## I. Team Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Member Type</th>
<th>Email</th>
<th>Contact</th>
<th>Responsible for what part</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colleen Marlow</td>
<td>Team Member</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrick Kelly</td>
<td>Primary Team Member</td>
<td><a href="mailto:patrick.kelly@marin.edu">patrick.kelly@marin.edu</a></td>
<td>7516</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

## II. Program Review Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Committee (Chairs)</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris Schultz</td>
<td>Curriculum Committee Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blaze Woodlief</td>
<td>Educational Planning Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-Anne Chernock and Erik Dunmire</td>
<td>Planning and Resource Allocation Committee Co-Chairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yolanda Bellisimo</td>
<td>Planning and Resource Allocation Committee Co-Chair/Academic Senate President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nick Chang</td>
<td>Planning and Resource Allocation Committee Co-Chair/Instructional Equipment Committee Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sara McKinnon and Becky Brown</td>
<td>Program Review Committee Chair and SLO Coordinators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chris Schulz</td>
<td>Student Access and Success Committee Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michael Irvine</td>
<td>Tech Committee Chair</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## III. Vice President of Academic Affairs

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nick Chang</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## IV. Board of Trustees President

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eva Long</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Program Overview—Introduction

Physics-2009

Instructions: Use this form to quickly outline your program at College of Marin. Briefly answer each of the questions and use bullet points whenever possible. Provide any attachments that substantiate or expand on the questions below.

I. Program Definition
Outline the unique qualities that define the importance of your program.

Science can be divided into three main categories, Chemistry, Physics and Biology. We have strong chemistry and biology at CoM. We need help in physics as outlined in this program review.

Physics attempts to understand and analyze the natural world and is part of the Physical Sciences Program. It is an essential part of transfer majors in both Physical, Life and Earth Sciences as well as Engineering.

II. Program Purpose
Pathway:
Briefly describe how your program fits into the pathways you have chosen.

Physics primarily serves students preparing for transfer to four year universities in the Physical Sciences and Engineering as well as some Life Sciences and Architecture. Physics also serves General Education needs in Physical Science. Many students already holding degrees also have to take physics in order to attend medical or dental school. Most of the students taking chemistry and many of those taking life science classes also need to take physics, and yet the enrollment are not commensurate with these other programs. This can mostly be attributed to the lack of a full time instructor who can take the lead and rebuild the program as well as the lack of any real funding for modern equipment. In short, CoM physics has a BAD reputation and it will take investment on the part of both faculty and the district to turn that around!

III. Students Served
Briefly outline what students are served in your program.

One group is those students planning to transfer to four year universities in the physical sciences, engineering, life sciences and architecture. The other group is students seeking GE science credit for liberal arts transfers and A.S. or A.A. degrees.

IV. Program History
Briefly outline the recent history of your program.

Physics has suffered from long years of neglect and under funding. This has been a major contributor to decreasing enrollment in Physics over the last two decades. A full time PHYS/ASTRO lab technician has been hired and there was a one-time grant from the Instruction Equipment Committee. Four full time faculty have retired from COM and only one was hired. He subsequently resigned after three years. For the fall 2004 year there were no full time faculty in Physics or Astronomy and enrollments began to go down, as did the cohesiveness of the discipline. Now in fall 2008 we are again faced with NO FULL TIME INSTRUCTOR. Recently we have begun changing the format of our labs from 'Open Lab' to 'Traditional Lab'. Open Lab had the students doing labs on a drop-in basis with purposely vague objects to maximize student creativity. This works well for the best and brightest students but leaves many students feeling overwhelmed and under served. Traditional Lab affords a better learning environment for most students due to the defined structure and availability of expert help. Continued survival of the discipline however requires immediate investment in laboratory equipment and supplies to continue offering a quality experience in the new traditional lab format. For years the physics discipline did not have any equipment budget, and a VERY SMALL supply budget. It goes without saying that much of the equipment involved in the physics laboratory is fairly expensive and the lack of funding over the years has
really taken a toll. By the fall of 2004 many of the classes offered only performed 4 lab experiments per semester (standard at most schools is anywhere from 12 to 15!!). Working with some of the part timers and with the great help of J (the lab tech) we have developed a plan to bring all physics classes up to a minimum of 12 labs experiments with a maximum of 5 students per lab station. Last year an accounting of current and needed equipment to achieve the above stated goal. We put together a list of equipment that would bring the physics labs into the modern era, afford a full compliment of labs for each class with an adequate number of lab stations for current enrollments. The total cost was....HUGE. So instead of asking for the total amount, we have developed a long range plan to rebuild the discipline. This plan includes one time equipment purchases (as shown in the IE portion of this PR) as well as requesting a new roll over budget of maintenance and repairs. If anyone were to walk into the physics store room you would see literally thousands of dollars worth of equipment that has fallen into disrepair. This, for the simple reason that there has never been any budget allocation to keep the equipment in good working order. This must change if the program is to survive, let alone grow.

Attachments:
List and briefly describe any attachments
Instructional Equipment
Physics-2009

This section will be filled out by faculty and reviewed by the Department Chair, the Area Dean, the Instructional Equipment Committee, IPC and Budget. Please enter items that will be used over a period of semesters BY STUDENTS. (Note: These should be NEW items that you are requesting one time only—not ongoing or consumable. Ongoing and consumable requests go under "Other Instructional Equipment". Technology-related requests should go under "Technology Requests".

Select whether the item is less than or more than $200 each. If you are a large discipline with several areas, please include which area this item is for. Include Tax, Shipping and Handling in the total cost for each item.

I. Instructional Equipment/Materials Requirements

<table>
<thead>
<tr>
<th>Priority</th>
<th>To Support</th>
<th>Category</th>
<th>Discipline Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>4 Classes</td>
<td>Over $200 Each</td>
<td>Physics</td>
</tr>
</tbody>
</table>

Description and part number for ordering:

Physics Lab Station. This is composed of the following parts. $16000 Pasco Custom Laboratory Station $40 Metric vernier caliper: http://www.amazon.com/150mm-METRIC-0-02mm-VERNIER-CALIPER/dp/B000YBGMNO/ref=sr_1_5?ie=UTF8&s=hi&qid=1261712197&sr=1-5 $750 CP24484-00 CENCO Ball Bearing Rotating Support Kit, Complete Kit 450 CP33688-00 Electric Steam Generator $200 WLS68625-51 Decade Capacitance Box $175 WL0809 Precision Inclined Plane $120 CP76408-00 Temperature-Pressure of Gases Apparatus 650 P23530-00 Coulomb and Current Balance $40 WLS78430-20 Table Top Support Rod Clamp $1100 Dell Optiplex 960 Computer $850 NT61-315 HeNe Laser 0.5mW 110V Linear $150 Elenco STPS-1 Spectrum Tube Power Supply $650 FLU289/FVF Multimeter w/ Flukeview $125 01LBX0405 Inductance Decade Box $400 01GFG8255-WB Instek Function Generator Model GFG-8255 $8 7011269 BNC Female to Double Stacking Banana Plug $15 7011296 BNC Male to Double Stacking Banana Plug $11 7011452 BNC Female to Binding Posts Stackable $8.00 3536-01 Overflow Can

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Unit Cost:</th>
<th>Tax:</th>
<th>Shipping:</th>
<th>Total:</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>$22,000.00</td>
<td>$2,100.00</td>
<td>$300.00</td>
<td>$134,400.00</td>
</tr>
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</table>

One-time expenses: (e.g. construction, electrical, installation)

On-going Expenses: (e.g. maintenance, repairs, staffing, and/or upgrades)

Item to be shared with the following Department/Program: (Include any shared expenses)

Engineering.

Do you have space for this equipment? Yes

Justification for Item (See Rating Rubric)

1. Indicate how important this item is to the life of your discipline.
   • 'A' means that your discipline cannot teach your course(s) without the requested equipment.
   • 'B' means that your course(s) would be greatly enhanced with the requested equipment.
   • 'C' means that you would like this piece of equipment for your course(s) but can wait for a future academic year.

B.

This item was requested last year and as a result we received one lab station. Currently we have available to the students six complete lab stations. We have requested up to 6 additional complete stations giving the students 12 complete lab stations. Having 12 would be the ideal, however with 10 or 11 complete stations...
(meaning receiving 4 to 5 more stations) the student's experience would be greatly enhanced. Currently we have 21 to 22 students enrolled in each of the four classes each of these stations would support. As mentioned above we would ideally have twelve stations for these classes so we could support the full capacity of 24 students at the optimum 2 students per station. Our experience is that when there are more than 2 students per station, the third student becomes a spectator obviating the benefit of doing a lab. At four (which is where we are at full class capacity), the hands-on experience of the two excess students is severely compromised. In addition trying to keep the surplus students engaged and focused while other people do the lab diverts instructor time from teaching.

2. Is this equipment required to meet Title 5 and/or Ed Code? If so, how? (Cite code)
Is this equipment required to meet any local, state or federal Health and Safety Code? If so, how? (Cite code)

No.

3. How will the quality of instruction be improved for student learning and success? Is it necessary for students to succeed in a series of courses?
The increased access to the experimental equipment for all students will increase the opportunity for them to strengthen their analytical and quantitative skills as well as given them more space to explore the concepts of physics on their own. In physics, it has been shown time and time again that the method of "learn by doing" has a large positive impact on the student's concept retention. Students will also gain stronger lab skills and confidence with more access to the equipment. All of these traits will benefit them when they transfer as well as in their careers as engineers, physicians etc.
In addition, as mentioned above instructors will have more time for one-on-one instruction during the lab period since they will not have to supervise surplus students.

4. How will access for students be improved? How many students (annually) will benefit from this request? Is it required to accommodate existing students? Would it be vital to attracting new students?
As mentioned above, student access will increase as there will be fewer students per lab station. If 4 new lab stations are provided 8 students per course will benefit, at 4 courses that is 32 total students across the physics program. This will also increase the experience of the pre-existing students as they will not be accommodating the surplus students in there lab experience. This access will definitely attract new students.

5. What student learning or other outcomes are expected? Is it important to the achievement of student goals?
Physics lab gives students experience exploring and manipulating the physical world. It gives them confidence and develops their conceptual understanding of the laws of physics. The conceptual understanding formed from physics lab experience remains with students long after the course is complete. Further more experimtnal experience develops qualtitative observation and analysis skills.
In addition, adequate lab experience helps students acquire lab proficiency. If our students get to Berkeley and demonstrate incompetence in the lab, Berkeley may be less likely to accept our students for transfer.

6. How will these outcomes be measured for future planning? What data or evidence supports your request?
These outcomes will be measured by student satisfaction in the course. Student satisfaction can be measured both by enrollment levels in all of the courses and by satisfaction surveys distributed to the students at the end of the semester.
In addition we will compare student performance across semesters with the additional lab stations and without.
Additional Justification for this item:
Instructional Operating Supplies
Physics-2009

I. Consumable Instructional Operating Supplies
This section will be filled out by faculty and reviewed by the Department Chair, the Area
Dean, the Technology Committee, IPC and Budget.
Note: Please group requests into broad categories of items required to teach a class.
Make ONE entry for each category.
Note: These are generally ongoing costs. One-time items go under Instructional
Equipment.

<table>
<thead>
<tr>
<th>Priority:</th>
<th>To Support:</th>
<th>Discipline Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>8 Classes</td>
<td>physics</td>
</tr>
</tbody>
</table>

Broad Category (for example in Chemistry - "Chemicals")
Experimental Equipment, Measurement Devices and Chemicals

<table>
<thead>
<tr>
<th>Annual Cost</th>
<th>Previous Cost</th>
<th>Amount of Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000.0</td>
<td>0.0</td>
<td>3000.0</td>
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</tbody>
</table>

Type How Long?
Increasing Cost Ongoing/Recurring

Item to be shared with the following Department/Program: (Include any shared expenses)
Engineering, Chemistry

Justification for Item (See Rating Rubric)
1. Indicate how important this item is to the life of your discipline.
   • ‘A’ means that your discipline cannot teach your course(s) without the requested equipment.
   • ‘B’ means that your course(s) would be greatly enhanced with the requested equipment.
   • ‘C’ means that you would like this piece of equipment for your course(s) but can wait for a
     future academic year.
   In addition, how many times have you requested this item, but you have not received it?
   B.
   This money is necessary to keep the physics program operated throughout the year and
   has been requested on annual basis. This annual budget is required to buy equipment
   parts and supplies for small repairs, maintenance and demonstrations.

2. Is it necessary for students to succeed in a series of courses?
Physics, being a science is rooted in experimental observation of the physical
behavior of the world. Therefore a large component necessary to a complete
understanding the concepts and methods of physics is based in the observation of
physical demonstrations and experiments. Demonstrations and experiments are a
necessary component of physics education. In order for COM students to get a complete
education in the subject of physics that will easily translate to 4-yr Universities
and the job front, they need to have the experience of quantitatively observing and
analyzing the physical world, a task which is impossible without certain basic
equipment.

3. How will access for students be improved? How many students (annually) will benefit from
   this request? Is it required to accommodate existing students? Would it be vital to attracting
   new students?

82 students Fall 2009
97 students Spring 2010
In the absence of this money, equipment will be poorly stocked if not inaccessible to
the students for exploration and to the instructor for demonstration, severely compromising the quality of their physics experience at COM. Current students talk to their friends about their experience at COM, encouraging or discouraging prospective students to enroll in our classes. In order to build enrollment and the program, it is necessary to attract students and at the very least provide an adequate experience for existing students.

Yesterday, we used liquid nitrogen to demonstrate the material properties of different phases of matter in the conceptual physics course PHYS 110 ($40 total cost). Afterward, a student said “This is the coolest class.” We typically get one student a semester to convert to physics as a major from the conceptual class.

4. What student learning or other outcomes are expected? Is it important to the achievement of student goals?

Student's conceptual understanding of the physical world is improved by demonstrations and hands on exercises. In addition, using the platform of real-life experimental observation students develop and strengthen both their quantitative and analytical skills, necessary for all topics, physics and beyond. These outcomes will be measured by student's overall performance in future physics and science courses as well as improvement in their analytical and quantitative skills in all courses.

5. How will these outcomes be measured for future planning? What data or evidence supports your request?

We will continue to monitor the number of students who convert to Physics as a major, or enroll in additional physics courses at COM as a result of their experience in the conceptual physics class. In addition, we will administer a survey to students at the end of the semester to determine satisfaction and likelihood of recommending us to their friends. Both of these with the aim to quantify the degree to which we are building the program.
Faculty Members
Physics-2009

I. Program Faculty
List of Faculty Members and Total faculty Units separately for Fall, Spring and Summer

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>MI</th>
<th>Year Retired:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farriss</td>
<td>Wes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grist</td>
<td>Gregory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miller</td>
<td>David</td>
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Status: Shared W/other program(s):
Adjunct, ETCUM N

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<tr>
<th>Summer 2009 TU</th>
<th>Fall 2009 TU</th>
<th>Spring 2010 TU</th>
<th>Reassigned (Total)</th>
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<tbody>
<tr>
<td></td>
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<td>18.000</td>
<td>00.000</td>
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Years of Service: Specialty:
4 Physics and Astronomy.

Leadership: List involvement in committees or other service
Former adviser to the Science Club.

<table>
<thead>
<tr>
<th>Summer 2009 TU</th>
<th>Fall 2009 TU</th>
<th>Spring 2010 TU</th>
<th>Reassigned (Total)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>18.000</td>
<td>00.000</td>
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</tbody>
</table>

Years of Service: Specialty:
5 Physics and Astronomy.

Leadership: List involvement in committees or other service

<table>
<thead>
<tr>
<th>Summer 2009 TU</th>
<th>Fall 2009 TU</th>
<th>Spring 2010 TU</th>
<th>Reassigned (Total)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16.5</td>
<td>00.000</td>
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</table>

Years of Service: Specialty:
List all areas of specialty and/or equivalency

Leadership: List involvement in committees or other service

http://programreview.marin.edu/TUReportFaculty.jsp
List of Faculty Members and Total faculty Units separately for Fall, Spring and Summer

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>MI</th>
<th>Year Retired:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yassa</td>
<td>Sami</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Status: Adjunct, ETCUM N

Shared W/other program(s): N

Summer 2009 TU: 18.00 00.000
Fall 2009 TU: 00.000
Spring 2010 TU: 00.000
Reassigned (Total): 00.000

Years of Service: 4

Specialty: Physics.

Leadership: List involvement in committees or other service

Additional Teaching Unit Requests

III. FT Faculty Needs (Please fill this out ONLY if you are stating a need for new full time faculty in your area.)

1. Please indicate if there are NO FT faculty in your discipline. Please provide data regarding the length of time this discipline has been without a full time instructor.

2. Non-availability of part-time instructors in a subject area. Please provide evidence demonstrating the difficulty in finding part-time instructors to teach in the subject area.

3. RETCUM Faculty: How many FT faculty have retired in the past ten years. How many units are now taught by RETCUM faculty each year?

4. New FT Faculty: How many NEW FT faculty have been hired in past 10 years? Please list each faculty name and the year of employment. If this instructor is shared with another department, please list the equivalent FTE% for your department. Please list instructional equivalencies as necessary and if faculty member was the result of retreat rights.

5. Reduction in department TUs as a result of FT Faculty retirements or other significant causes? Please provide data that illustrates a change in teaching unit allocation as a direct result of FT faculty retirements within your department and how this may change in the coming year(s).

6. Other reasons: Have there been other causes for a reduction in units in your discipline? If so, please explain and provide evidence.

7. Changes in Student Demand: Recent or forthcoming growth as a result of added sections due to enrollment demands. Provide evidence that illustrates the need for additional faculty due to increased student demand such as numbers of sections added and/or courses with waitlist totals showing a need for additional sections. What is the % of FTEF for this increase in units? If there has been a decline in student growth, please explain why.

8. Current of forthcoming changes that illustrate the immediate need of additional FT faculty within this department. Please outline all relevant circumstances that justify the priority of a FT hire in addition to those already outlined above. Consider changes in the field, changes in the job market and
9. **Program Review Findings:** Indicate what trends you identified in your last program review that support the need for full time faculty hires. Tie these to the department and college mission.

10. **Other considerations:** Include such information as matriculation needs, changes in student demand or community and job market needs, response to legislation, or rapid growth of the discipline.

11. **Shared Resources:** If you have requested FT faculty that will be used by more than one department, please indicate here. Please indicate which disciplines and/or departments and the number of combined students/faculty or classes he/she would serve. Please indicate how it will improve access or outcomes and if it is needed for health and safety concerns or required by law.
Non-Instructional Support Staff
Physics-2009

I. Current Support Staff
List of Support Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Purpose :</th>
<th>Hours/Week</th>
<th>To support:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dick Rogers</td>
<td>Lab Tech</td>
<td>24</td>
<td>14</td>
<td>Classes</td>
</tr>
</tbody>
</table>

Leadership: List involvement in committees or other service
We are not exactly sure what Dick does. He is awful nice though.

List of Support Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Purpose :</th>
<th>Hours/Week</th>
<th>To support:</th>
</tr>
</thead>
<tbody>
<tr>
<td>J Robert Dobson</td>
<td>Lab Tech</td>
<td>40</td>
<td>18</td>
<td>Classes</td>
</tr>
</tbody>
</table>

Leadership: List involvement in committees or other service
J has been a great help over the past year. He is into helping students, faculty, and has really stepped up when the department chair (me, PK) asked him about equipment needs and putting together potential new labs. Much of what he does should be done by a full time faculty, but J has taken it on and has never complained. We are very lucky to have him here at CoM!!!

II. Request for additional support staff (clerical, lab tech, IS, comp tech, tutor, etc.)
Program Summary
Physics-2009

Instructions: after reviewing your data and reports from all other sections of your program review, use this form to briefly summarize all of the information you have provided by closing with your concluding remarks (e.g. an executive one-page summary) for your entire program review.

I. Program Excellence (Best Practices)
Please address any of the following areas:
Overall Program structure, contextualized learning/learning communities, reputation of faculty, faculty collaboration, staff, retention and success, how you maintain a supportive environment, how you address issues of diversity, any specific student learning outcomes.

Through much of this PR there was a strong mixture of begging and complaining. The reality is physics at CoM is good. The partime instructors work very hard to provide quality education. That being said, physics and CoM could be GREAT.
So far:
Student success and retention meet or exceed state and COM-wide averages and transfer alumni who return for visits report being well prepared and successful at four universities. Enrollment in Physics is generally on a very small upward trend over a couple years, but is mostly holding steady.

We have a caring, motivated and competent faculty composed completely of part time instructors that have extensive industry experience to complement their teaching experience.

We have a new full time lab technician and some new lab equipment and we have changed to a three hour lab format as of Spring 2008. Together, these have boosted student interest and retention in Physics and allowed the development of better, more challenging labs. We would like to move all of our lab classes to the three hour lab format but will need additional equipment to do so.

II. Program Resources (Responsiveness)
Briefly summarize examples of key resources required for your program to meet or exceed the college goals (as cited in this review).

Laboratory Equipment needs: Physics has suffered from being grossly underfunded for equipment and supplies over the last 20 years. A list of urgently needed equipment has been compiled as part of program review. We need this equipment and supplies to provide a safe, productive learning environment for our students.

Smart Class room needs: We need more smart class rooms to provide a better learning environment.

Staffing: We need to hire a second full time Physics and Astronomy instructor. Full time instructors are more available for students and can do more outreach to local schools, more data collection for documenting student success, etc. Enrollment increased dramatically as more full time faculty were hired in Chemistry.

III. Moving Forward Objectives (Planning)
Please summarize any data-driven coordinated planning has your department done to improve enrollment, student learning, access and success?

Hire a full time member in Physics and Astronomy.

Purchase sufficient equipment and supplies so there will be two to three students per station in Physics labs.

Transfer success: We need to begin tracking both the successful transfer rate as well as achievement of a BS degree by our former students.
We need to develop a more reliable and objective way of measuring student success in advanced Engineering classes at COM.

IV. Assessment of 2008 Program Reviews:
1. What resources have you been granted from your previous program reviews?
2. Please assess how these resources have been used to improve access, learning outcomes and student success in your program?
3. What changes have you implemented based on previous program reviews?
4. What results have you found?

This program review has been an excellent vehicle for taking stock of where our physics program is and where we would like it to be in the future. Our needs and goals are well defined. It will become a living document to be improved as it helps to improve the Physics and Astronomy program at this college. It would not have been possible to complete this document without the tremendous efforts of the Program Review leaders Blaze, Dong, Derek, Sara and Yolanda.

V. Fall 2009 Requests Summary:
1. Please summarize the main requests you have made in this program review in order of your priority starting with the most important one.
2. Summarize briefly why you want each one.
3. Summarize your overall rationale.

VI. Other concluding remarks.
Area Directors and Deans Comments
Physics-2009

1. Please make any comments on the Five Pathways, Student Access and Success, Facilities, Curriculum and SLO sections.

2. Please comment on the instructional equipment requests, technology requests and other instructional materials requests sections. Please comment especially on any specific priorities without which this program cannot function.

3. Please comment on the faculty and staff sections.

4. Please itemize expenses currently covered by external funds that may revert back to general funds.

5. Other comments

This report is accurate in its statement that the discipline of physics at COM has suffered years of neglect and underfunding. Only a meager amount of lottery funds is allocated to physics supplies each fiscal year. Stable and substantial budget lines for supplies and equipment if we are ever able to make the discipline into what it SHOULD be at this institution.