

Department of Electrical and Computer Engineering

EEE 4410 – Embedded Operating Systems

Instructor : Dr. Herman Watson
Office Hours : by appointment
Tuesday & Thursday 2:00 – 4:00 pm
Office : EC - 3951
Sec. Phone : 305.348.2807
Email : watsonh_fiu@yahoo.com (Note underscore)
Classroom/Time
: T, Th – EC2420 9:30 – 19:45 am
Web Page : <http://web.eng.fiu.edu/watsonh/>

Catalog Description:

This is an intermediate course to the use of Embedded Operating System (OS) as a developing environment. Course also includes OS concepts and unique embedded application development. (3 Credits)

Prerequisite : EEL 2880 Applied Software Techniques in Engineering

Textbook:

No textbook required

References:

Christopher Hallinan
Embedded Linux primer: a practical real-world approach, 2nd Edition
ISBN 978-0-13-701783-6
Prentice Hall

<http://www.pearsonhighered.com/educator/product/Embedded-Linux-Primer-A-Practical-RealWorld-Approach/9780137017836.page>

Course Objectives:

Through successful completion of the course, the student will:

- Understand and be able to analyze problem and develop an embedded application.
- Facilitate embedded operating system to develop an embedded application.
- Understand and be able to apply basic operating system concept.

Relationship of course to program outcomes:

- a) an ability to apply knowledge of mathematics, science, and engineering
- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- e) an ability to identify, formulate, and solve engineering problems.
- h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i) a recognition of the need for, and an ability to engage in life-long learning
- j) a knowledge of contemporary issues
- k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Topics Covered:

- Introduction to Embedded Operating System
- Communication and programming embedded platform
- File system
- Permissions
- Process and threads
- Embedded environment and tools
 - Programming
 - Scripting
- Developing embedded applications
 - Processing
 - Sampling
 - Timer
 - Socket

- Networking
 - Synchronous
 - Asynchronous
- Queues
 - Circulation
 - FIFO
- Deadlock

•

Grading Scale:		
A	92-100	"Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook."
A-	90-92	
B+	88-90	
B	82-88	
B-	80-82	
C+	78-80	
C	72-78	
C-	70-72	
D+	68-70	
D	62-68	
D-	60-62	
F	< 60	

Department Regulations Concerning Incomplete Grades

To qualify for an Incomplete, a student:

1. Must contact (e.g., phone, email, etc.) the instructor or secretary before or during missed portion of class
2. Must be passing the course prior to that part of the course that is not completed
3. Must make up the incomplete work through the instructor of the course
4. Must see the Instructor. All missed work must be finished before last two weeks of the following term.

Policies:

- **Academic Misconduct:** For work submitted, it is expected that each student will submit their own original work. Any evidence of duplication, cheating or plagiarism will result at least a failing grade for the course.
- **Unexcused Absences:** Two unexcused absences are permitted during the term. More than two will result in the loss of points from your final grade. (1 point per absence above two, 3 points per absence above 5).
- **Excused Absences:** Only emergency medical situations or extenuating circumstances are excused with proper documentation. After reviewing documentation you are required to email a description of the excuse and absence dates as a written record to watsonh_fiu@yahoo.
- **On Time:** As in the workplace, on time arrival and preparation are required. Two "lates" are equivalent to one absence. (Leaving class early is counted the same as tardy.)

- **Deadlines:** Assignments are due at the beginning of the class period on the date specified. Assignments submitted late (within 1 week) will receive half credit.
- **DO NOT** send assignments by email.
- Instructor reserves right to change course materials or dates as necessary.

Grading Scale: NOTE: There is *no makeup exams* offered

Topic	Percentage
Midterm <i>no makeup</i>	25%
Final <i>no makeup</i>	25%
Project	25%
In class work	25%

I have read and acknowledge the policies and procedures described in this Syllabus

Name _____ Date _____

Class Schedule:

Twice a week, 75 minutes each session: T Th

Week	Date	Weekly Topic
1		Introduction to Embedded Operating System
2		How to communicate to embedded device <ul style="list-style-type: none">• CAT 5• USB single wire• ssh
3		File System <ul style="list-style-type: none">• root• home• opt
4		Permission <ul style="list-style-type: none">• User• Owner• Groups
5		Process and Threads
6		Tools: <ul style="list-style-type: none">• vim• gcc• Bash• Cloud 9
7		Application 1 <ul style="list-style-type: none">• Sampling ADC• Processing samples
8		Application 2 <ul style="list-style-type: none">• Clock sampling• Time
9		Midterm Exam
10		Application 3 <ul style="list-style-type: none">• Socket & Networking Project proposal
11		Application 4 <ul style="list-style-type: none">• Synchronous• Asynchronous
12		Queues <ul style="list-style-type: none">• Circular• FIFO
13		Deadlock
14		Review / Project presentation
15		Project presentation

