

Department of Electrical and Computer Engineering

**EEL 4730 – Programming Embedded Systems
Fall Semester**

Instructor : Dr. Herman Watson
Office Hours : by appointment with Zoom meeting

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Classroom/Time : RVC: Online

Web Page : <http://web.eng.fiu.edu/watsonh/>
Order your parts NOW

Catalog Description:

Embedded Systems implementation using programming of synchronous state machines to capture behavior of time-oriented systems for running on microcontrollers. (3 Credits)

Textbook – license required for this course:

Frank Vahid and Tony Givargis
Programming Embedded Systems
zyBooks.com

Course Objectives:

Through successful completion of the course, the student will:

Understand the stages of the embedded system problem solving process and a relationship to the development of software for implementation.

Use C Language to capture and study time-oriented behavior of systems.

Relationship of course to program outcomes:

- 1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- 2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- 4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- 6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- 7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered:

- Introduction to embedded systems
- Bit-Level manipulation in C
- Time-ordered behavior and state machines
- Time intervals and synchronous SMs
- Input/output
- Concurrency
- Creating a task scheduler
- Communication
- Utilization and scheduling
- Embedded system coding issues

Grading Scale:		
A	92-100	<p>"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."</p>
A-	90-92	
B+	88-90	
B	82-88	
B-	80-82	
C+	78-80	
C	70-78	
D	60-69	
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:

1. **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 in at least a failing grade for the course.
2. **Absences (In Class only):** Resolution of absences and materials missed are student responsibility
 - a) **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).
 - b) **Excused Absences:** Only emergency medical situations or extenuating circumstances are excused with proper documentation.
 1. Request Mitigating Circumstances form
 2. Complete and submit form for review
3. **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.)
4. **Deadlines: Work is due by midnight on the date specified.** Late submissions and corrections within one week will receive up to half credit. **After one week, late work will not be accepted.** Late submissions are graded after the final exam. Participation deadlines are absolute – no late completions or makeups.
5. **Submissions: This class is paperless. Submissions are made using the web form listed on the class web site (online and in class sections).** All submissions must be on the class web site, not Canvas. All submissions must be
 - a) Captures of work must be whole screen images (include time and calendar)
 - b) Everything placed in a single ‘Word’ or ‘pdf’ document stored on your own cloud storage
 - c) Contain your name, date, and time of completion within the document
 - d) Permission: accessible by anyone with link and readable with a browser
 - e) Use a single URL link to view the document
6. **DO NOT** submit work by email.
7. Instructor reserves right to change course materials or dates as necessary.

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

Topic	Percentage
Exam 1 <i>no makeup</i>	16%
Exam 2 <i>no makeup</i>	18%
Exam 3 <i>no makeup</i>	20%
Exam 4 <i>no makeup</i>	20%
Homework	10%
Participation	16%
Zybooks Exercises	8%
MQTT	8%
Attendance	Unexcused absence penalty based on class policy

