

# Principles of Bioelectronics Design – 334011

## Faculty of Biomedical Engineering

### Technion – IIT

<b>Academic Term:</b>	Winter 2019-2020
<b>Credit:</b>	4 points
<b>Pre-requisites:</b>	תורת המעגלים החשמליים - 044105 (צמוד) אותות ומערכות - 044130/044131
<b>Instructor:</b>	<b>Prof. Daniel Ramez</b>
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### Textbooks

- Medical Instrumentation Application and Design, 4th Edition, John G. Webster 2009
- Foundations of Analog and Digital Electronic Circuits, 1st Edition, Agarwal & Lang
- Physics of Semiconductor Devices by S.M. Sze
- Design of Analog CMOS Integrated Circuits, Behzad Razav

## Homework

**Theory assignments (“dry”):** 6 sets of practice questions to be solved individually and submitted using moodle system. The answers will be graded automatically by the system for immediate feedback. Four attempts will be given for each set.

**Computer simulation assignments (“wet”):** Two hands-on basic system analysis and design assignments using industry leading analog design software. Submission using the moodle in pairs. Individual work and submission allowed. Groups of 3 should have special permission.

## Grading Policy

**Homework:** 30% divided to:

- 15% “dry” homework: mean of the best 5 grades out of 6
- 7.5% “wet” – 1
- 7.5% “wet” – 2

**Final examination:** 70%

**Exam day:**

- Term-A: 03.02.2021 (Wednesday)
- Term-B: 17.03.2021 (Wednesday)

## Syllabus

**Devices:**

1. Introduction to semiconductors
2. PN junction
3. MOS capacitor
4. MOS transistor

**Analog Design:**

1. Circuits – small signal analysis
2. Circuits – MOSFET amplifier
3. Differential amplifier
4. Frequency response of amplifiers
5. Negative feedback (optional)