Undergraduate Student Survey Summary
This survey was taken by 34 students, with equal contributions from the Sophomore, Junior and Senior classes. 93% of the students that completed the survey rated their overall experience in the undergraduate program good or excellent.

Coursework
The most significantly repeating answers with respect to classes were that OPTI 201 and 202 recitation and lab classes are repetitive and the labs are too easy. Many students suggested combining 201 and 202 and using that extra semester to teach something else. Another overarching trend was the lack of usefulness of the Senior design project due to students not being placed on optics related projects. The majority of the Seniors that responded do not feel prepared for a job in industry, but all of them cite the reason as a lack of internships or work experience, not coursework deficiencies. Most of the students feel like they are prepared for graduate school and almost everyone showed interest in a 5 year undergraduate+masters program.

Academic Programs/Resources
Undergraduate advising quality and the availability/clarity of degree information scored an average of good-adequate performance (3.2/5). The most valued services provided by the academics office are job information and interview coordination and scholarship/fellowship information. Most of the respondents feel that there are sufficient resources available to them to complete their coursework, with the main comments revolving around the out of date software on the computers in the undergraduate lounge and that not all of them are functioning. Industrial Affiliates participation was found to be extremely useful to this group of students, though many of them felt as though they could be better informed of avenues through which to get involved with the preferred methods of interaction being social events and affiliate presentations followed by Q&A sessions.

Recruitment
The majority of current students taking the survey learned about the undergraduate degree in Optical Engineering through outreach events at their high school, word of mouth from family and friends and through the ENGR102 open house. About half of the students came to the University with the intention of entering optics while the other half changed majors during their first three semesters and were motivated by program prestige and subject matter interest. Additional avenues of recruitment that were suggested were more advertisement at the high school level and more visits by the college to high school classes.

Strengths and Weaknesses
Questions 21, 22 and 23 are open ended questions regarding the perceived top strength and weakness of the undergraduate program as well as suggestions for additional services or support. The responses are listed in the next section.

Representative Answers
1. What year are you in the program? (34 answered, 0 skipped)
   35% Sophomores, 35% Juniors, 30% Seniors

2. What track are you pursuing? (34 answered, 0 skipped)
   32% Optics, 35% Opto-electronics, 21% Optical Materials, 12% Opto-mechanics

3. Are there subject areas that you think could be improved? (17 answered, 17 skipped)
201 and 202 recitation and lab are repetitive and the labs are too easy – 30%

Other – 35%

- More quantum mechanics (Senior)
- So far other than my mechanics classes through the AME department I have had no learning in opto-mechanics. I know as much optics and mechanics as I have learned but I do not see much of a connection between the two. The mechanics applications that I do in the classes never have any optics side to them as far as I see. (1st semester Junior)
- The labs implement the concepts covered in lectures with real world application. What I would like to see though is more problem solving application problems, such as real world problems that we as optical engineers would solve in our jobs. (1st semester Sophomore)
- Coding (c or c++). We don't have coding class except a one unit matlab.
- More of the content from elective courses could easily be integrated with topics of study for the required courses.

4. If applicable, do you feel that your senior design project is augmenting your education as an optical engineer? (8 of 10 Seniors answered)

Right amount of usefulness – 38%

Useful enough – 38%

Could be a little more useful – 50%

Not nearly useful enough – 12%

- All of the comments for this question related to not finding the project useful because the student was not on an optics related project.

5. If you are a senior, how prepared do you feel for a job in industry? (8 of 10 Seniors answered)

Very prepared/prepared – 38%

Not very prepared/prepared as possible – 62%

- I should've done an internship and taken more design classes
- Work experience.
- All of the remarks were along these lines.

6. If you are a senior, how prepared do you feel to go to graduate school? (8 of 10 Seniors answered)

Very prepared/prepared – 75%

Not very prepared/prepared as possible – 25%

- More introduction to Quantum Mechanics and Quantum Optics would have been nice
- Experience working in a lab.

7. Would you be interested in a 4 + 1 undergraduate/masters program. (4 years of undergraduate + 1 year for masters, and graduate with a masters degree) (29 answered, 5 skipped)

Very interested – 83%

Somewhat interested – 14%
Not interested – 3%

8. How would you rate the quality of academic advising provided by the academic programs office of the College of Optical Science? (29 answered, 5 skipped)

   Poor – 10%
   Needs some improvement – 28%
   Adequate – 10%
   Good – 38%
   Exceptional – 14%

9. How would you rate the availability, accessibility and clarity of information relating to your degree requirements? (29 answered, 5 skipped)

   Poor – 0%
   Needs some improvement – 17%
   Adequate – 31%
   Good – 35%
   Exceptional – 17%

10. What do you feel are the most valuable services provided by OSC's Academic Programs Office? (28 answered, 6 skipped – more than one answer allowed)

   Job information and interview coordination - 90%
   Scholarship/Fellowship information - 68%
   Events such as picnics and holiday parties – 43%
   Undergraduate student orientation – 18%
   Other (please specify) – 7%
     - Information on associated academic institutions
     - Registration Information and Questions

11. Do you have enough resources to carry out your coursework? (e.g., adequate study space, supplies for laboratory courses, computers, access to course materials, etc.) (29 answered, 5 skipped)

   There are far more academic resources available than I use regularly – 10%
   Everything I have needed has been provided – 76%
   Occasionally there are some useful resources missing – 14%
There are far too few academic resources – 0%

- The computers in the building are not up to date with their design programs, such as Code V, and dated Solidworks.
- Computers in Undergraduate Room, only ONE of the four actually work
- There should be more computers to use in the undergrad room or the Hopf Reading Room. Also the software is all expired on the computers in the Undergrad room

12. How would you rate the usefulness of student participation in the Industrial Affiliates program? (26 answered, 8 skipped)

   Exceptionally useful to participate in – 77%
   Occasionally useful to participate in – 12%
   Participation could be more useful than it currently is – 11%
   Not worth participating in – 0%

13. Do you feel that you have been adequately informed about the avenues of involvement in the Industrial Affiliates program? (29 answered, 5 skipped)

   Not informed – 30%
   Adequately informed – 35%
   Well informed – 35%

14. What would be your preferred mode of interaction with the affiliates during the workshops? (28 answered, 6 skipped)

   Through social events – 46%
   Giving research presentations followed by question/answer sessions - 12%
   Listening to industry presentations followed by question/answer sessions – 32%
   Poster sessions – 4%
   Other (please specify) – 6%

   - All of the above
   - Demos where we can see examples of products they manufacture, so we have more of an understanding of the role the Optical Engineer plays in the design/production.

15. How did you hear about the Bachelor of Science in Optical Science and Engineering program? (28 answered, 6 skipped)

   Outreach at high school – 22%
   Word of mouth – 29%
   ENGR102 – 25%
College research online – 17%

Pima Optical Sciences Summer Program – 7%

16. When did you decide to join the Optical Sciences program? (29 answered, 5 skipped)

   High School – 45%
   Freshman Year – 45%
   Sophomore Year – 10%

17. What were the major factors in your decision to join the program? (28 answered, 6 skipped, multiple answers each)

   Program Prestige – 13
   Interesting subject matter – 13
   Small/unique field – 8
   Job outlook/salary – 6
   Affordable tuition/scholarships available – 4
   Research possibilities available – 4
   Nice Faculty/Staff/facilities – 3
   Small program – 2

18. What other recruitment efforts might the college have made to inform you of this program? (27 answered, 7 skipped, multiple answers each)

   More classroom visits to university physics/engineering classes - 11
   Emails through the University of Arizona or College of Engineering - 4
   More information at the high school level - 25
   Other (please specify) – 1
     • General Alternative Advertisements

19. If you attended the sophomore undergraduate orientation, is there any additional information you would have liked to be included? (6 responses)

   More introduction to research areas within the college.
   Better advertisement more in advance

20. Rate your overall experience as a student in the undergraduate program. (28 answered, 6 skipped)
Excellent - 43%
Good - 50%
Adequate - 7%
Poor - 0%
I’d like to change majors/programs - 0%
Other (please specify) - 0%

21. Can you suggest any changes or new student services needed? (19 responses, some repeats are not listed here)
   - Postings for undergraduate lab work.
   - More active aid in finding jobs and internships either through the college, with professors, and/or with companies. These experiences are essential for undergraduates, but it can be difficult to get started.
   - Ability to register for classes online without having to go to the academic offices would be nice.
   - Offer more classes during both spring and fall instead of alternating semesters to allow for a more flexible 4-year plan. Also, offer some classes during the summer.
   - Have a back-up academic advisor, especially during class registration.
   - motivational speaker, depression hurts
   - Offer more class sections if possible. The optics courses tend to conflict with electives.
   - Technical elective scheduling is not compatible with core courses in some cases.
   - A TA to help students learn Opti 331.
   - Encouraging some better avenues for undergraduates to take advantage of amenities normally offered to graduate students.
   - More information on the Graduate Programs starting in the Junior Year would be nice.
   - No, but the new advisor is orders of magnitude greater than the last.

22. What do you feel is the top strength of the undergraduate program at the College of Optical Sciences? (25 responses)
   - It covers a variety of areas while still being specialized.
   - There seems to be good retention in the college.
   - A tremendous number of social events.
   - Great facilities, equipment, resources
   - small class sizes, community feeling
   - research opportunities at the undergrad level.
   - the hands on lab time each student gets
   - kind staff
   - Mix of Math and Matlab was very nice
   - The knowledge of the professors is one of the best things about the program. Almost all of them have had real world experience and know the ins and outs of everything which I can't say about most of my classes outside of optics.
   - gets you whipped into shape fast. You learn how to prioritize your work
   - It's nice to have a clear roadmap of courses depending on which track you're taking.

23. What do you feel is the top weakness of the undergraduate program at the College of Optical Sciences? (23 responses but many were moved to question 21 for new service requests)
   - Not enough exposure to certain areas of physics, and quantum mechanics.
• Strict 4 year schedule and inflexibility of class scheduling
• Laboratory equipment could be improved.
• Everybody is relatively isolated. I don't know who anybody is without directly searching the directory photos.
• In my one optics class so far, I feel like practical applications are de-emphasized. I would have liked test questions about WHY you would choose to make an optical system a certain way, rather than just crunching numbers all the time. I feel like I'm only learning things that can be put into a computer and the answers will appear, not learning how to actually think about what to do.
• A ton of information to learn in a very short time. There needs to be good tutoring or office hours available, which there usually is, but not always.
• I think the top weakness is a lack of knowledge on campus about the program.
• Some professors have difficulty speaking English effectively.
• I'd like to see more design classes