**Purpose:** In this experiment, you will design and implement a VGA controller on an FPGA board. Display your results on a screen. Comment on your RTL schematic.

## NOTES:

1. You must prepare and upload your preliminary report to Moodle before its deadline. Late submissions are not allowed. If you have not submitted your preliminary work on time, you are welcome to attend the lab but you will get zero from that lab.
2. Before you leave the lab you must upload the Lab reports to Moodle. You are not allowed to write your reports after the lab. *Late submissions are not allowed*.
3. You must show your lab results (Demo on a screen) to your assistant and get his/her approval in the lab hours.
4. The photographs of VHDL codes will not be accepted and you should include them to your lab reports by just copy pasting.
5. You can write your lab report in Open Office or Microsoft Office. After completing the writing process, **"Save the report in pdf format"**, upload it to Moodle before leaving the laboratory. This report will also be used as a proof of your attendance. Your laboratory report is an individual effort and should be unique. Original work is required by all the students (NO PHOTOCOPIES, DUPLICATE PRINTOUTS OR CHEATING).

**The Lab Preliminary Report** should contain the following (necessarily in this order):

- **Heading**

  The experiment number, lab title, your name, and date should be at the top right hand side of each page.

- **Abstract / Objective**

  The purpose of the abstract is to provide a brief overview of the report. In your own words, state the purpose of the laboratory exercise, the basic concepts covered, a very brief (two or three sentences) overview of the procedure followed.

- **Design Specification Plan**

  For a set of requirements, there are many ways to design a system that meets the requirement. The Design Specification Plan describes the methodology chosen and the reason for the selection.

- **Proposed Design Methodology**

  You should describe how you communicate with the monitor via VGA port, also explain how you manage to establish this connection with VGA using VHDL.

- **VHDL Model**

  In this preliminary work, you do not have to write VHDL codes but explain VHDL module(s), how you will implement them and your inputs/outputs.

**The Lab Report** should contain the following (necessarily in this order):

- **Heading**

  The experiment number, the lab title, date of the experiment, your section and your name should be at the top right hand side of each page.

- **The Design Methodology**

  The design methodology presents much of the theory behind the lab exercise, which was confirmed with software simulations, hardware implementations, algebraic equations, etc. You should write how to design it. Please do not copy text from your "Proposed Design Methodology" part of your Preliminary Work. You must write the changes according to the "Proposed Design Methodology" which you have mentioned in your Preliminary Work.

- **Results**

  In this section, you should clearly explain the work you have done in the lab in detail. The laboratory report is the record of all work pertaining to your experiment. The results section will have subsections if there is more than one result to present. You will include the results of your design procedure. The results section will typically attach your VHDL code, Pin Assignment (.ucf file/.xdc file), RTL Schematic diagram etc., if necessary. Any of included figures must be labeled. All results must be explained and discussed.

- **Conclusion**

  In this section you should write about the concepts that you learned in the laboratory and how they relate to other aspects of the course or digital design in general. If you experienced problems or obtained data that was incorrect, here is where you might elaborate on the causes and ideas for solutions.

- **Appendices**

  Other materials that are referred in your report.