

NUSOD 2010 Short Course 101 by Joachim Piprek

## **Introduction to Optoelectronic Device Simulation**

**SCOPE:** The course introduces basic theoretical models of optoelectronic devices. Key semiconductor material properties are discussed. Modern laser diodes and photodetectors are analyzed using real-world device examples. Advanced device simulation is demonstrated to provide deep insight into micro- and nano-scale physical processes. Available simulation software is reviewed and strategies for obtaining realistic performance predictions are described.

### **BENEFITS AND LEARNING OBJECTIVES**

This course will enable you to:

- understand the basic principles of optoelectronic device physics
- know key semiconductor material properties and parameters
- design and analyze modern optoelectronic devices
- use advanced device simulation software

### **INTENDED AUDIENCE**

Students, device engineers, and researchers who are interested in a deeper understanding of optoelectronic device principles and in using advanced simulation software for designing and analyzing modern devices.

### **COURSE LEVEL**

Introductory

### **INSTRUCTOR**

Joachim Piprek has been conducting research on physics and simulation of optoelectronic devices for more than 20 years, both in industry and academia. He has taught graduate courses at universities in Germany, Sweden, and in the United States. Dr. Piprek has published three books on optoelectronic devices and he co-chairs two conference in this field.