College of San Mateo — Program Review Submission

2014-2015 Instructional Program Review

Program Name: **Physics**
Program Contact: **Locke, David**
Academic Year: **2014-2015**
Status: **Submitted for review**
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1. Description of Program

Provide a brief description of the program and how it supports the college's **College Mission and Diversity Statements**, **Institutional Priorities, 2013/14-2015/16**, **5 in 5 College Strategies, Spring 2011**, and other **Institutional Program Planning** as appropriate.

The Physics department at CSM offers 4 sequences for students. Which sequence a student will take depends on their educational goal and, in the case of students planning to transfer to a 4-year institution, the institution they plan to transfer to. All four sequences support transfer to a 4 year institution, as well as associate degree requirements. Thus, aligning with the Board of Trustees' Core Value of a Student-Centered Mission, as well as College of San Mateo's Mission Statement.

Physics 100 is a stand-alone one-semester course which satisfies the GE requirement of a Physical Science for transfer or Associate's degree.

The Physics 210-220 sequence is designed for students majoring in some field of letters and science. It is required for students planning to enter Medicine, Dentistry, Pharmacy, Optometry, Agriculture, or Forestry.

The Physics 210-211-220-221 sequence is required by some transfer institutions (mainly UC's) for students majoring in fields listed above.

Physics 250-260-270 constitute a three-semester program designed to give students majoring in Engineering, Physics or Chemistry a thorough foundation in the fundamentals of physics.

The department also offers a preparation course, Physics 150, which is designed to get underprepared students ready for the Physics 210-220 and 250-260-270 sequences.

In addition, a three-course sequence, Phys 126-127-128 (cross-listed as BIOL 126-127-128) was added for students interested in careers in science education. These one-unit courses were developed as part of the Aurora project, which in turn is part of the CalTeach project. Each class is limited to a maximum of six students, due to funding for the stipends that students receive. Currently, one physics faculty member and one biology faculty member each get one unit of load for all three courses. These courses are, but probably should not be given the special nature and history of the courses, included in the LOAD calculations for the physics department. They typically carry LOADs well below 100.

Beginning in Fall 2012, the department offered an Honors Seminar, Phys 329, in coordination with the other programs in the Math/Science Division. This is in support of the 5 in 5 College Strategies. The offering of Phys 329 which enrolled very few students, also contributed to a low LOAD in physics in the 2012-13 academic year.

Beginning in the Spring 2014 semester, the department is offering some of its classes online with the goal of achieving further access to students and avoiding conflicts in their class schedules.

Beginning in the 2015-16 academic year, the department will offer two of its lecture/lab courses as web-assisted with online lecture and on-campus lab. In both cases, offering the web-assisted course will allow us to increase access to both day and evening students while continuing to increase LOAD. In the Fall, we will offer Physics 270 as a double section with online lecture and one section having a day lab, the other having an evening lab. This will allow us to offer Physics 270 as an evening course within the district. We will do the same with Physics 220 in the Spring, allowing both our day and evening Fall 210 students to continue into the second semester course.

2. Student Learning and Program Data

A. Discuss Student Learning Outcomes Assessment

1. Reflect on recent SLO assessment results for courses offered by the program. Identify trends and discuss areas in need of improvement.

Physics offers two degree options which require the same Physics courses (250-260-270), an AS and an AS-T. Seven students completed the online degree application and the Self-Assessment survey between Summer 2012 and Spring 2014. All seven students agreed or strongly agreed with the first two of the three Likert scale questions they were asked, while 6 out of 7 students agreed or strongly agreed with the third question:

Based on my experiences at CSM, I can...

1. Apply the Laws of Physics to real-world problems
2. Collect and Analyze data to verify physical principles
3. Undertake upper division Physics coursework at a 4-year college

Course level SLO assessment has been useful to the department in identifying what areas students are struggling with in the courses and areas where faculty need to work on time-management in the course. At the course level, many actions have involved further review of topics students struggle with. Since most of our assessments are done by using problems on the course final exam, many topics from the beginning of the course may be forgotten by the end. Review of these throughout the course and at the end of the course has led to improvement. Early on in the department's assessment of SLOs, lack of faculty time management sometimes led to an outcome not being attained by students at all. This has been improved by having faculty more aware of the SLOs for the courses they teach. Some inconclusive results have resulted from the fact that some problems have multiple valid approaches. Students sometimes can correctly solve a problem intended to assess an SLO without demonstrating the outcome. These latter two issues could be remedied by the department drafting common final questions, perhaps three or four per SLO. Faculty could then select which question they would put on their final for SLO assessment. The knowledge of these common questions would help ensure that faculty managed time appropriately. Finding time to develop these questions has been difficult due to lack of full-time faculty in the department. Currently regular full-time faculty accounts for less than 40% of the total FTEF in the department. The physics department hopes to develop these questions in the coming academic year and assess course level SLOs using them in Spring 2016, Fall 2016, and Spring 2017. Fortunately, with the new full-time faculty position we are in the process of hiring for, there will be more time for the department to divide the workload and develop these questions in addition to keeping up with other administrative requirements including curriculum and program review.

2. Comment on the success rates in the program SLOs that are aligned with specific course SLOs. What do the program SLO and course data reveal about students completing the program? Identify trends and discuss areas in need of improvement. Is the alignment between course and program SLOs appropriate and informative? See **course-to-program SLO alignment mapping**.

The program SLOs for both the AS and the AS-T degree are identical as are the physics course requirements are identical for both degrees. As a result the alignment of the three courses required for the degrees are identical. Since success rates of students attaining the course SLOs has been high in assessments of all but one course SLO, we can conclude that these courses are indeed supporting students in attaining the three physics program SLOs.

3. Evaluate the program SLOs in relation to survey data from the degree and certificate award earners survey. What does the survey data reveal about the effectiveness of the program SLOs? Identify trends and discuss areas in need of improvement.

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Based on my experiences at CSM, I can...

1. Apply the Laws of Physics to real-world problems

2. Collect and Analyze data to verify physical principles
3. Undertake upper division Physics coursework at a 4-year college

Though the sample size is quite small, the results indicate that the program is highly effective.

4. Describe any additional methods used to assess program SLOs and reflect on the results of those assessments.

No additional methods are used to assess program SLOs.

One difficulty with developing alternate assessments is that we do not have a capstone course for our degrees, Physics 260 and 270 can be taken in either order. Development of a capstone course cannot be done for the AS-T degree. And, development of a capstone course for the AS degree would likely send our students to other colleges.

A further difficulty is that a student can receive a physics degree from College of San Mateo without ever taking a physics course at CSM. For the AS degree, this is due to the residency requirements being understandably lenient for student completion and the fact that the degree requires more units in mathematics (15 units) than physics (12 units). For the AS-T degree, residency requirements are even more lenient and a student could complete all but 12 GE units outside of the college or district and still receive the degree.

These difficulties can probably be overcome by designing some supplemental questions in Physics 270 that are assessed only for students who are completing 270 after Physics 260.

5. For any courses in the program that satisfy a GE requirement, which GE SLOs are supported or reinforced by the course SLOs? What do assessment results for the course SLOs reveal about student attainment of the GE SLOs? See **GE SLO Alignment Summary Report** or **All Courses GE SLO Alignment Data**.

Both the **GE SLO Alignment Summary Report** and **All Courses GE SLO Alignment Data** reports are inaccurate and do not reflect the alignment entered by discipline faculty in tracdat. All of the courses that satisfy a GE requirement have SLOs that are aligned with the "Effective Communication", "Quantitative Skills", and "Critical Thinking" GE SLOs. Since success rates of students attaining the course SLOs has been high in assessments of all but one course SLO, we can conclude that these courses are indeed supporting students in attaining these three GE SLOs.

B. Student Success Indicators

1. Review **Student Success and Core Program Indicators** and discuss any differences in student success indicators across demographic variables. Also refer to the **College Index** and other relevant sections of the **Educational Master Plan: Update, 2012**, e.g., Student Outcomes and Student Outcomes: Transfer. Basic Skills programs should also refer to **ARCC** data.

Student success and retention in Physics are lower than the college average and are comparable to those in Math. The three years of data provided show a low point in both success and retention for AY1213, but is too little data to indicate a trend.

Percent enrollments in Physics show greater enrollment in Physics by Asian and Filipino students than for the college as a whole. All other groups are underrepresented in Physics courses compared to the college as a whole.

Students identifying as Black, Native American and Pacific Islander have 9 or less enrollments per year in Physics. Not much can be said about retention and success for these students, since the enrollment numbers are so small. These three groups do have the lowest success rates in Math and since every Physics course has a Math prerequisite, students in these groups may not be eligible to enroll in Physics courses. The Physics department may want to work together with the division devise strategies to help bring up enrollments by students in these groups.

The four groups with 30 or more enrollments per year (excluding “other” and “unrecorded”) show cumulative success rates of about 67% for White and 57% for Asian and slightly less than 50% for Hispanic and Filipino. These gaps are fairly large; however, in AY1112 success by Hispanic students was 62.8% statistically the same as the overall 63.4% success rate by all students in Physics and success by Filipino students was 70% exceeding the overall success rate in Physics by 6.6%. Unfortunately, there was a 6.4% overall drop in success from AY1112 to AY1213. The drop is most notable in the Fillipino group, where the drop was from 70% to 30.6%, and in the Hispanic group,

where the drop was from 62.8% to 43.4%. For both of these groups and overall success, there has been an increase from AY1213 to AY1314.

Success and retention seem to be higher for students 19 and under than students 20-29. This may be due to external factors for working students and students with families.

2. Discuss any differences in student success indicators across modes of delivery (on-campus versus distance education). Refer to **Delivery Mode Course Comparison**.

The physics department is offering courses as distance education for the first time this semester. Delivery Mode Comparison will not be done until next year, when data is first available.

C. Program Efficiency Indicators. Do we deliver programs efficiently given our resources?

Summarize trends in program efficiency as indicated in the **Student Success and Core Program Indicators** (LOAD, Full-time and Part-time FTEF, etc.)

Enrollments have increased from AY1112 to AY1314 by 23%, partly due to the expansion of evening course offerings.

LOAD cannot be compared year-to-year in any easy way. The college's accounting for HBA/TBA hours was done differently in different years effecting WSCH generated by HBA/TBA hours by as much as 30%. LOAD in physics is limited by the size of some of the course offerings, most notably the Cal-TEACH courses (126-127-128) and in AY1213 the Honors Seminar (329). Due to enrollment limits in these courses. The combined LOAD in 126-127-128 in the current semester is 23.

LOAD is reduced in Physics by assignments in the Integrated Science Center and in Fall 2012 was reduced by assignments in the Math Resource Center. In Fall 2012, the denominator for calculating LOAD in Physics included FTEF which was assigned to the Math Resource Center. Removing assignments to labs and centers from Fall 2012 results in a LOAD of 460.1, much above the provided 396.6.

Due to the nature of the course offerings in Physics and assignments in the Learning Support Centers, LOAD is not expected to reach 500 for the Physics Department. Physics would like to expand its offerings of double lab sections, which can carry much higher LOADs than single lab sections. This is possible to some extent and the program has seen recent growth. However, there is a large constraint on double section offerings due to the lack of lecture rooms in Building 36. In the coming academic year, we will be offering two double sections in web-assisted format. This avoids the classroom space issue. Also, the department will need to replace retired or retiring faculty to have healthy growth and increase LOAD.

Fall 2009-Fall 2010 FTEF was all generated by Full-Time faculty. This was due to elimination of some sections for budgetary reasons. Beginning in Spring 2011, Professor Locke became the SLO Coordinator at the college. This allowed for some assignments to be given to the department's two adjunct instructors. For Spring 2011-Spring 2012, Full-time FTEF was 80-90% of the total FTEF. In December 2012, Professor Uchida retired after 22.5 years of service in the district. Effective Spring 2013, Professor Uchida became an adjunct instructor. With this retirement, Regular Full-time FTEF dropped to 1.6 and was only 36.6% of the total FTEF (39% was Adjunct FTEF and 24.3% was Overload FTEF). Fortunately, the department has been approved and is in the process of hiring a full-time instructor for Fall 2015. However, Professor Janatpour plans to retire in the next couple of years and the department will need to hire a replacement or Full-Time FTEF will drop below 50% again.

Part-Time FTEF has doubled each year from AY1112 to AY1314. Part-time FTEF is expected to go back down in AY1516 with the new full-time position.

3. Additional Factors

Discuss additional factors as applicable that impact the program, including changes in student populations, state-wide initiatives, transfer requirements, advisory committee recommendations, legal mandates, workforce development and employment opportunities, community needs. See **Institutional Research** as needed.

One external factor effecting student success and retention is the lack of computerized prerequisite checking in the physical science and engineering major's sequence (Physics 250-260-270) and in the first semester of the biological science major's sequence (Physics 210). In 2007, the full-time physics faculty from Canada, CSM, and Skyline met to discuss prerequisites for all physics classes. Although, Canada and CSM came to agreement on prerequisites, the faculty from Skyline asked to consult with the Dean of Science/Mathematics/Technology at Skyline and then follow-up. More than 7 years later, Skyline has neither changed their course numbers nor changed the prerequisites of these courses to agree with what Canada and CSM agreed upon. In the last month, a Skyline physics faculty members has contacted our department for follow-up, more than 7 years later. However, this is too late to make changes for the 2015-16 Catalog Year. We will be following up and hopefully working together as district discipline faculty from Canada, College of San Mateo and Skyline to align our courses to best serve students in the district.

Not having computerized prerequisite checking, not only lowers success and retention rates, but also LOAD. Students who have not met the prerequisites for the course enroll and are not dropped by the system before the semester starts. If these students drop (or are dropped from) the course after the start of the semester, the census enrollment in the classes will be lower. These students will displace eligible students who will look to other colleges to enroll in the course. Thus further impacting the department's LOAD.

4. Planning

A. Results of Program Plans and Actions

Describe results, including measurable outcomes, from plans and actions in recent program reviews.

An evening section of Physics 250 is now offered and the enrollments for Physics 260 and 270 have increased, resulting in a double section of Physics 260 being offered in the Spring now.

B. Program Vision

What is the program's *vision* for sustaining and improving student learning and success over the next three years? Make connections to the **College Mission and Diversity Statements**, **Institutional Priorities, 2013/14-2015/16**, and other **Institutional Program Planning** as appropriate. Address discussion in the Student Learning and Program Data section: SLO assessment results and trends in student success indicators.
[**Note**: Specific plans to be implemented in the next year should be entered in C of the Planning section.
CTE programs must address changes in the context of completion and employment rates, anticipated labor demand, and any overlap with similar programs in the area as noted in D1 and D2 of the Career Technical Education section.]

The Physics Program at College of San Mateo would like to continue offering quality education to students preparing to transfer to 4-year institutions pursuing bachelor degrees in the sciences and engineering. This aligns with the statement from the College Mission, "***College of San Mateo fosters a culture of excellence and success that engages and challenges students*** *through a comprehensive curriculum of basic skills, career and technical programs, and* ***transfer preparation.***" (Emphasis added.) This also aligns with the Institutional Priorities 2 and 3.

The Program would like to increase retention and success in its classes. This aligns with Institutional Priority 1. There are multiple actions being pursued. Making sure students enroll in the correct sequence of courses for their educational goals and complete appropriate prerequisite for the courses they enroll in is essential for student success and retention. The department will begin offering Supplemental Instruction this fall in it's first semester science major courses, Physics 210 and 250. Success and retention in the second and third semester courses, Physics 220, 260 and 270 is much higher than the first semester courses. Any assistance we can provide to promote success in the first semester courses will lead to increased enrollments and LOAD in the advanced courses.

The above will require replacing retiring faculty and expanding student supplemental learning resources through an expansion of tutoring, the hiring of a Physics Program Services Coordinator, and Supplemental Instruction.

The Program would also like to expand access to students, by offering more web-assisted, hybrid and online sections of courses. The Program plans to begin offering Physics 270 once a year (in Fall semesters) with an online lecture and an on-campus lab and also Physics 220 in this format (in Spring semesters). The Program would also like to recreate the Conceptual Physics Lab offering it as a science lab option for transfer students.

1. To guide future faculty and staff development initiatives, describe the professional activities that would be most effective in carrying out the program's vision to improve student learning and success.

Bringing new faculty into the department (4 new adjuncts starting in Fall 2013, 1 full-time starting in Fall 2015) will require training in Moodle, Laboratory and Demonstration Equipment, as well as current initiatives (reading apprenticeship, supplemental instruction) and college procedures.

With new faculty, specifically what training/development will be needed will depend on the background experience of those individuals.

2. To guide future collaboration across student services, learning support centers, and instructional programs, describe the interactions that would help the program to improve student success.

Coordination between the Physics Program, the Integrated Science Center and the Learning Center is needed to expand outside of the classroom opportunities for students enrolled in physics classes through peer tutoring, work with a Physics Program Services Coordinator, and Supplemental Instruction.

3. To guide the **Institutional Planning Budget Committee** (IPBC) in long-range planning, identify any major changes in resource needs anticipated during the next three years. Examples: faculty retirements, equipment obsolescence, space allocation.

See the Resource Requests section below to enter itemized resource requests for next year.
Leave sections blank if no major changes are anticipated.

Faculty

Regular full-time faculty FTEF in physics beginning with Spring 2013 was 1.6 or 39% of total physics FTEF. In Spring 2014, regular full-time faculty FTEF was 1.4 or 34% of total physics FTEF. Fortunately, the department has been approved for and is in the process of hiring a full-time faculty member to begin in Fall 2015.

Within the next couple of years, another physics faculty member will retire. We will need to hire to replace that faculty member or we will have the full-time FTEF again drop below 50%. We anticipate needing to hire a new full-time faculty member to begin either Fall 2016 or Fall 2017.

Equipment and Technology

Science programs will always have an ongoing need to replace laboratory equipment.

Tablet computers for faculty are needed to expand web-assisted, hybrid and online offerings. Faculty tablets would also allow for posting problem solutions that can be “played” with audio and video. The advantage over static solutions is that students can see and hear how the problem is set up and solved. An example (without proper captioning) is posted here **https://www.youtube.com/watch?v=odLWMMkTrvI**.

Instructional Materials

Mathematica is a useful program for creating visuals and animations for use in the classroom. Software licenses for instructor laptops and tablets would be beneficial for student learning. Screen capture software would also be very useful for faculty to have copies of to supplement classroom presentations.

To allow faculty to more quickly caption video (like the example in the previous section), Dragon Naturally Speaking licences are required.

Classified Staff

To increase student success, the physics department would like to enhance the support available to students outside the classroom, as has been done elsewhere in the district. The department would like to hire a Physics Program Services Coordinator to work in the Learning Center and/or Integrated Science Center (perhaps also offering support in a collaborative learning space within the future Emerging/Innovative Technologies Building). The Physics Program Services Coordinator would coordinate expanded physics tutoring and supplemental instruction, develop a program similar to Canada's Physics Jam to help prepare students between semesters for upcoming courses, work with faculty developing content to expand and improve student success in web-assisted, hybrid and online offerings, and serve as an additional resource (like an instructional aide) for student content questions. In the past we have requested this position as an instructional aide, but we believe the expanded duties and responsibilities required exceed that designation.

Facilities

The Science Building was built at a time when enrollments were low. One restriction on growing enrollments in some courses (program efficiency) is the availability of a lecture room in the Science Building. Physics lectures are not portable to a classroom elsewhere on campus. Demonstration equipment is not easy to transport and demonstrations often require compressed air, gas, vacuum or DC power. These services are not built into the lecture rooms outside of the science building. One solution to this is offering more web-assisted and hybrid courses which use filmed and posted demonstrations, thus avoiding the impacted lecture rooms in Building 36. Another solution would be construction of additional lecture room spaces in a second science building or a science building annex. A third solution could be design of collaborative and multipurpose spaces within the new Emerging/Innovative Technologies Building.

The department would like to express its support of creating collaborative, cross-disciplinary work spaces and learning spaces within the new Emerging/Innovative Technologies Building. Students would directly benefit from such work spaces – a “design space” equipped with whiteboards, multi-purpose computer labs, and a “tech shop” to support prototyping – would allow students to work in interdisciplinary teams and extend what they learn in the classroom to more advanced projects. These projects could provide additional Honors Project options for students. Students would be able to gain hands-on experience as they prepare for internships and transfer. Projects could go beyond what is currently possible in a single course – and limited by our lab facilities - making it easier to attract support from and partnerships with local businesses and industry. Faculty is keen to offer special projects to interested and able students. These projects benefits students not just in content learning, but also promote deeper supervised-but-independent learning as well as providing research opportunities. Currently, our ability to offer these special projects is limited by lab and equipment. We would therefore greatly enhance our ability to offer special projects and other student-success centered activities if there are more learning spaces available.

In addition to these project work spaces, there is a great opportunity for a collaborative learning space to allow courses to be taught in a studio, workshop, or Scale-Up (Student-Centered Active Learning Environment with Upside-down Pedagogies) format. The Scale-Up instruction format has been found to improve students' ability to solve problems, increase their conceptual understanding, improve students' attitudes and drastically reduce failure rates (especially for women and minorities - **http://scaleup.ncsu.edu/FAQ/Retention/Failure%20Rates.html**). Although the Scale-Up method was developed specifically for large physics classes, the methods are transferable to other subjects. If a large learning space were incorporated into the new Emerging/Innovative Technologies Building, it could be created in a way to serve multiple small or large classes at different times. Two, three or four individual 36 student spaces could be designed adjacent to each other with movable partitions to allow for a 72 student space. Classes in some departments may work well in 36 student spaces, others may work well in a 72 student space (here I am thinking of double or possibly triple science major classes).

The department therefore very much looks forward to the opportunity of working with faculty in other disciplines to develop the physical and curricular infrastructure that will promote student success and opportunity.

C. Program Plans and Actions to Improve Student Success

Prioritize the plans to be carried out next year to sustain and improve student success. Briefly describe each plan and how it supports the

Institutional Priorities, 2013/14-2015/16. For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

Plan 1

Title:
Increase Student Success in Physics

Description
The Physics Department would like to increase student success in physics, particularly in Physics 210 and 250. To do this, the Department would like to (1) hire a Program Services Coordinator to coordinate physics tutoring, supplemental instruction, develop a program similar to Canada's Physics Jam to help prepare students between semesters for upcoming courses, work with faculty developing content to expand and improve student success in web-assisted, hybrid and online offerings, and be an additional resource (like an instructional aide) for answer student content questions. (Previous program reviews requested this position as an instructional aide.) (2) Expand peer tutoring in the Learning Center. (3) Purchase Faculty Tablet computers to allow instructors to record problem solutions, which can help students develop problem solving skills.

Action(s)	**Completion Date**	**Measurable Outcome(s)**
Hire an Program Services Coordinator and expand peer tutoring in the Learning Center	Spring 2016	Increase in student success in Physics 210 and 250 by 10% by end of Spring 2017.
Purchase 4 Tablet PC's to allow Instructors to record problem solutions	Spring 2016	Increase in percentage of students that correctly solve problems that are used in the assessment of course level SLOs

Plan 2

Title:
Maintain Staffing Levels and Promote Academic Excellence

Description
To continue to offer a high quality education to science and engineering students transferring to 4-year institutions, the Physics

Department needs to replace retiring faculty. One member of the Physics faculty retired effective Jan 2013. A second faculty member plans to retire in the next couple of years. Replacing retiring faculty will also allow members of the Physics Department to serve on various institutional committees, thus Enhancing Institutional Dialog (Institutional Priority 5). One hire is occurring for Fall 2015.

Action(s)	Completion Date	Measurable Outcome(s)
Hire one full-time faculty members to start Fall 2016 or 2017 depending on retirement date.	Fall 2016 or 2017	Success and retention rates in physics will not drastically drop.

5. Resource Requests

Itemized Resource Requests

List the resources needed for ongoing program operation.

Faculty

NOTE: To make a faculty position request, complete **Full-time Faculty Position Request Form** and notify your Dean. This request is separate from the program review.

Full-time faculty requests	Number of positions
Physics Faculty	1 for Fall 2016 or 2017

Equipment and Technology

Description	Cost (with tax and shipping estimate)

Pasco string vibrators (8 @ $89 each to replace old equipment)	$820
4 Surface Pro 3 - 512 GB/Intel i7 @ $1949 each 4 Docking Stations for Surface Pro 3 @ $199.99 each 4 Surface Mini DisplayPort to VGA Adapter @ $39.99 each	$9566
Vernier Motion Encoder Upgrade Kits (10 @ $145 each)	$1450
Vernier Motion Encoder Cart and Reciever (6 @ $229 each)	$1374
Nada Scientific: Electrostatic Field Apparatus. (1 @ $1319)	$1520
Nada Scientific: Magnetic Levitation track. (1 @ $1690)	$1950
Sargent Welch: Air Table (1 @ $611)	$705
Pasco: Sine Wave Generator (8 @ $259)	$2390
Seagate Backup Plus 5TB External Hard Drive (2 @ $139.99 each)	$322

Instructional Material

Description	Cost
Mathematica Premier Service Plus renewal (2 @ $135 each)	$270
Net Support School Classroom Management Software Annual Maintenance Plan (26 licences @ $7.65 - 15% discount)	$169.06
Dragon Naturally Speaking (4 Licenses @ $149.99 each)	$599.96

Classified Staff

Description	Cost (estimate)
Physics Program Services Coordinator $55,440 + estimated benefits	$65,440
Peer Tutoring (additional 6 hrs per week, 43 weeks per year)	$2,580

Facilities

For immediate or routine facilities requests, submit a CSM Facility Project Request Form.

Description	Cost
Replace black shades with off-white in Building 36 for energy savings and student/faculty/staff comfort.	
Replace electronic flushing toilets and urinals with manual flushing in Building 36 for health and safety. When power is out, current toilets and urinals cannot be flushed.	

6. Program Maintenance

A. Course Outline Updates

Review the **course outline update record**. List the courses that will be updated in the next academic year. For each course that will be updated, provide a faculty contact and the planned submission month. See the **Committee on Instruction website** for **course submission instructions**. Contact your division's **COI representatives** if you have questions about submission deadlines.

Career and Technical Education courses must be updated every two years.

Courses to be updated	Faculty contact	Submission month
Physics 150	David Locke	October
Physics 210	David Locke	October
Physics 260	David Locke	October

B. Website Review

Review the program's website(s) annually and update as needed.

Faculty contact(s)	Date of next review/update
David Locke	15 June 2015

C. SLO Assessment Contacts

Faculty contact(s)	Date of next review/update
David Locke	1 July 2015