

Electronic circuits (B)

Close Project, 3rd year Com., Apr. 2015

Aims:

- Make use of learned concepts to understand the function and operation of some electronic circuits used in many applications and devices.
- Implement a digital unit/ piece of algorithm using VHDL language via software package and hardware kit Spartan-3E kit and build a test bench for it as well.

Delivery time:

13th ~ 16th of May 2015.

Select one of the following projects and work on it according to its specs:

#	Description	Teams members
<u>Project #1:</u>	<p>Design and implement a function generator circuit using op-amp and supply it using one of the discrete power supply circuits.</p> <p><u>Hints:</u></p> <ul style="list-style-type: none">○ PCB board is required.○ Usage of IC regulators is not allowed.○ You will test the circuit in the lab and the equipment that you are allowed to use is <u>only</u> the oscilloscope and the 220v ac outlet.	3:4
<u>Project #2:</u>	<p>Implement a dual ALU unit to be used in parallel computing programs and write a test bench model for it.</p> <p><u>Hints:</u></p> <ul style="list-style-type: none">○ Design issues that not mentioned in the project specs should be assumed and mentioned upon delivery.○ Implementation and testing on the Spartan-3E kit is required.	1:2
<u>Project #3:</u>	<p>Implement the following functions and write a test bench for them.</p> $f_1 = \frac{\min(a1,a2)}{\max(a1,a2)} \text{ \& } f_2 = \log_2 \det (I_{2 \times 2} + X_{2 \times 2} X_{2 \times 2}^T)$ <p><u>Hints:</u></p> <ul style="list-style-type: none">○ Variables are assumed to be of any type.○ Implementation and testing on the Spartan-3E kit is <u>NOT</u> required.	2:3