

For the instructor.

This set of lab courses (analog electrical, digital electrical, optics, and fiber optics) was created under a sub contract to Bridgewater State University as part of a ONR award (ONR # N00014-18-1-2890) to MIT.

NOTICE: Safety should always be your top priority. While engaging in any actual or practical experiments or the implementation of any activity or exercise discussed or referenced in these course materials, be certain to learn about and take all necessary and appropriate safety precautions, including, without limitation, abiding by electrical, optical, and laser protocols and wearing any and all appropriate protective coverings and eye protection. Be advised that your engagement in any course, including any actual or practical experiments or the implementation of any activity or exercise discussed or referenced in these course materials, is entirely at your own risk. The authors and owners of these course materials hereby disclaim any and all liability with respect to your engagement in any course, including your participation in any actual or practical experiments or the implementation of any activity or exercise discussed or referenced in these course materials.

The intended audience extends across broad and diverse backgrounds and experiences with math expectations set at the High School level.

Each of the four Bridgewater State University lab courses (analog electronics, digital electronics, optics and fiber optics) is based on aspects of similar lab courses at BSU scaled to the appropriate level.

The BSU labs were meant to mimic settings that an entry-level technician with a High School equivalency degree would meet in the work place.

Efforts were made to keep costs to a minimum. As these are lab courses, these efforts were not always met with success. Analog and Digital electronics lab courses can all be done rather inexpensively using readily available digital multimeters, DC power supplies, function generators, oscilloscopes and analog and digital supplies which can be found from a number of topic specific supply vendors. These tools and supplies are common in the work place so that goal of matching those experiences can be done at smaller overall costs with a bit of homework by the new instructor or more likely these are tools already in place if your department has elementary physics and or engineering labs already in place. However, the goal to match industry setting equipment for optics and fiber optics in the teaching lab course setting is a costlier endeavor. Optical and fiber optics components and instruments are expensive. We built optics and kits using grant funds. Each kit is roughly \$7k (with options per instructor). We had nine kits in total.

Finally, please note that these course materials are copyright and materials which are referenced or linked in the course materials are themselves copyright. We would kindly ask you to respect the rights of the owners of these works and to not copy or reproduce such materials without prior permission. Other materials are open-source or free to use under certain conditions, but such should be carefully verified before use or copying.

E.F. Deveney

Prof. Physics and Photonics & Optical Engineering

edeveney@bridgew.edu.

5/9/22