

The University of Texas at Tyler
Department of Electrical Engineering

EENG 4325: Real Time Systems (elective)

Syllabus

Catalog Description:

Basic Real-Time Concepts; Computer Hardware; Languages Issues; Real-Time Kernels; Intertask Communication and Synchronization; Real-Time Memory Management; The Software Life Cycle; System Performance Analysis and Optimization; Reliability, Testing, and Fault Tolerance; Hardware/Software Integration; Integrated lab.

Prerequisites: EENG 3307

Credits: 3 (3 hours lecture, 0 hours laboratory per week)

Text(s): Mukul Shirvaikar and Theodore Elbert, **Fundamentals of Real Time Systems**, Cognella Academic Publishing, San Diego, CA, 2017. ISBN 978-1-5165-0189-2, 978-1-5165-0188-5

Additional Material: ARM Board and Development Tools

Course Coordinator: Mukul V. Shirvaikar, Professor

Topics Covered: (paragraph of topics separated by semicolons)

Basic Real-Time Concepts; Computer Hardware; Languages Issues; Real-Time Kernels; Intertask Communication and Synchronization; Real-Time Memory Management; The Software Life Cycle; System Performance Analysis and Optimization; Reliability, Testing, and Fault Tolerance; Hardware/Software Integration; Integrated lab experiments with state-of-the-art real-time hardware and software tools.

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Learning Outcomes¹: By the end of this course students will be able to:

1. Apply real time and embedded systems concepts including requirements, complexity, tasks, and deadlines [1,4,5]
2. Understand real time operating systems, kernels, software design, inter-task communications, and memory management [1,4,5]
3. Utilize modern tools to implement hands-on projects with real time systems [1,4,5]
4. Explain a contemporary issue in real time systems referring to relevant codes and standards as appropriate. [1,3]
5. Describe the impact of real time systems on society. [1,3]

6. Discuss relevant professional ethics related to the professional practice of modern technology e.g. product reliability. [1,3]
7. Incorporate information gained by independent learning from technical reference manuals and other sources to implement projects and enhance reports [5]

¹Numbers in brackets refer to method(s) used to evaluate the course learning outcomes.

Relationship to Student Outcomes (only items in dark print apply)²: This course supports the following Electrical Engineering Student Outcomes, which state that our students will:

1. have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering; [1]
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering; [3]
3. have the ability to analyze electrical circuits, devices, and systems; [2]
4. have the ability to design electrical circuits, devices, and systems to meet application requirements;
5. have the ability to design and conduct experiments, and analyze and interpret experimental results;
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods;
7. have effective written, visual, and oral communication skills;
8. possess an educational background to understand the global context in which engineering is practiced, including:
 - a. knowledge of contemporary issues related to science and engineering; [4]
 - b. the impact of engineering on society; [5]
 - c. the role of ethics in the practice of engineering; [6]
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams;
10. have a recognition of the need for and ability to pursue continued learning throughout their professional careers. [7]

²Numbers in brackets refer to course objective(s) that address the Student Outcome.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

Grade Replacement:

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to file an intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grape point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2006-08 Catalog, p. 35)

Prepared By:	Mukul Shirvaikar, Professor	Date:	8 January 2004 6 January 2005 13 December 2006 17 July 2014 20 July 2016 26 August 2017 23 August 2018
---------------------	-----------------------------	--------------	--

