

Graduate course

Photonic Devices and Circuits

jointly organized by
Chalmers University of Technology and the Royal Institute of Technology

January-April 2004

Aim: The course aims at developing a deep insight into modern photonic devices and circuits through a thorough understanding of the underlying physics.

Form: 32 hours of lectures + home assignments.

Credit units: 8

Topics:

- Optical properties of semiconductor materials
- Diode lasers: steady state characteristics, dynamics, and noise
- Dielectric waveguides, perturbation and coupled mode theory, photonic crystals
- Integrated optics and photonic integrated circuits
- Optical modulators
- Detectors
- Optoelectronic integration

Teachers:

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Schedule:

Lectures are held according to the schedule below, starting week 3. Lectures are held at Chalmers and KTH in parallel. Each lecture is 4 hours with a lunch break (10-12, 13-15).

Lecture	Date and room at Chalmers	Date and room at KTH	Teacher
1. Optical properties of semiconductor materials	14/1, A820	16/1, C32	Anders Larsson, Chalmers
2. Diode lasers: Steady state characteristics	28/1, A804	30/1, C32	Richard Schatz, KTH
3. Diode lasers: Dynamics and noise	11/2, B429	13/2, C32	Richard Schatz, KTH
4. Dielectric waveguides, perturbation and coupled mode theory, photonic crystals	25/2, B429	27/2, C32	Bozena Jaskorzynska, KTH
5. Integrated optics and photonic integrated circuits	8/3, B429	11/3, C32	Lars Thylén, KTH
6. Optical modulators	24/3, B429	26/3, C32	Robert Lewén, KTH
7. Detectors	7/4, B429	5/4, C32	Anders Larsson, Chalmers
8. Optoelectronic integration	21/4, B429	23/4, C32	Urban Westergren, KTH

Literature: Coldren and Corzine, "Diode Lasers and Photonic Integrated Circuits", Wiley, 1995 (ISBN 0-471-11875-3) + additional material handed out at the lectures.

It is the responsibility of the participants to order their own book. Some internet bookstores are listed at:

<http://www.bokfynd.nu/cgi-bin/v2.0/www/nph-se.html/product/0471118753>

Home assignments: At each lecture a number of home assignments will be handed out. Due date is one month after handout.

Requirements: Pass on all home assignments.

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