

EEL4744: Microprocessor Applications

Welcome to

EEL-4744C: *Microprocessor Applications*

- I'm **Dr. Schwartz** and I'll be teaching the only section of 4744 (formerly 3744, and returned to 4744) this semester
 - > I'll also be the only one teaching 4744 for the foreseeable future
- If you want to continue learning from where you left off at the end of EEL 3701, you are in the right class!

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EEL4744: Microprocessor Applications


Who am I?

- Let me tell you about myself



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Synchronous Course

- Our lectures and labs will be entirely synchronous.
 - > Attendance is required at the times specified when you registered.
 - > We will **NOT** use Zoom for lectures, so you must attend in-person.
 - > Open Canvas prior to class and leave it open during class for probable attendance quizzes.
- We will use Canvas, Honorlock, and Zoom for Quizzes, Practical exams (Practicals), and our Final.
 - > Practical exams are exams where you design, simulate, build, and demonstrate.

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Menu

(This is the format for the starting slide for every class)

- Philosophy
- Syllabus
- Website



See examples on web:
[syl s25.pdf](#), [schedule.pdf](#)

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Philosophy and Syllabus

- Instructor’s Philosophy
- Course Philosophy
- Course Introduction and Procedures
 - > Slack
 - > Syllabus (see website)
 - Class Organization, Lab times, PIs
- Our website: <http://mil.ufl.edu/4744/>
- Overview
- Class notes (and updates) available on web (for limited time)



[syl_s25.pdf](#)

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PIs / Teaching Assistants

- π = **PI** = Peer Instructor
 - = **UPI** = Undergraduate Peer Instructor
 - > Only graduates students can be TAs (Teaching Assistants)
- Course structure consultants (and video instructors)
 - > Christopher (Chris) Crary
 - > Wesley (Wes) Piard
- We have 9 PIs this semester.
 - > See our syllabus for each of their names and email.
 - > See our website, under [Faculty/Pis](#), for this info as well as pictures of each.



[syl_s25.pdf](#)

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Slack Required!

- If you have not done so already, join our Slack workspace with a link sent previously (by email).
 - > Our slack workspace eel4744.slack.com.
 - > Sign up using a **UF email**; use your **FULL** name.
 - > Announcements about course events and changes in scheduling are done the **#announcements** channel
 - > Ask questions in channel **#help**
 - > Find office hour updates in the **#office-hour-info** channel
 - > Have fun in the **#random** channel
 - Keep it clean, since I’ll read it!



[4744 Slack Rules](#)

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Schedule, Website, Slack

- **Our class website:** <https://mil.ufl.edu/4744/>
 - > See **Schedule** (in classes) for our upcoming events (but Slack has more info).



[schedule.pdf](#)

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Textbook (ISBN: 0195371615 or 9780195371611)


- **Textbook:** F. Cady, *Microcontrollers and Microcomputers Principles of Software and Hardware Engineering*, Second Edition, Oxford University Press, New York, NY, 2009, ISBN13: 9780195371611, ISBN10: 0195371615. This is a **paperback** book.
 - > See <https://tinyurl.com/4744-uP>
 - > You could/should **share** this book **NOT REQUIRED**
 - > I do **NOT** recommend the *international edition* since international editions are often different
 - > If you buy this book, buy **USED** or **RENT** it
 - At **Amazon:**
 - \$7 used; \$114 new
 - At directtextbook.com
 - \$25 used; \$69 rent; \$101 new
 - At **UF bookstore**
 - \$109 used; \$145 buy new
 - From publisher, **\$183 new**, <https://tinyurl.com/4744-uP>



As of
20Dec2024

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Digilent Analog Discovery 2 or 3 (DAD)

- Students (who don't already have one) will borrow a **DAD** (**D**igilent **A**nalog **D**iscovery).
 - > The DAD is required for many UF EE & CpE courses
 - > The DAD-3 is now distributed to all 4744 students during their first lab (Lab 0), assuming they don't have one. All students will return these devices eventually.
 - ECE and CpE students will keep them until completing their last ECE/CpE course, just prior to graduating.
 - Students with other majors will return them near the end of the semester.
 - The DAD-3 uses USB-C and is slightly more capable than the DAD-2, but that will make no difference in our course.

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Digilent Analog Discovery 2 or 3 (DAD)

- **DAD** is now required in many EE & CpE courses
 - >The DAD has the following functions:
 - 2-Channel O'scope (1M Ω , \pm 25V diff, 5MHz bandwidth, 100Msample/sec)
 - 2-Channel Waveform Generator (22 Ω , \pm 5V, 14 bit, and last 2 above specs)
 - 16-Channel Logic Analyzer and Digital Pattern Generator
 - \pm 5VDC Power Supplies (+5V at 50mA, -5V at 50mA)
 - Spectrum Analyzer (3.3V CMOS, 100Msample/sec)
 - Network Analyzer (Bode, Nyquist, Nichols; 1Hz-10MHz)
 - Voltmeter (AC, DC, \pm 25V), Digital I/O
 - Digital Bus Analyzers (SPI, I2C, UART, Parallel)
- We will use it in most of our labs and DURING Practicals 1 and 2

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Manuals and Software

- Microchip/Atmel manuals (from our website and/or Microchip website)
 - >The below **FREE** manuals will be used regularly in the course. A few others will also be used. Get them **ASAP**.
 - https://mil.ufl.edu/4744/docs/XMEGA/doc8331_%20XMEGA_AU_Manual.pdf
 - https://mil.ufl.edu/4744/docs/XMEGA/doc8385_ATxmega128A1U_Manual.pdf
 - https://mil.ufl.edu/4744/docs/XMEGA/doc0856_AVR_Instruction_Set.pdf
- Software
 - >Microchip/Atmel Studio 7.0 (also **FREE**)
 - An integrated development environment (IDE) for developing and debugging Atmel ARM[®] Cortex[™]-M processor-based and Atmel AVR[®] microcontroller applications (including our XMEGA)
 - See the Microchip Studio 7.0 Installation Tutorial at
 - https://mil.ufl.edu/4744/docs/Install_Atmet_Studio_7.0.pdf

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EEL4744: Microprocessor Applications Announcements (Action Items)

- Hardware purchases paid for with lab fees
 - >Note that \$84.76 is incorrect and **WILL BE LOWER!**
 - In fact, last semester’s student fee was **ALSO** too high and will be **partially refunded!**
 - >Parts kit are **borrowed** for this semester (i.e., returned after Lab 8 and Practical 2). Your lab fee pays for part of the costs of these PCBs.
 - The UF-specified boards designed by *Out of the Box Robotics*, <https://www.ootbelec.com/>
 - >You **might** need: USB Port Expander, speaker(s)
 - 3 USB Ports: 1 for μPAD, 1 for DAD, 1 for 3701 (or 4712) PLD
 - No earbuds or headphones allowed in Honorlock (so you might need a cheap speaker)

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EEL4744: Microprocessor Applications Announcements (Action Items)

- Other (possibly necessary) hardware purchases.
 - >Depending on when you took 3701 (and other things), you may also have to purchase some parts that **my** 3701 classes have used for decades.
 - >These items will be needed for Lab 4 and Practical 1.
 - >For those that used a DE10-Lite in 3701 (but don’t own one), you can again borrow one for the month you will need it.
 - >If you took 3701 with Dr. Bobda, you will likely need some items; if you took it with me, probably not.
 - See syllabus or [OOTB 4744 Accessory Kit](#) for the needed parts.
 - **OOTB orders will be deliver to the classroom at a date TBD.**
 - Textbook purchase (**not required**)
 - Can/should be shared; Buy it **used**

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EEL4744: Microprocessor Applications Announcements (Action Items)

- See **Schedule** (on our website, under classes) for our upcoming events (but Slack has more info).
- Get slack! [schedule.pdf](#)
- Submit HW 0 Quiz **before** 11:58**pm** on Fri, 17 Jan.
- If you don't have at least two USB ports of the right type, you may need to buy a USB expander; see the syllabus and the email that I sent before the semester for more info.
- Lab 0 starts on **Tues, 28 Jan.**
 - > Lab 0 is due **Wed, 22 Jan, by 3:59pm**
 - Labs are generally due at least **one day** prior to the start of the lab and a few days before the corresponding lab quiz, but the Lab 0 Quiz will be during Wednesday's Zoom class on Jan 22nd.
 - > You will be **given a lab kit** during your Lab 0 (which you **will** return).
 - **Return this after your last lab demo and Practical 2 are completed.**

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EEL4744: Microprocessor Applications When did you have 3701?

- You will need a **PLD** and a **lab kit**.
- If you don't own a PLD from 3701, you will need to borrow a DE10-Lite (and return it at the end of the semester).
 - > If you had 3701 with me, you should have the lab kit that you need (if your breadboard has two panels).
 - > If you don't have the required lab kit, you can buy one from **OOTB**, the [EEL 4744 Accessory Kit](#).
- If you have your own DAD, you don't need to borrow a new DAD-3.

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EEL4744: Microprocessor Applications Lab 0 and Labs 1-8 Signup


- During our Wed, 22 Jan (before the Lab 0 quiz), you will sign up for both your **Lab 0 time block** and your **Labs 1-8 demo time**.
 - > For Lab 0, you will start be given your lab kit and learn about the lab. This may take as long as 50 minutes (but maybe as little as 30 minutes). [Called **Lab 0 Signup**.]
 - > For Labs 1-8, the PI will select a 10 minute time block for each of your demos for Labs 1-8 and let you know prior to your Lab 1. [Called **Lab 1-8 Signup**.]
- Please view the choices for time blocks in Canvas under People and Groups.
 - > These will open during **Wed, 22 Jan**, sometime during this remote class (4:05-6:00pm).
 - > The Lab 0 Quiz will follow!

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EEL4744: Microprocessor Applications More Announcements

- Class notes (& updates) available on web (for **limited** time)
- Web tour
- Don't blow it up!  Exploding Parts
[Video Link](#)
- Doggone it!  Doggone it!
https://youtu.be/V9d4G_tU5po


[syl_s25.pdf](#)

Attendance quiz!

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