

PREPARING OPTICS GRADUATES FOR THEIR FIRST JOB IN INDUSTRY

Brij M. Khorana

Center for Applied Optics Studies
Rose-Hulman Institute of Technology
Terre Haute, Indiana 47803, U.S.A.

ABSTRACT

An approach that has proved effective for preparing optics graduates for their first job in the industry, is presented.

A growing number of universities and colleges are offering coursework in optics and optics related fields at the graduate as well as undergraduate level. Some of these are part of degree programs in optics/optics related field, some are a part of a concentration or area minor program in optics and in other cases these courses are just stand alone courses. Some of these courses also have a lab component. Some of the optics graduates go on to pursue doctorate degree and some seek employment in the industry upon completion of their B.S. or M.S. degree. Optical engineering/science is being recognized more and more as a discipline in its own right and the demand in the industry for such graduates has grown and is expected to continue to grow.

The preparation of the optic graduates, based only on coursework, for a job in the industry is considered adequate but can be enhanced substantially by including some experience which is as close as possible to the work experience at a typical first job in the industry. Some of the degree programs achieve this through a "Co-Op program" in which a student spends one/two semesters at the college/university taking courses, followed by a semester as an intern in the industry. Another approach is to provide to the students, while they are in school taking courses, an experience which is similar to what they will encounter at their first job in the industry. We have used this latter approach effectively for our M.S. (Applied Optics) students.

Our Center for Applied Optics Studies works with businesses, industries, and government agencies in helping solve some of their problems. This usually involves developing a new or improved product or process, or doing a feasibility/evaluation study. The M.S. (Applied Optics) students are required to do a thesis and, whenever possible, we have

required them to use one of these problems as the focus of their M.S. thesis project. The following list of Master's thesis of recent graduates provides an indication of the variety and type of problems:

1. "Prototype Right Angle Fiber Optic Connector and Bend Loss of Optical Fibers"
2. "Optical Nondestructive Testing of Metallic Honeycomb Bonding"
3. "Measurements of Static Displacements Using Digital Speckle Pattern Interferometry and Image Processing"
4. "Studies of Wavelength-Dependent Loss Effects in Optical Fiber Components and Sensors"
5. "Lens for Microlithography"
6. "Non-invasive Study of Human Cardiac Cycle Using Holographic Interferometry"
7. "Veiling Glare in the F4111 Image Intensifier"
8. "Characterization of a Heat-Treated Photorefractive Crystal, Barium Titante"
9. "Phase-Conjugate Shear-Interferometer"
10. "Forward Light Scattering from Optical Fibers"

Most of these thesis projects were driven by industrial interaction and involved a close liaison with an engineer/scientist from the organization that had a vested interest in the solution of the problem. Examples of other industrially driven projects where M.S. (Applied Optics) students as well as undergraduate students gained useful experience, though not reflected in the list of thesis, are:

1. Development of a New Brightness Meter for the Paper and Pulp Industry;
2. Feasibility Study and Subsequent Development of a Vision Inspection System.

The progress on many of these projects is measured by the satisfactory completion of well defined milestones on a pre-set project schedule. By

participating in these type of industrially driven projects, the students get exposed to some of the concepts of project management as well.

CONCLUSION

By having the M.S. (Applied Optics) students address industrially driven problems for their Master's theses projects, they gain first hand experience working on the type of a problem that they are likely to encounter at a job in the industry. Based on the feedback we have received from the industrial representatives, this experience has definitely enhanced the student's preparation for their first job in the industry.

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REFERENCES

1. D. J. Schuh II and B. M. Khorana, "Center for Applied Optics Studies: An Investment in Indiana's Future," *SPIE Proceedings of the Conference on International Competitiveness in Advanced Optics and Imaging, Rochester, 1991* (to be published).