Computer Science 4723

Fall Semester, 2013

Final exam:
Friday, December 13
9:00 – 11:00 AM
EN-1051

Review

- AVR architecture
- AVR assembly language
- I/O ports
  - Program-controlled I/O
  - Port control registers
  - Modeling ports
  - Interrupts
- Sleep modes, power reduction
- Simple circuits
- Counter/timers
  - 8-bit counters
  - 16 bit counters
  - PWM
  - Real-time clock and asynchronous timing
  - clocks as controllers
  - clocks and interrupts — heartbeat
- Synchronous communication
  - SPI communication
  - TWI

- Asynchronous communication
  - USART
  - RS-232
- Testing serial data communication – loopback
- The Standard I/O library
- Motors and motor control
  - DC motors and their control, motor drivers
  - Servos
  - Stepper motors
- Analog comparators
- Analog to digital conversion
  - How they work
  - Types of errors
- Low power considerations
  - clocking
  - power reduction registers
  - sleep modes

- "Disaster recovery"
  - Resetting the processor
  - Watchdog timer
  - Brownout detection
- EEPROM memory
- Operational amplifiers
  - OP AMP properties
  - Simple amplifiers, feedback – unity gain amplifier
  - Inverting and non-inverting amplifiers
  - operational circuits — summers, inverters, integrators, etc.
  - single supply op amps
- Conditioning input and output signals
- sensors and transducers