Poul Vaeggemose : IT-CAO1X-A20, 26.08.2020.

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| Lections | Date | Teori | Exercises/Assignments |
| L1 | 31/08 | Boolean Logic and Boolean arithmetic and breadboard   * Boolean values * Boolean operations * Truth table and Boolean functions * Boolean algebra * Binary numbers * Breadboard * Exercise | Falstadt logic circuit simulator <http://www.falstad.com/circuit/>  Falstadt simulation  <http://tinyurl.com/y6txyf9t>  Resistor color code  <https://www.electronics-tutorials.ws/resistor/res_2.html>  Breadboard with SN74HCT00N gate <http://www.ti.com/lit/ds/symlink/sn74hct00.pdf>  Exercise: Boolean Logics (NAND gates, OR gate and XOR gate) |
| L2 | 7/9 | Boolean Arithmetic and ALU   * Convert truth-table to function and visa versa * Reducing boolean functions * Half adder * Full adder * Multibit adder * Multiplexer and demultiplexer * The Arithmetic Logic Unit (ALU) * Exercise | Falstadt simulation  <http://tinyurl.com/y2o7tdex>  Falstadt simulation  <http://tinyurl.com/y3brwtf4>  Watch this video  <https://www.youtube.com/watch?v=0as464WmfCo>    Exercise: Boolean Aritmetic |
| L3 | 14/9 | Sequential logic   * Time independent Logic * Clock * Flipflop * 1-bit register * Memory units * Big Endian and Little Endian * Counters * Exercise | Falstadt logic circuit simulator <http://tinyurl.com/yxkd8mj7>  View CPU animation  <http://courses.cs.vt.edu/~csonline/MachineArchitecture/Lessons/CPU/>  Exercise: Sequential logic |
| L4 | 21/09 | Boolean Arithmetic and ALU   * CPU * ALU * Registers * Program * Counter * Control unit * CPU cycle * Computer Architecture * Instruction set * Hand in | How CPU works (example Scott CPU)  <https://www.youtube.com/watch?v=cNN_tTXABUA>  Mandatory assignment 1:  Boolean Arithmetic and Sequential Logics knowledge  Hand-in date: 30.09.2019 at 23:45 o’clock |
| L5 | 28/09 | Machine language (assembly language)   * Computer Architecture * Instruction set is limited * Computers are flexible * Assembly language * Exercise | ATmega2560 instruction set  Assembly language to binary code  Assembly code  Watch this video  <https://www.youtube.com/watch?v=zltgXvg6r3k> |
| L6 | 05/10 | AVR introduction   * The general purpose registers of the CPU * Data memory * Data memory instructions * IN and OUT * Status register (flags) * Data formats * Assembly language | Exercises from book  Install and run Atmel Studio  Connect Arduino 2560 board to PC and to LED  Programming Arduino with Atmel Studio  Turn on LED’s connected to 2560 board port A0  Exercise: Machine Language |
|  | Week 42 vacation |  |  |
| L7 | 19/10 | Branch, Call and time delay Loop   * Branch * Looping * Call * Call vs Jump * Execution time * Time delay | Make LED’s blink with 1 Hz    Make the external LED blink with 0.1 Hz  Exercise: Branch, Call and Time Delay |
| L8 | 26/10 | Pin, Port, Bit manipulation, Calculations   * PIN and PORT * I/O Port programming * Bit manipulation * Calculations * 1’s and 2’s complement * Multiplications * Hand-in | Read switch value (take care of the switch prel)  **Mandatory assignment 2:   AVR architecture knowledge,  LED 10 Hz blink frequency,   Add 2 values and send result to port B**  **Hand-in date: 10.11.2019 at 23:45 o’clock** |
| L9 | 2/11 | VIA calling convention   * Call setup * Call Site * Saving working registers * Retrieving input values * Implementing function body * Saving output value * Restoring working register * Return from function * Retrieving output value | Exercise: VIA calling convention |
| L10 | 9/11 | Floating Point motivation  The word is Not just Inters  Floating-Point Numbers  Floating-Point Representation  IEEE 754 Floating-Point standard  Normalized Floating-Point  Biased Exponent Representation  Single Precision Float  Double Precision Float  Largest Normalized Float  Smallest Normalized Float  Zero, Infinity and Not a Number  Rounding  Examples | Exercise 10 |
| L11 | 16/11 | Practice makes perfect | Exam exercise |
| L12 | 23/11 | Review session | Syllabus repetition |

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