Syllabus  
PHY 154: Statistical Process Control in Photonics and Automation  
xxx College

Spring 202x

Instructor: xx  
INSTRUCTOR EMAIL: [xxx](mailto:plienard@stonehill.edu)

INSTRUCTOR OFFICE: xxx

OFFICE HOURS: xx

Call: xx-xxx-xxxx (online Zoom Meetings by Appointment)

Catalog Description:

This course focuses on the principles of data analytics, automation, and process control utilizing Data Management SPC Software. These principles will be practiced through exercises, online learning and lab work that will introduce the student to working with Measurement, Quality Systems, Lean Six Sigma, Control Charts, Improvement & Control, 5S Workplace Organization & Team Development & Management.

Prerequisite: PHY 140, 142, 144

Credit hours :x

PHY 154 is a course in the second semester of the Photonics Technician program. This class blends online and in-class learning, with a heavy emphasis on lab skill development. The student will use online course modules which provide video lectures and quizzes that test whether they are ready for lab work. In class, we will have more detailed discussions, demonstrations of techniques and equipment, and plenty of lab bench time. The overall goal of the course is to learn the process of planning and evaluating a fabrication process by use of Statistical Process Control and Quality Control Evaluations.

Student Learning Outcomes: As a result of successful completion of this course the student will be able to

* Quantify and analyze production-process data utilizing SPC Software.
* Continued use of 3D Cad to design parts.
* Use of the 3D Printer for Additive Manufacturing.
* Evaluate parts utilizing measuring devices and inputting measurement data for SPC analysis and control chart data.
* Collect Data utilizing wireless transmission system.

Evaluation: The student will demonstrate learning through online assignments and quizzes and in-class lab assignments utilizing SPC Software. Course grades will be determined by

Discussion Board Questions 20%  
 Weekly Online Assignments & Quizzes 40%

**Final Lab Project**

(3D Design & SPC Evaluation) 40%

Topics covered:

* Data analytics
  + SPC Data collection and analysis
  + Manufacturing Decision making
  + Quality control and production streamlining
  + Data Tests
  + Process Analysis
  + Real Time Analysis
* Automation
  + Goals of automation
  + Fixed automation
  + Programmable automation
  + Flexible automation
  + Additive Manufacturing
  + Automate & Centralize Data Collection
  + Inspection Reports to Measure Process
  + Comprehensive Metrology Collection
* Fabrication tolerance utilizing additive Manufacturing
* 3D Cad Design
* Reduce Scrap Rates
* Improve Customer Relations
* Design Defect Reduction
* Quality Control and Quality Assurance