October 13, 2008

Name of Unit
College of Optical Sciences

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Proposal developed in consultation with students, faculty, and staff of the College of Optical Sciences and discussions with faculty and administrators in the College of Engineering and the College of Science

Units Involved
Part of the proposal involves courses in Electrical and Computer Engineering, Materials Science and Engineering, and Physics in addition to the College of Optical Sciences. The proposal also involves the possible transfer of faculty from the College of Engineering, the College of Science, and the College of Medicine to the College of Optical Sciences.
While the College of Optical Sciences has had 9 budget cuts in 7 years we are financially sound because we have both reduced unnecessary expenses and more importantly we have greatly increased our revenue through many means as described below. Furthermore, Optical Sciences appears to already be structured in a manner which is consistent with the direction the U of A would like to go. We have no departments and we have a cost effective administration which is centralized at the college level. Because we are not hurting like so much of the U of A we feel the most beneficial thing we can do for our transformation plan is to help other portions of the University. We have had group meetings with students, faculty, and staff, as well as many one-on-one meetings, and we have 3 ideas in mind, but as others think about this, more ideas may surface.

Teaching undergraduate courses in physics and math

We currently co-teach 16 courses with electrical and computer engineering, materials science and engineering, and physics and these cross-listed courses work very well. In recent discussions with the head of ECE we identified 7 courses that ECE and Optical Sciences could combine and cross-list to free up some teaching resources. We have identified 16 undergraduate physics courses that we could easily help teach and we are sure there are several undergraduate math courses that we can also help with. This could start as soon as next semester.

Bring in other entrepreneurial faculty and units that are closely aligned with optics

The atmosphere at the College of Optical Sciences is extremely entrepreneurial and we would like to add faculty from other units who want to work in this type of atmosphere. There are many possibilities because optics is involved in so many fields and there are many disciplines that would fit in the College of Optical Sciences. Interested faculty should contact us.

Help spread the entrepreneurial spirit

The real solution for solving the University’s bad financial situation is not in cutting costs because this has been done again and again the past few years and there is little fat left, but rather the solution is to increase revenues. In the College of Optical Sciences we have a strong entrepreneurial spirit that has made it possible for us to increase revenues and grow. Our proposal is that a few of us could work with other units on campus to help them increase their entrepreneurial spirit and revenue. We want to warn you that while we think this has a good chance of success, it will take some time and it will not produce large results over night.

To help convince others to want to work with us we will now describe a little about how we operate and we will give some of our successes.

Our funding model is different from many of the other colleges. We receive little state allocated funds, but we receive a larger rate of overhead return than most colleges. This means our financial condition is more in our own hands and there is a large incentive to increase our outside grants and contracts. Since we get a larger percentage of the overhead return we are able to invest it in the areas that we feel will give the best payoff. I think this is a model that other colleges should use. At least research intensive colleges should be willing to give up state allocated funds for an increased overhead return percentage because this way they should be able to increase revenue over time. The central administration should also be willing to make this tradeoff because as the college’s revenue increases the university’s revenue also increases.

We allow our faculty members to get pay increases if they have sufficient funds from outside grants/contracts to pay the increase. The pay increase is given with the agreement that if at any time the faculty member is not able to pay the increase off his own grants/contracts the compensation goes back to the level it would have been without this increase. This provides a big incentive for the faculty member
to maintain a healthy level of outside grants and contracts. The faculty member, college, and university all benefit from this arrangement.

How well is all this working? The table below shows some performance numbers per tenure/tenure track faculty member for FY08. This last year our grants and contracts increased by 27% and they have more than doubled over the last 5 years. Other items are also shown in the table to show that we know that outside grants and contracts are not the only quantity of importance.

<table>
<thead>
<tr>
<th>Some performance numbers for FY08</th>
<th>Per tenure/tenure track faculty member</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Allocation</td>
<td>$111,193</td>
</tr>
<tr>
<td>Indirect cost earned</td>
<td>$152,693</td>
</tr>
<tr>
<td>New grants/contracts</td>
<td>$745,770</td>
</tr>
<tr>
<td>Graduate students</td>
<td>8.5</td>
</tr>
<tr>
<td>PhD students</td>
<td>6</td>
</tr>
<tr>
<td>Publications in 2007</td>
<td>6.8</td>
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</tbody>
</table>

We also have a distance learning program where we record many of our courses and then students throughout the world, mostly industrial scientists and engineers, take these courses to get either a Certificate in Optical Sciences or a Masters in Optical Sciences. The faculty involved in these distance learning courses share in the revenue so there is an incentive to teach distance learning courses. Again the faculty member, the college, and the university all benefit from this arrangement. The College of Optical Sciences received ABOR approval for the additional fees charged for the distance learning courses which allows the university to include our distance learning students in the state 22:1 calculation.

We have also sold these courses to universities, companies, and individuals in the U.S., China and Europe. Again the faculty member gets a portion of the revenue so there is an incentive to do the additional work associated with the distance learning courses.

We also sell short courses on DVDs and this November we are giving our second group of short courses in Japan. The faculty members involved with the short courses of course get a portion of the revenue so there is an incentive to do the additional work associated with the short courses.

In FY08 the College of Optical Sciences accounted for approximately 1/3 of the utility patent filings for the University and for recent years Optical Sciences is always among the top two colleges (with Medicine), if not the top, for patents filed. While we have not yet made a lot of money on patents, the amount we are making is increasing and we are putting additional effort into patents because of the large potential income we see. The inventors of course share in the revenue so there is a good incentive to do the additional work involved in doing patent disclosures.

We have approximately 50 Industrial Affiliates that support our Academic Program. The income from the Industrial Affiliates Program helps us recruit students, provide student scholarships, pay for student travel to industry conferences, pay for graduate student teaching assistantships, buy optics library material, provide equipment for teaching laboratories, and sponsor senior capstone projects. The meetings with the Industrial Affiliates often leads to research contracts with industry, consulting jobs for faculty, summer jobs for students, and of courses full-time jobs for our graduates. The faculty and staff work hard on this program because there is a good incentive for having a successful program.
During our last five years we have grown our development effort with an emphasis on scholarships for students. We know that to get the best PhD graduate students we have to offer funding to all the PhD students we accept. Most of our MS students also require funding. The University provides good financial aid for most of our undergraduate students, but we know that being able to provide some additional funding to them helps us get the best. Our research grants and contracts support many students, but there is always a need for more student funding. The faculty work very hard in this development effort to get scholarship money because they know this money helps in recruiting the best students available and having the best students is essential to their teaching and research program. By concentrating our development effort on scholarship funds there is a strong incentive for all faculty members to help.

While the TRIF program in optics is run out of the College of Optical Sciences, the College of Engineering, the College of Science, and the College of Medicine are also very much involved with the TRIF optics program. Again, I think that because of our entrepreneurial spirit, the TRIF return on investment (ROI) in FY08 for Optics was 9.4 compared to 5.2 for Bioresearch and 3.8 for Water and Environmental Sustainability. (For sake of completeness, the Biodesign Institute at ASU had an ROI of 3.8.)

Not only has our entrepreneurial spirit enabled us to thrive in a period of decreasing state support, but over the years it has led to several faculty, staff, and students starting companies and several companies setting up facilities in Tucson so they can work with us and hire our graduates. It has enabled the College of Optical Sciences to become internationally known as a leader, and probably the leader, in the world in the field of optical sciences and engineering.

We would like to work with other parts of the University of Arizona that may not have as much entrepreneurial spirit as us to increase their entrepreneurial spirit and hopefully increase their revenue so they are not as dependent upon the ever decreasing state support.
Budget

We could probably teach 3-5 undergraduate classes per semester and the cost savings is whatever the physics department is paying instructors to teach these classes.

Most of our proposal is for increasing revenue instead of reducing expenses. It is hard to estimate how much the revenue would be increased, but it could be a sizeable amount.