

## Slide Set: “Broadband Circuits for Optical Fiber Communication”

I developed this slide set for teaching a short course that covers transimpedance amplifiers, main amplifiers, laser drivers, and modulator drivers in the context of optical fiber communication. Usually, the short course is divided into three lectures of 90 minutes each. (Shorter courses are possible by skipping over some slides.) The suggested partitioning of the material into the three lectures is as follows:

- First lecture (slides 1–47): introduction and background material about optical fiber, photodetectors, and receiver fundamentals.
- Second lecture (slides 48–105): transimpedance amplifiers (TIA) and main amplifiers (limiting and AGC amplifier).
- Third lecture (slides 106–141): lasers, modulators, and their respective drivers.

Because of the limited amount of course time, the lectures depend heavily on the accompanying book *Broadband Circuits for Optical Fiber Communication* by E. Säckinger (John Wiley & Sons, New York, 2005; ISBN 0-471-71233-7). Material that is not of primary importance or does not lend itself well to an oral presentation is left out of the course. For example, analog receivers and transmitters (Sections 4.8, 5.2.12, and 8.2.10 in the book), some TIA architectures (Sections 5.2.7 and 5.2.8), limits in optical communication systems (Section 7.4), as well as all the material in the appendices is not covered in the short course. Similarly, mathematical derivations, numerical examples, and product examples (Sections 5.4, 6.5, and 8.4), which are too tedious to present in the course, are left for the student to read in the book. (Slides with product photos were omitted to avoid copyright issues.)

In general, the course is meant to *introduce* the student to the field of broadband circuits for optical fiber communication and *motivate* him or her to read more about the various topics in the book and the literature that is referenced in the book.

The slide set is in PDF format and can be viewed, for example, with the free Adobe Reader. To manipulate the slide set (extract slides, delete slides, etc.) you need Adobe Acrobat. The slide set was created using the tools `idraw` and  $\text{\LaTeX}$ .

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