# Electronics
# EE3C11
## (Introduction)

Rene van Swaaij

Chris Verhoeven

Anton Montagne

Laura Bruns

# Building the “bridge”

Semiconductors

Circuits

**Specifications** come from the top

Hardware comes from the bottom

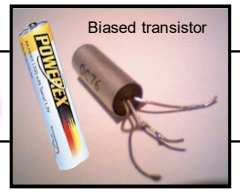
**Show-stoppers** come from the bottom

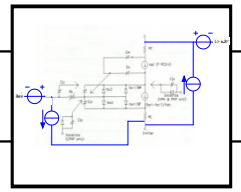
Top-down design

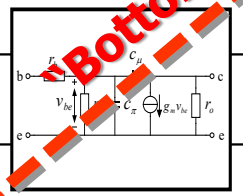
Customer

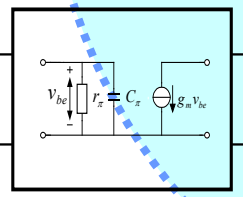
Design Methodology

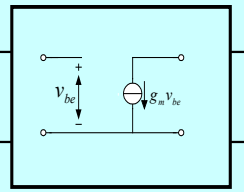
“Bottom-aware top-down design”

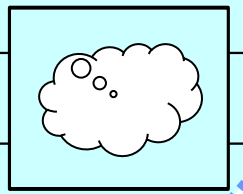


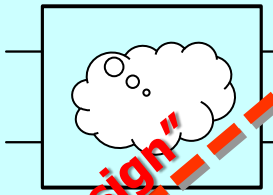



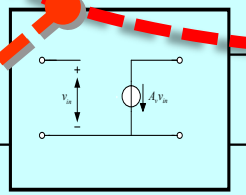


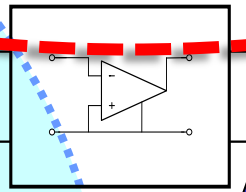




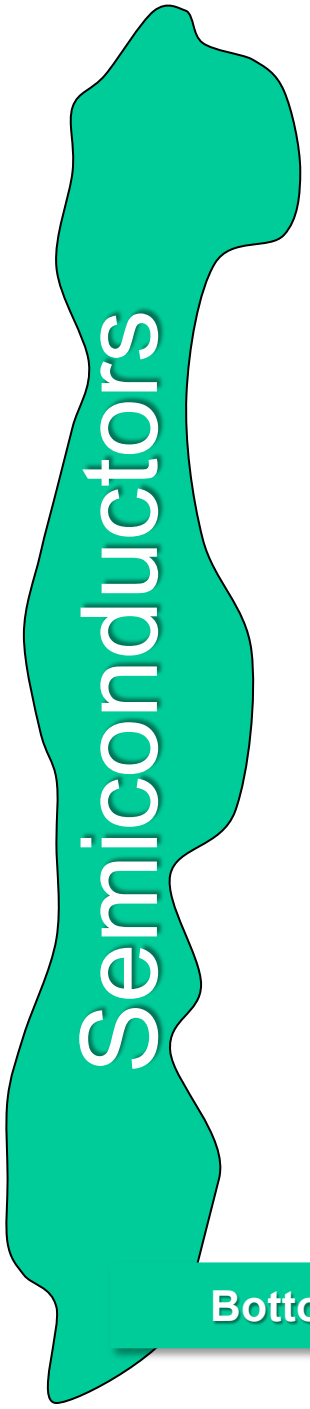








Bottom-up design




# Schedule

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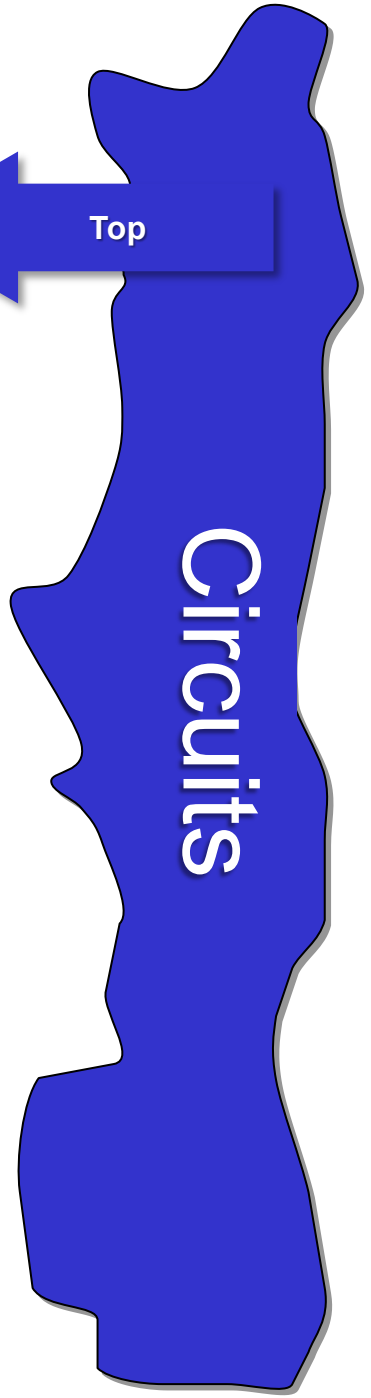
Top

Bottom



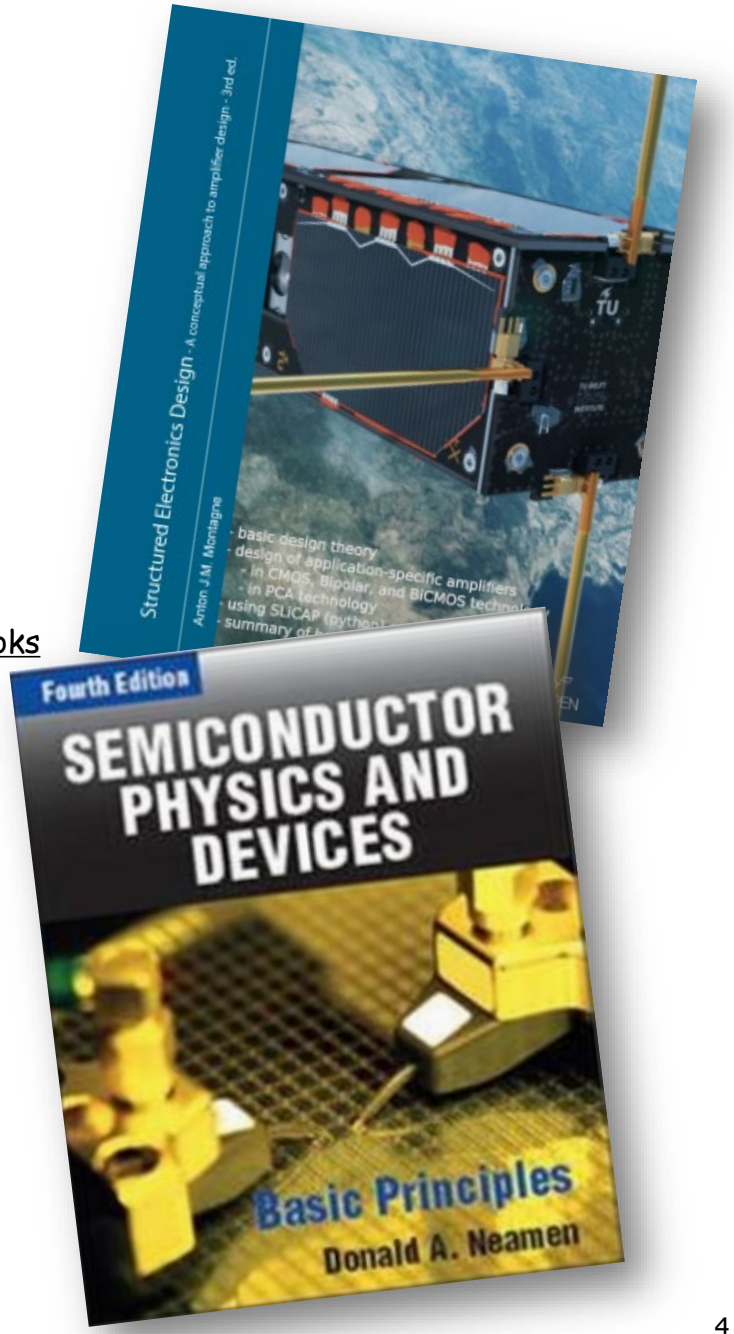
# Books

## *Electronics*

**Structured Electronics Design:**
**A Conceptual Approach to Amplifier Design, 3rd ed.**
*Anton Montagne*

Download PDF or order hardcopy via TU-Delft Open Textbooks

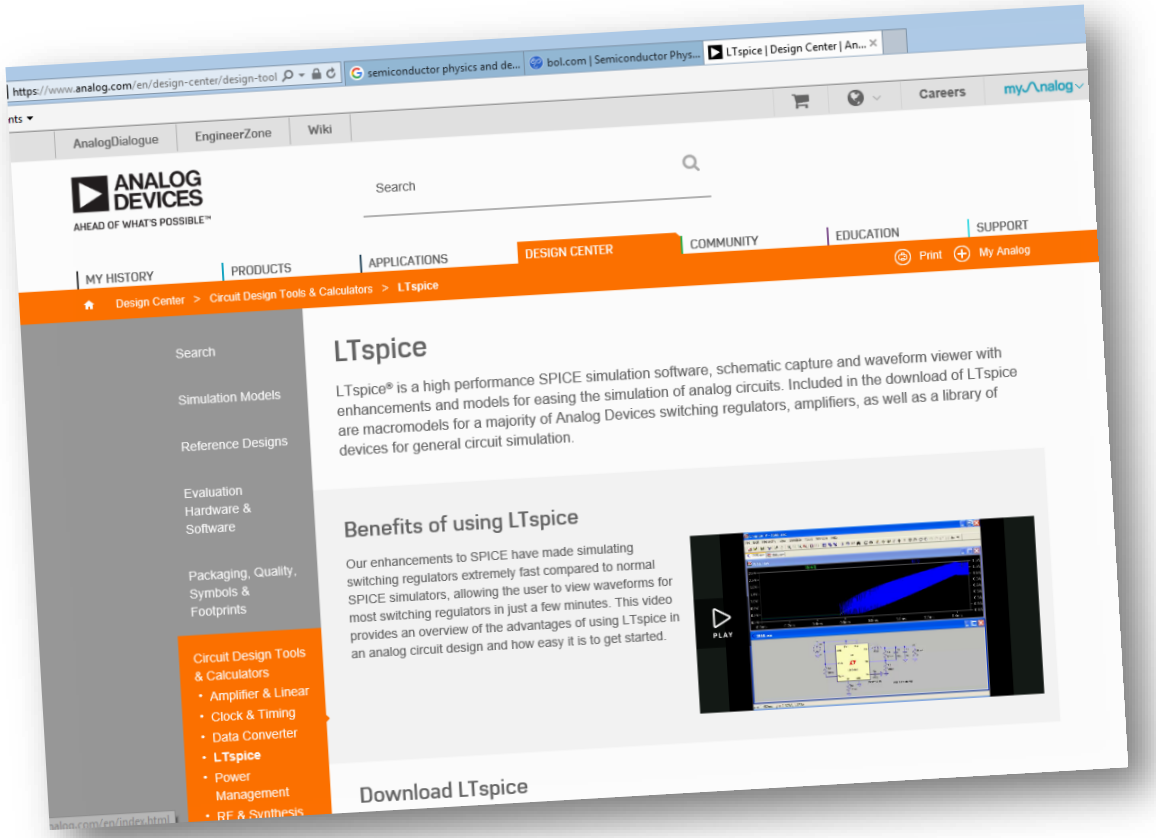
Structured Electronics Design: A Conceptual Approach to Amplifier Design, 3rd ed. | TU Delft OPEN Textbooks



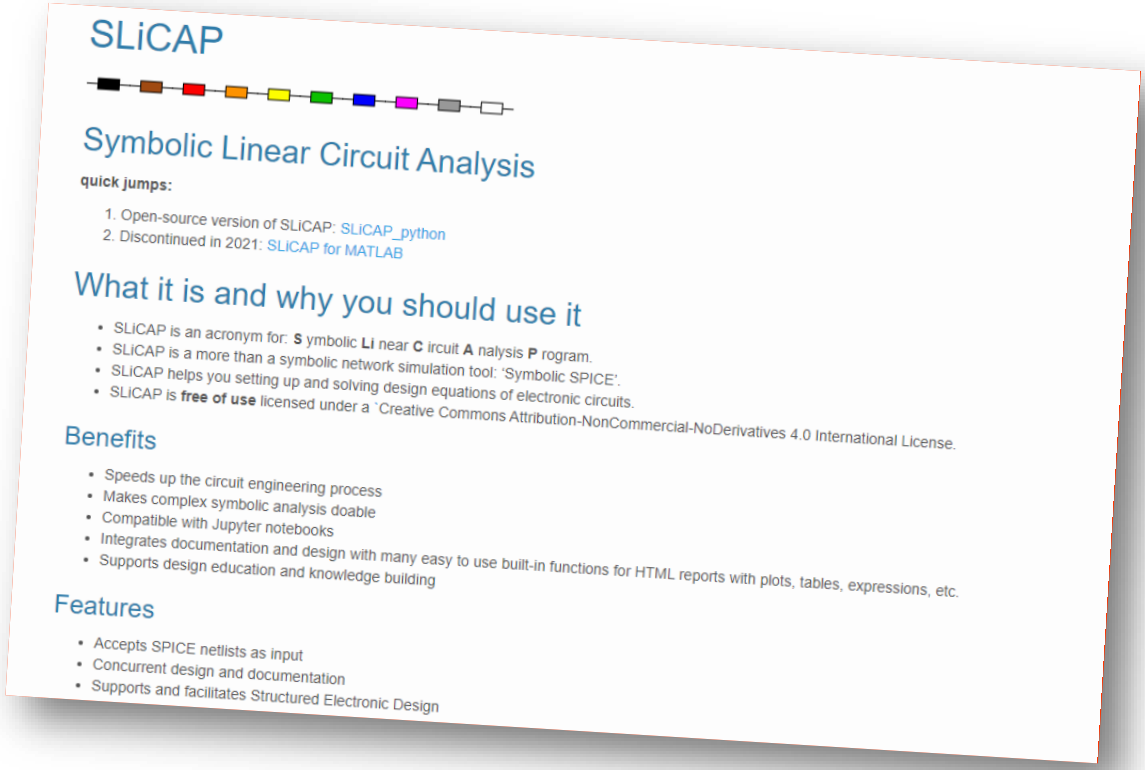

## *Semiconductors*

***Semiconductor Physics and Devices; Basic Principles***
Donald A. Neamen
McGraw-Hill International Edition, (4th edition)

# Software




**LTspice®: Simulation, Schematic capture** and **Waveform viewer**




**SLiCAP : To set up and solve Design Equations** of electronic circuits.

**To create design documentation**

(SLiCAP is a Python application: you need a laptop with e.g. Anaconda)

# Exam

**Multiple choice** + maybe some open questions that need short answers

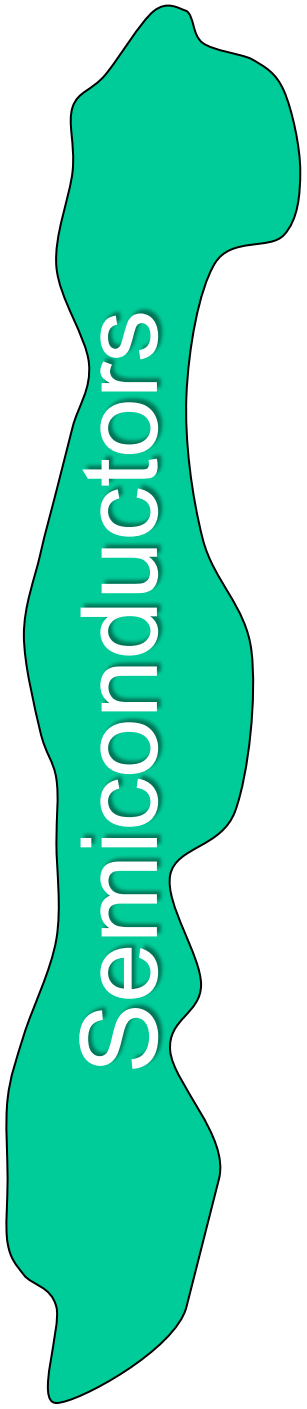
**Two parts**

1) Semiconductor physics
2) Structured Electronics Design (SED)

**Open book** (course books, handouts, and slides)

**SED grade can also be obtained via design assignment**

Team project 4-6 students
Design, build, test, and evaluate results during the lecture period
Assessment via design review
Assessment grade replaces grade for SED part obtained during the exam if higher
(Remains valid for the re-sit)

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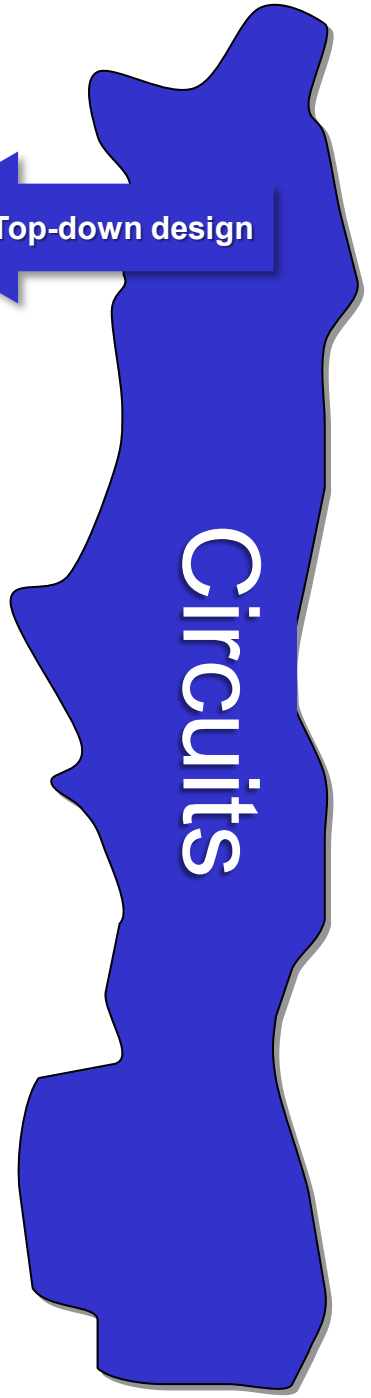
Top-down design



# A

| | | | | |
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# Example

| | | | | |
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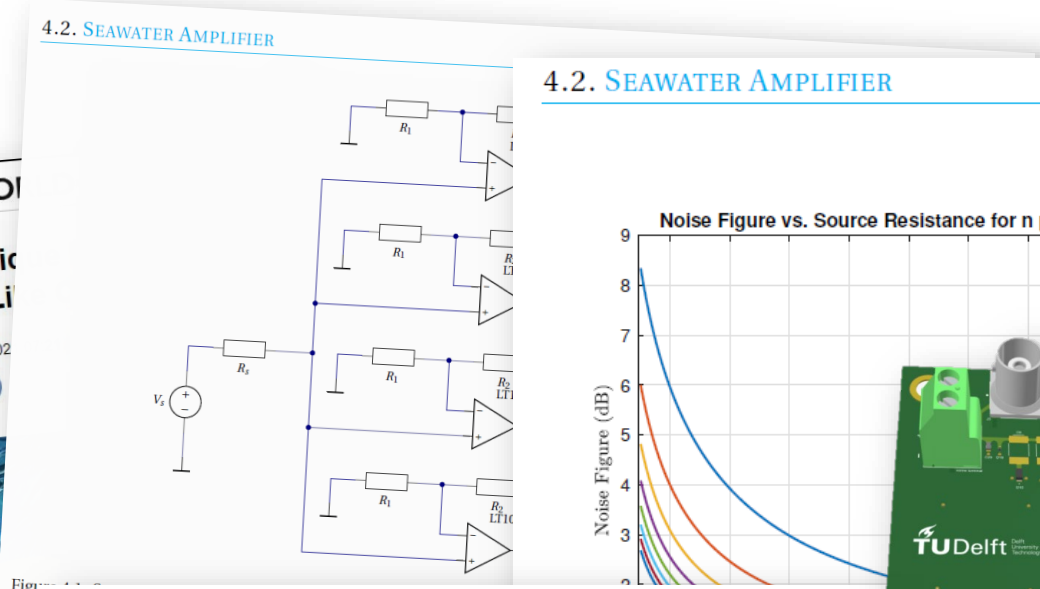
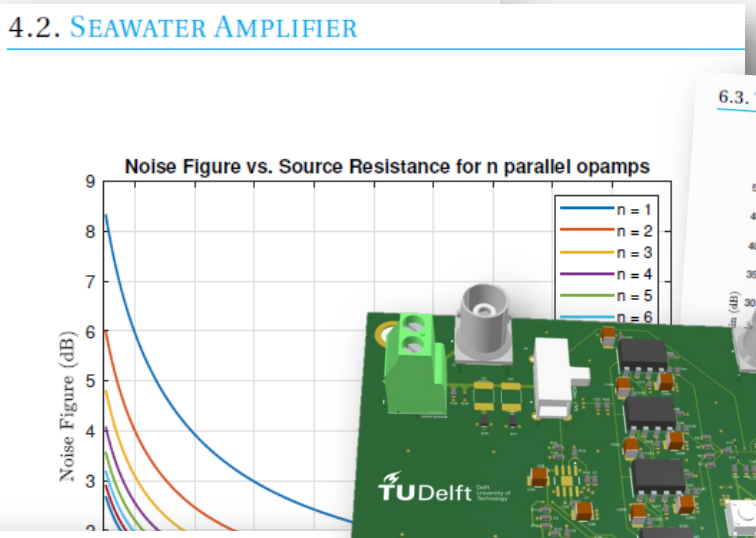
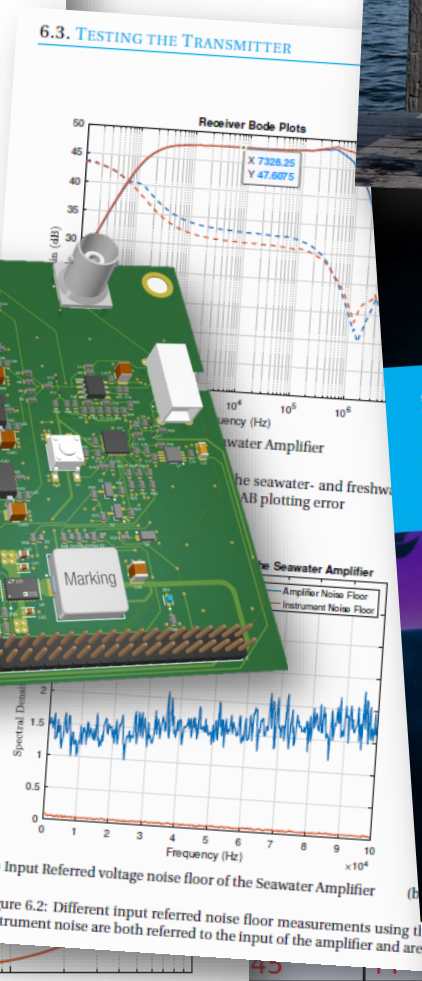
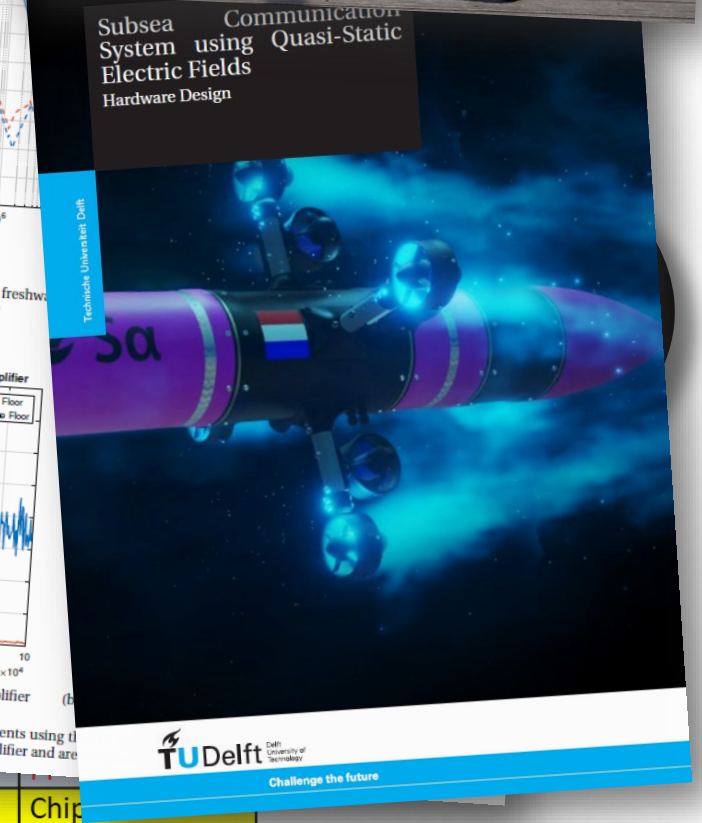
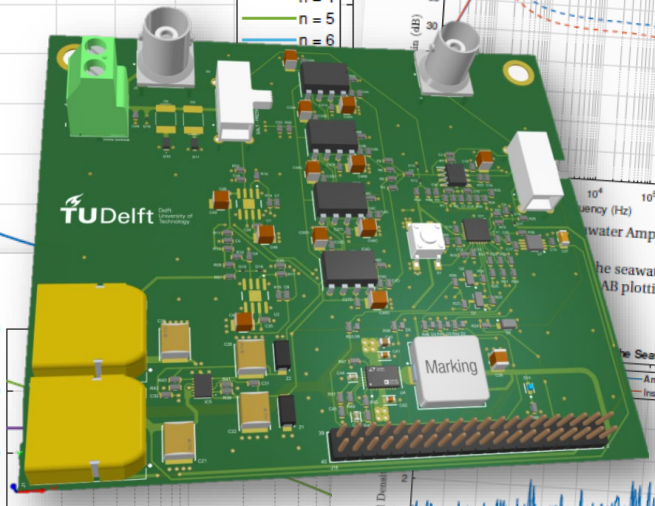
https://www.lobster-robotics.com

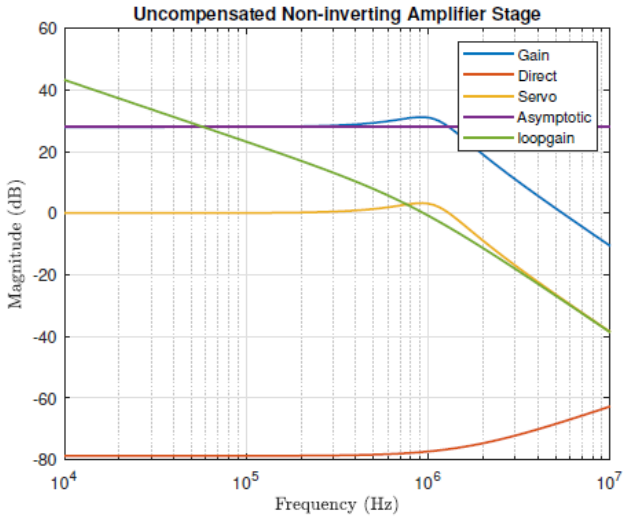


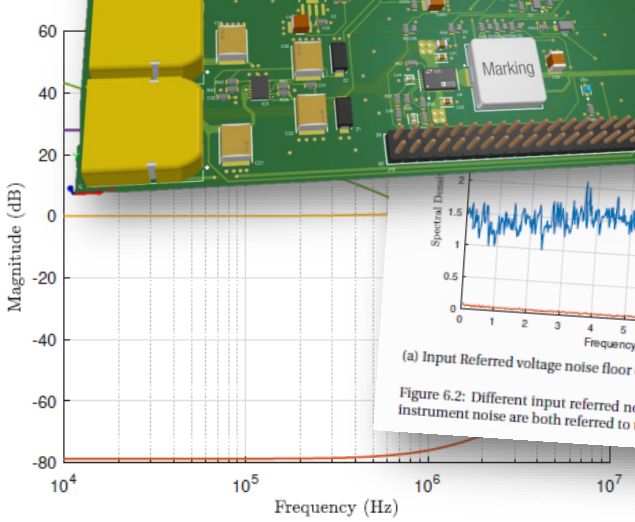






(a) Uncompensated Non-inverting Amplifier




(b) Compensated Non-inverting Amplifier

| | | | |
|---|---|---|---|
| | Physics 10 | Friday, 12 April | 10:45 |
| | | | 45 |
| | | | 45 |
| | | | Chip |
| | | | Tellegen Hall |
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Design, **build, test**

**Bonus**

| | | | | |
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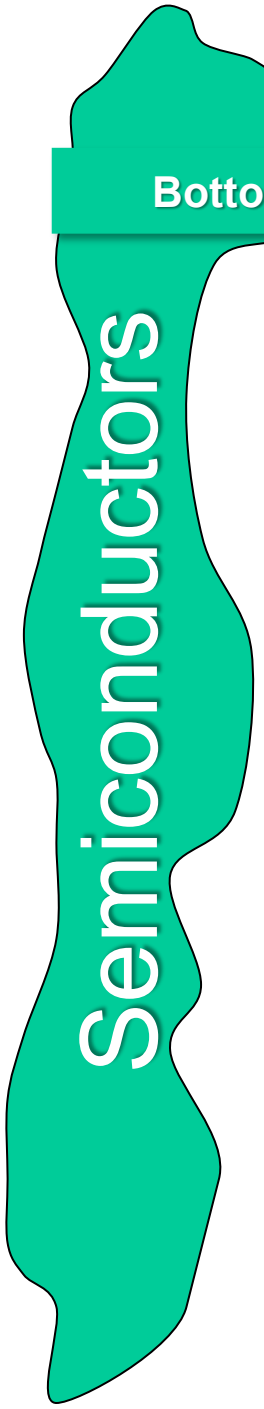

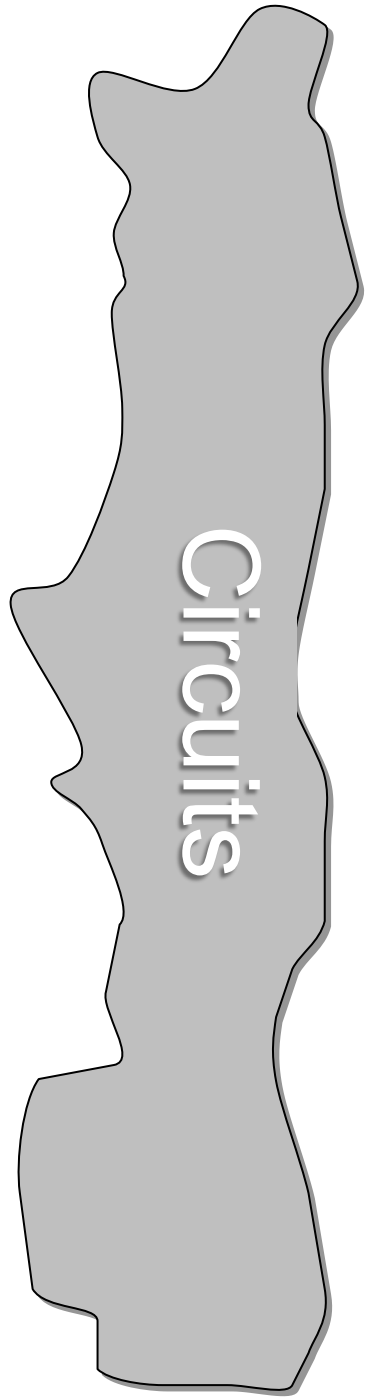
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