

“ESTABLISHING AN OPTICAL COMMUNICATION LABORATORY”

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This is the first time Technical Career Institutes (TCI) has applied for an NSF grant.

Building a brand new, fullyfunctional lab was a monumental task both scientifically and administratively for TCI. For many years, we have only had to modify, expand or duplicate existing labs.

We started by transforming a classroom into a laboratory. We purchased equipment for the optical communications lab, Pasco Complete Optical System, Optel (Optical Communications Kit), and the College provided us with other measurement instrumentation. TCI also provides us with the ability to interface with the outside world and gave us INTERNET and E Mail.

We acquired a complete optical system that would give us exposure to the various topics of geometrical optics and would give students hands-on experience. The OPTEL experiment set made by Pasco includes a complete set of experiments concerning basic communications in fiber optics. However, we are now reaching a point where we have



achieved our initial objectives and are exploring more advanced applications of fiber optics.

We have conducted the following experiments:

- 1) Transmission of a signal through an Optical Fiber.
- 2) Transmission of Analog DC signals over an Optical Fiber.
- 3) Operational parameters of a Fiber optic Pulse Transmitter.
- 4) Transmission of audio-frequency over a Fiber Optic Link.
- 5) Transmission of sound over a fiber optic link.
- 6) Modulation of pulse carrier by a DC level.
- 7) Pulse Amplitude Modulation-its Transition via Fiber Optics.

At the present time we are looking at Digital Communication Theory and working out different experiments, so that the theoretical aspects could be put into a practical visual framework.

We have also started teaching Fiber Optics Communications at TCI. The experiments that have been done and tested by us will reinforce the theory that is taught in class. However, we are planning to reinforce our lab work in Fiber Optics with practical troubleshooting and splicing techniques taught in industry.. This, we believe, will give our students confidence and the rudimentary skills a fiber optics technician requires.

Our basic plan for teaching this course is as follows:

- 1) Basic Geometric Optics and Fiber Optics Principles.
- 2) Experiments in Analog and Digital Communication using Fiber Optics (an important experiment in which the ATTENUATION OF FIBER will be calculated over a short fiber and over a long fiber).
- 3) Troubleshooting and Splicing Techniques

Recently we have undertaken studies for feasibility of Fiber Optic Networks in our college environment. At present we are collecting information on FDDI Communication networks (Fiber Distributed Data Interface) and what material and resources are available. We have not come up with any concrete plan as yet because we have a small budget. However, we are enthusiastic about the prospects of this Fiber Optic Project.