence is down , but that drop occurred even under the first semester under the new roadmap for Kinesiology, i.e., Fall 2018, with the large drop in total enrollment not coming until Fall 2019. Thus the reduced number of Kinesiology students is certainly not the only source of attrition in enrollment.

Reflections on Trends and Program Statistics:

Provide your reflections on the trends discussed above and statistics and supplemental information presented in this report.

We have been in discussion with the director of General Education regarding changes in the way advisors will block enroll Freshmen in the Fall of 2020 as compared to 2019. We hope to learn what prevented the advisors from enrolling Freshmen into Physics classes. If however incoming native Freshmen students were steered away from their B1 and B3 requirements in their first year, then perhaps we will see a natural rebound in the enrollments of these classes in this cohort's second year at CSUEB.

We have already reached out to the Chair of Kinesiology to discuss the possibility of including the Physics 125-126 sequence as part of the official roadmap for students interested in earning the Kinesiology degree who are looking towards a graduate degree in Allied Health. There are currently over 1200 Kinesiology majors here at CSUEB, though many are transfer students who would likely not need to take the course. However as the Chair indicated, likely 70% of Kinesiology majors express an interest in Allied Health graduate programs. As such the specific inclusion of the Physics sequence on the Kinesiology roadmap could result in a large increase in our introductory Physics enrollment.

B. Request for Resources *(suggested length of 1 page)*

1. Request for Tenure-Track Hires: provide evidence from trends provided

   We are not requesting a tenure-track hire for the upcoming academic cycle. We are currently have a search underway to hire a new Physics faculty member into our department for the start of the Fall 2020 Academic Year. As per our five-year plan, we had anticipated needing two new hires during the subsequent five years, i.e., 2018 – 2023, so we are happy to be half way there.

2. Request for Other Resources

   Of greatest concern to the Physics Department is the quality of the hands-on lab experience for students both in the introductory Physics courses and the upper division courses. A2E2 fees, in particular the EIRA/ECL and IREE allocations have been used by our department to support the hands-on lab experiences. However, the funding has been sporadic and it is hard to make long-term plans without a consistent funding mechanism. We would strongly encourage that the administration acknowledge the higher cost of lab based curriculum and provide more funding to the college of Science which has a high proportion of laboratory based courses.

   It is also strongly hoped for that the administration try to understand the lengths to which the Physics faculty go in order to “make things work” in the poorly designed and woefully outdated/inadequate Science building. Historically the Science building, along with A&E, was one of the first buildings on campus. The plans were borrowed from another, pre-approved building from another CSU. The building is ill-suited for having offices or research labs for the faculty. The heating is inadequate and there is no air conditioning. Just this past week (September 2019) a student fainted in our lab classroom due to the excessive late-September heat wave that left rooms in the Science building at a stifling 80+ degrees Fahrenheit. We would strongly encourage our administration to make upgrading the Science building, classrooms, offices and lab spaces and the accompanying infrastructure a high priority.