**ECE 4XX Real Time Digital Signal Processing**

*Cankaya University, ECE Department*

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| Term: | Spring 2014 |
| Weekly Hours: | Starting @Wed 15.40 (Lect.), @Thr 12:40(Lab) & @Fri 15:40 (Lab) |
| Website: | ece487.cankaya.edu.tr |
| Instructor: | Dr. Emre Yengel |
| Room: | LA-21 |
| Email: | e.yengel@cankaya.edu.tr |

**Tentative Course Content:**

1. Introduction to Embedded Systems
2. Analog-to-Digital Conversion
3. Computational accuracy in DSP implementations
4. Architectures for programmable DSP devices
5. Discrete-time systems and signals concept
6. Digital filters: design and implementation
7. Practical frequency-selective digital filters
8. Real-time filtering
9. Real-time audio processing
10. Real-time image and video processing

**Assesment:**  
Homeworks &Lab : %25  
Midterm : %20  
Final : %25   
Project : %25  
Attendence : % 5

**Tentative Lab Content:**

1- Introduction  
2- Sine wave generation  
3- Real-Time FFT Convolution  
4- Digital Filters  
5- Data Scramblers  
6- Pulse Amplitude Modulation  
7- Quadrature Amplitude Modulation  
8- Real-Time Audio-Driven Video Special Effects  
9- Real Time Edge Detection  
10- Real Time Video Compression and Encryption

**Recommended Text Book:**  
  
Real-Time Digital Signal Processing from MATLAB to C with the TMS320C6x DSPs (2nd ed.) Thad B. Welch, Cameron H.G. Wright, & Michael G. Morrow (2011), ISBN: 978-1439883037

**Additional Text Books:**

* Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK (2nd ed.) , Rulph Chassaing, Donald Reay, (2008), ISBN-13: 9780470138663
* Communication System Design Using DSP Algorithms: With Laboratory Experiments for the TMS320C6713TM DSK, Steven A. Tretter (2008), ISBN: 0387748857
* Embedded Image Processing on the TMS320C6000(TM) DSP: Examples in Code Composer Studio(TM) and MATLAB, Shehrzad Qureshi (2005), ISBN: 978-0387252803

**Useful Sources:**

University of Texas EE445S Real-Time Digital Signal Processing Laboratory Course; <http://users.ece.utexas.edu/~bevans/courses/realtime/>

University of Toronto Real-Time Digital Signal Processing Course; <http://www.comm.utoronto.ca/~dkundur/course/real-time-digital-signal-processing/>

Texas Instruments University Education Teaching Materials;  
<http://e2e.ti.com/group/universityprogram/educators/w/wiki/2033.teaching-materials.aspx>