EE 49
Electronics for IoT

Overview
Outline

1. What is “Electronics for IoT”?
2. Administrative
Demo (Time-lapse)
Industrial IoT
Cars

CANbus networks are common for cars built after 1995. They simplify wiring, improve reliability, and let vehicles self-diagnose problems. Safety and convenience features rely on CANbus for the easy exchange of data across the array of computers and sensors scattered around the car.
“Smart” City

- Internet of Things
- Traffic Management
- Smart Health
- Public Safety
- Gas & Water Leak Detection
- Smart Energy
- Water Quality
- Smart Parking
- Electric Vehicle Charging
- Waste Management
- Smart Environment
- Air Pollution
- Education
- Electromagnetic Emissions
- Open Data
- Smart Buildings
- Smart Home
- Smart Street Lights
Electronics
IoT “Brain”

- Laptop, Datacenter
- Microcontroller
Programming

- (Micro)Python
- Same ... laptop, datacenter, microcontroller!

```python
class Account:
    def __init__(self, name):
        assert name != None, 'Name must not be None'
        self.name = name
        self.balance = 0

    def deposit(self, amount):
        self.balance += amount

    def withdraw(self, amount):
        self.balance -= amount

    def __repr__(self):
        return '{} has a USD {} balance'.format(self.name, self.balance)
```
Administrative
Recent Activity in EL ENG 49 - LEC 001

No Recent Messages  You don't have any messages to show in your stream yet. Once you begin participating in your courses you'll see this stream fill up with messages from discussions, grading updates, private messages between you and other users, etc.
## Course Website

### Internet of Things (IoT)

Bernhard E. Boser – bose@berkeley.edu

## Schedule

*Discussions start in Week 2. First assignment is due 1/31/2019.*

<table>
<thead>
<tr>
<th>Week</th>
<th>Start</th>
<th>Topics (tentative)</th>
<th>Reading[1]</th>
<th>Lab (Parts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/21</td>
<td>Electronic signals &amp; circuits</td>
<td>AS 1.1—6; Python</td>
<td>no lab</td>
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<tr>
<td>2</td>
<td>1/28</td>
<td>Circuit analysis</td>
<td>AS 2.1—2, 2.4—6</td>
<td>choose lab partner[2]</td>
</tr>
<tr>
<td>3</td>
<td>2/4</td>
<td>Microcontrollers, memory, ( \text{I}^{2}\text{C} )</td>
<td>AS 3.1—2, 4.1—6</td>
<td>Solar DMM</td>
</tr>
<tr>
<td>4</td>
<td>2/11</td>
<td>Strain gauge, instr amp; MQTT</td>
<td></td>
<td>Solar with MCU</td>
</tr>
<tr>
<td>5</td>
<td>2/18</td>
<td>Opamps, feedback, L, C</td>
<td></td>
<td>MQTT</td>
</tr>
<tr>
<td>6</td>
<td>2/25</td>
<td>Time domain analysis; GPIO</td>
<td></td>
<td>Weather Station</td>
</tr>
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</table>
# Course Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Office Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructor</strong></td>
<td><strong>Bernhard Boser</strong></td>
<td>boser@</td>
</tr>
<tr>
<td><strong>Tuesday, 1:30-2:30pm in 490A Cory Hall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GSIs</strong></td>
<td>Kyle Brady</td>
<td>kwbrady@</td>
</tr>
<tr>
<td></td>
<td>Maruf Ahmed</td>
<td>maruf_ahmed@</td>
</tr>
<tr>
<td></td>
<td>Jeffrey Ni</td>
<td>jeffreyni@</td>
</tr>
<tr>
<td><strong>Wednesday, 4-5pm</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Readers</strong></td>
<td>Hossein Najafi</td>
<td>hossein_najafi@</td>
</tr>
<tr>
<td></td>
<td>Peter Zhu</td>
<td>peterzhu@</td>
</tr>
</tbody>
</table>

+ Piazza
+ Discussions
Homework

• Weekly
• Submit on gradescope (link on bcourses)
Labs

• **Teams of 2**
  – Attend lab next week to find partner

• **Attend lab you are assigned to**
  – Note: Tue lab is full, few students Wed

• **Prelab**
  – Submit on gradescope
  – **Each partner** separate submission
Discussions

• Note: **2 different** discussions per week
  – Monday focus: Homework (2pm or 3pm)
  – Wednesday focus: Lab

• Attend any session you want
**Discussion Sections**

*Note: 2 DIFFERENT offerings each week!*

<table>
<thead>
<tr>
<th>Topic</th>
<th>Homework</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>Monday</td>
<td>Wednesday</td>
</tr>
<tr>
<td>Sections</td>
<td>2-3 or 3-4pm</td>
<td>2-3 or 3-4pm</td>
</tr>
</tbody>
</table>

Attend whichever sections suits you
Grading

- 2 lowest homework scores do not count
- Complete all labs!
Textbook

Kindle Edition

by Charles K Alexander (Author)

★ ★ ★ ★ ★ 170 customer reviews

See all 2 formats and editions

<table>
<thead>
<tr>
<th>Kindle</th>
<th>Paperback</th>
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<tbody>
<tr>
<td>$5.41</td>
<td>from $11.25</td>
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</table>

Read with Our Free App

14 Used from $11.25
7 New from $20.26

Alexander and Sadiku's fifth edition of Fundamentals of Electric Circuits continues in the spirit of its successful previous editions, with the objective of presenting circuit analysis in a manner that is clearer, more interesting, and easier to understand than other, more traditional texts. Students are introduced to the sound, six step problem solving methodology in chapter one and are consistently made to apply and practice these steps in practice problems and homework.

- Covers electronics only
- IoT resources: online (+ lecture!)
DSP

• Register NOW
Questions?