Instructional Equipment

Physics-2011

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.

Importance:
• ‘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?

I. Instructional Equipment/Materials Requirements

<table>
<thead>
<tr>
<th>Importance</th>
<th>Priority</th>
<th>To Support</th>
<th>Discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>01</td>
<td>Annually:</td>
<td>Area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160 Students</td>
<td>Physics</td>
</tr>
</tbody>
</table>

Description and part number for ordering:
An excel file with a major request for new physics equipment has been sent to AS President Sara, McKinnon and Dean Jim Arnold. It will be attached as a hard copy to the printed version of this PR.

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Unit Cost:</th>
<th>Tax:</th>
<th>Shipping: Total:</th>
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<tbody>
<tr>
<td>1</td>
<td>$85,797.40</td>
<td>$8,150.75</td>
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</tr>
</tbody>
</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)

Do you have space for this equipment?

Justification for Item (See Rating Rubric)
1. 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)

An excel file with a major request for new physics equipment has been sent to AS President Sara, McKinnon and Dean Jim Arnold. It will be attached as a hard copy to the printed version of this PR.

There is significant peer reviewed literature showing the importance of carrying out lab experiments and guided inquiries in the sciences. This is of fundamental and utmost importance in physics. There is also significant research suggesting that students working in pairs help to facilitate each others learning experience. The literature does not in any way suggest that working in groups of 4 or 6 or sometimes 8 as we do in the College of Marin physics classes is good for the students. One needs only to walk into one of our physics labs and see two people closely looking at the experiment in progress while others of the group are further back for lack of access.

The physics discipline has been running on empty like this for as long as this department chair has been here and institutional memory suggest that the last massive revamp/purchase of physics equipment happened with the Austin Science Center was built in the early 70s. Also, since we are moving to a new building soon and hiring a new full time instructor we feel it is time to rebuild the labs sections. We have been slowly doing so over many years, so
time instructor we feel it is time to rebuild the labs sections. We have been slowly doing so over many years, so the attached form will take a major swipe are much of what we need. Over the next few years we can continue to build upon what we receive from IE committee money and/or bond money.

We would like to highly and strongly request that if we are unable to get funding for all the items on the list that we be given a possible dollar amount that we can spend. If the IE committee and/or administration lets us know approximately what will be allocated to us we can come up with a detailed equipment list within a day or two. What we really don’t want to have happen is the IE committee just pick and choose among our requested items. We realize this is what the ranking and priority system is for, but given that many of the items listed come as packages, or as interchangeable items that can be used for various lab experiments and across different courses, we would feel more comfortable sitting down as a group in our department and deciding what to do with any money allocated.

It should be noted that all of the items requests should be available for bond money allocation as they are all robust pieces of equipment that will be used in the new building.

2. 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?

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?

4. What student learning or other outcomes are expected? Is it important to the achievement of student goals? How will these outcomes be measured for future planning? What data or evidence supports your request?

5. Additional Justification for this item:
Technology Requests
Part II: Hardware for Lab and Classroom

Physics-2011

I. Technology Requests-Hardware for Lab and Classroom or other student use

This section will be filled out by faculty and reviewed by the Department Chair, the Area Dean, the Technology Committee, IPC and Budget.

Importance:
• ‘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?

<table>
<thead>
<tr>
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<th>Priority</th>
<th>To Support Annually:</th>
<th>Category</th>
<th>Discipline Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>01</td>
<td>200 Students</td>
<td>Computer</td>
<td>Physics</td>
</tr>
</tbody>
</table>

Description and part number for ordering:
Dell XPS L502x - Core i7 2630QM Processor: 2nd Gen Core i7, Intel i7-2630QM / 2 GHz (2.9 GHz) (Quad-Core), Memory: 6 GB / 8 GB (max), Hard Drive: 640 GB - Serial ATA-300 - 7200 rpm Display Type: 15.6 in TFT active matrix

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<thead>
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<th>Unit Cost:</th>
<th>Tax:</th>
<th>Shipping:</th>
<th>Total:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$22,571.00</td>
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</table>

Type
College-wide
Discipline-Specific
New
None
Classroom use

If this is an upgrade or replacement, please briefly describe your existing equipment in terms of age and capability or lack thereof:
We currently have 4 four to five year old computers that are shared at various times by as many as 8 students per computer.

Item to be shared with the following Department/Program: (Include any shared expenses)
Physics, and possibly college level chemistry which would up the number of students benefiting from these to well over 400.

Justification for Item (See Rating Rubric)
1. Is this hardware required to meet Title 5 and/or Ed Code? If so, how? (Cite code)
Is this software required to meet any local, state or federal Health and Safety Code? If so, how? (Cite code)
Currently we have no ability to do the most cutting edge type of physics experiments because of a lack of data acquisition abilities. We do have a number of probes and sensors but the computing power in our physics lab is essentially from the last century. Also with enrollments in physics remaining fairly strong and expected to get larger once we have a new full time person, that fact that we only have 4 computing workstations is fairly absurd. Each computer often has to be shared by up to 6 students at a time. Of course there is no real learning taking place for 3 or 4 of these students at a time given only one can control the keyboard and there is really only space for a couple more to even see the monitor well.

We would like to purchase 24 new laptops to not only allow students better access to the experimental data, concepts and results we are asking them to perform and know, but also because buying laptops instead of desktops will free up much needed space in the new building. As many know, we in the physical sciences have worked hard to develop a schedule in conjunction with math and life and earth that alloows our students to move through the science/math curricula in a timely manner. Because of this our physics labs are spread out on times and days that best fit the students need with respect to a full schedule. That being the case there are times throughout the week when the physics/astro and physics/engg labs will not be in use. By keeping the tables clear we can easier schedule numerous chemistry discussion as well as other courses in these rooms. In fact given the layout of the new labs, with group work tables, they will be ideal for the discussion/group problem solving teaching model that we often use in chemistry. We envision a locked cabinet with the 24 computers that can be used in either lab, then put away at the end leaving the lab tables clear for another course.

2. 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 quality of instruction will be greatly enhanced given that ALL the students will actually be able to learn, not just the alpha student who takes center stage in front of one of the few available computers. I would say these new computers are essential for both the life science/algebra based physics courses as well as the science and engineering, calculus based physics courses.

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?

See above.

4. What student learning or other outcomes are expected? Is it important to the achievement of student goals? How will these outcomes be measured for future planning? What data or evidence supports your request?

Ability to gather and analyze data will be significantly improved by allowing greater, immediate access to collected information.

It is well documented that hands on lab experimentation greatly improves student learning, comprehension and retention.

5. Additional Justification for this item:

I. Technology Requests-Hardware for Lab and Classroom or other student use

This section will be filled out by faculty and reviewed by the Department Chair, the Area Dean, the Technology Committee, IPC and Budget.

Importance:
• '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.
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<tbody>
<tr>
<td>B</td>
<td>01</td>
<td>200 Students</td>
<td>Computer</td>
<td>Physics Engineering</td>
</tr>
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Description and part number for ordering:
Dell Mobile Precision M4600 - Fully Customizable

<table>
<thead>
<tr>
<th>Qty.</th>
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<th>Tax:</th>
<th>Shipping:</th>
<th>Total:</th>
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<tbody>
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<td>$23.00</td>
<td>$0.00</td>
<td>$6,164.00</td>
</tr>
</tbody>
</table>

Type
New

If this is an upgrade or replacement, please briefly describe your existing equipment in terms of age and capability or lack thereof:

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

Justification for Item (See Rating Rubric)
1. Is this hardware required to meet Title 5 and/or Ed Code? If so, how? (Cite code)
Is this software required to meet any local, state or federal Health and Safety Code? If so, how? (Cite code)
Currently we have no ability to do the most cutting edge type of physics experiments because of a lack of data acquisition abilities. Certain probes and sensors that are widely available can only be run on the most powerful type of computers such as these. These computers will greatly enhance the the physics sequence for science and engineering students.

2. 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?
Students will acquire much greater understanding of certain physical phenomena by being able to perform experiments that until now can only be done as thought experiments (we call them dry labs...i.e. we give the data but don't actually do the experiment). These computers will be used throughout the physics 207 series as well as for the majority of ENGG courses, especially materials and circuits.

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?
We have a total of about 200 physics students per year. About 30-45% of these are in the higher level calculus based physics courses.

4. What student learning or other outcomes are expected? Is it important to the achievement of student goals? How will these outcomes be measured for future planning? What data or evidence supports your request?
5. Additional Justification for this item:
Department Chair Comments

Physics-2011

1. Please rank 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.

An excel file with a major request for new physics equipment has been sent to AS President Sara, McKinnon and Dean Jim Arnold. It will be attached as a hard copy to the printed version of this PR.

Also, we have a number of very expensive items requested in our equipment list. The main reasons we are doing this are because: 1) currently we have anywhere from 4 to 8 people trying to perform one lab experiment as a group and it doesn't take a rocket scientist or even a physics major to realize that for some of these students there is going to be very little interaction with the equipment they are supposed to be learning with, 2) no one ever informed us when it was time to use some of the FF&E money to put new, updated equipment into the new building. Since this is the last time we will do PR before moving, we thought it would be a good idea to add these items. We also think it a good idea for someone, anyone, to have thought of this before us, and told us whether this is the correct venue for these requests. The fact that we are to move in less than a year, the budget for next year is going to be approved soon, and there has been no mention of how or when to spend our allotment of equipment money (or even what that allotment is) is just plain irresponsible! So, in order to not miss out as we did last year, we have requested a number of expensive and yet necessary items in both chemistry and physics.

2. Please comment if additional units, faculty, or staff have been requested.

3. Other comments

Have a glorious day!