CONCORDIA UNIVERSITY
Department of Electrical and Computer Engineering
COEN 317 Section F
Fall 2022

Laboratory Guidelines

Lab Coordinator:

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Lab Instructors: To be announced.

Facilities:

The COEN 317 laboratory is located in room H-913. The lab will also be accessible outside of the scheduled lab hours to allow additional practice and completion of the experiments. The lab is equipped with Linux workstations installed with Xilinx PlanAhead, XPS (Xilinx Platform Studio), SDK (Software Development Kit) , and ISE software tools. The lab is equipped with 16 Xilinx Zynq ZC702 development boards. The software used in the lab is also available from any ENCS dual-boot PC lab. The Zynq boards are only available in H913.

Grading Scheme:

15% lab reports
5% lab quiz

Lab Exemptions:

THERE ARE NO LAB EXEMPTIONS. "If you are repeating the course for any reason, you are required to redo all the lab experiments, to obtain new data, to write new lab reports (including the prelab),and to take and pass the lab test. You are NOT permitted to resubmit lab results or lab reports from a previous semester."

Lab Content:

There will be a total of 5 lab exercises for this course held during scheduled lab sessions and a lab quiz.

Lab quiz:

The lab quiz will be held during the last week of November (Nov. 28 - Dec. 2, 2022) - exact dates and times will be announced at a later time) The quizzes will be designed to test your familiarity with software tools used in the lab as well as the general concepts the labs deal with. Further details and instructions regarding the lab quiz will be given during the course of the semester.

Lab Manual:

A set of 5 lab handouts will be made available, either in class or online via the Moodle course web site. All the lab material is also available on the ENCS Linux systems in the directory:

/home/t/ted/PUBLIC/COEN317

```
ted@deadflowers COEN317 1:48pm >ls -al
total 32
drwxr-xr-x  8 ted ted 4096 Sep  8  2016 .
drwxr-xr-x 14 ted ted 4096 Jan 10  2017 ..
drwx------  8 ted ted 4096 Aug 25 13:48 Fall_2015
drwxr-xr-x  2 ted ted 4096 Aug 25 13:48 Lab1
drwxr-xr-x  2 ted ted 4096 Aug 25 13:48 Lab2
drwxr-xr-x  3 ted ted 4096 Aug 25 13:48 Lab3
drwxr-xr-x  2 ted ted 4096 Aug 25 13:48 Lab4
drwxr-xr-x  2 ted ted 4096 Aug 25 13:48 Lab5
```

Some of the labs requires datasheets for the various AXI components used in the lab. These datadsheets are aslo included in the directory for the particular lab.

The Linux command to view a PDF is:

acroread filename.pdf

You are very strongly encouraged to go through the lab handouts in detail BEFORE the labs start.

The Electronic Design Automation (EDA) software used in this lab runs under the Linux operating system. The lab is equipped with HP Linux workstations. If you are not familiar with basic Linux commands, you should learn basic Linux skills. There is a "ECE UNIX/Linux Guide" available online on the ENCS Linux systems in the directory:

/home/t/ted/PUBLIC/UNIX_TUTORIAL

Lab Reports and hardware demonstrations:

Lab reports are due at the beginning of the lab session following each experiment. Late lab reports will receive a **10% penalty** for each day they are delivered late, the first day being the day of submission past the deadline. Your lab instructor will provide further information regarding submission of lab reports.

The labs will be performed INDIVIDUALLY. A report shall be written and submitted for each lab. For each lab you must demonstrate the functionality of your design to the lab demonstrator and you are expected to be able to answer any questions asked of you by the lab TA during the demonstration. The demonstration for an experiment will take place at the same time that you submit your lab report.

Students should submit a signed copy of the Expectations of Originality Form at the beginning of the semester to the instructor. Then the student should write on the front page of each lab report "I certify that this submission is my original work and meets the Faculty's Expectations of Originality", with his or her signature, I.D. #, and the date. Refer to:

http://www.concordia.ca/ginacody/students/academic-services/expectation-of-originality.html

Policy on plagiarism:

The labs involve writing C++ code to run on the Zynq boards in addition to using the various software tools in order to create the hardware platform for each lab. The program source code is to be unique and individual from student to student. In no case are you allowed to submit work or portions of work of another student.

Plan your time ahead so that you can submit the work in time. If you need further assistance with the lab content, you can ask your lab demonstrator for help.

Any incident of plagiarism will be dealt with according to the Academic Calendar no exceptions. Refer to the calendar section 17.10. for further details. A quick summary of what constitutes plagiarism and what are the consequences can be found at:

http://www.concordia.ca/conduct/academic-integrity.html

Lab related announcements:

Announcements regarding the lab will be made by your lab instructor and/or course instructor during class.

ECE accounts:

You will be using your ECE UNIX account for the labs and the lab exam. If you have not yet obtained your ECE account pass by the Service-Desk (H-964) and ask for it. Also, if you need to contact faculty/staff of the university by e-mail, use **ONLY** your ECE account and not free e-

mail services such as Hotmail or Yahoo. If you must use a non-ECE email account, include your full name and student ID number in the body of the email. **All lab related email must include your full name, your Concordia student ID number, the course number and the lab section. Any received email not including the required information shall not be replied to.**

Details about lab scheduling:

The lab for COEN 317 is a **bi-weekly** lab. **Labs commence the week of September 19, 2022,** which is an "ODD" week in the alternating weekly schedule. "Even" week labs begin the following week on **September 26, 2022**. To avoid any confusion, the following gives the start dates for each lab section:

```
Lab FI-X Odd  --W----   First lab on Wednesday, Sept. 21, 2022
Lab FJ-X Even --W----   First lab on Wednesday, Sept. 28, 2022
Lab FK-X Odd  ---J---   First lab on Thursday, Sept. 22, 2022
Lab FL-X Even ---J---   First lab on Thursday, Sept. 29, 2022
Lab FM-X Odd  M------   First lab on Monday, Sept. 19, 2022
Lab FN-X Even M------   First lab on Monday, Sept. 26, 2022
```

Note: These dates supersede those listed in the SIS portal.

Table 1: Weekly Schedule for Odd Weeks (labs beginning Sept.19, 2022)

Lab #	Monday	Tuesday	Wednesday	Thursday	Friday
1	Sept. 19	Sept. 20	Sept. 21	Sept. 22	Sept. 23
2	Oct. 12 (Oct. 3 elec-tion)	Oct. 4	Oct. 5	Oct. 6	Oct. 7
3	Oct. 17	Oct. 18	Oct. 19	Oct. 20	Oct. 21
4	Oct. 31	Nov. 1	Nov. 2	Nov. 3	Nov. 4
5	Nov. 14	Nov. 15	Nov. 16	Nov. 17	Nov. 18

Table 2: Weekly Schedule for Even Weeks (labs beginning Sept. 26, 2022)

Lab #	Monday	Tuesday	Wednesday	Thursday	Friday
1	Sept. 26	Sept. 27	Sept. 28	Sept. 29	Sept. 30
2	Oct. 24 (Oct. 10 holiday)	Oct. 25 (Oct. 11 Reading Day)	Oct. 26 (Oct. 12 election make up)	Oct. 13	Oct. 14

Table 2: Weekly Schedule for Even Weeks (labs beginning Sept. 26, 2022)

Lab #	Monday	Tuesday	Wednesday	Thursday	Friday
3	Nov. 7	Nov. 8	Nov. 9	Oct. 27	Oct. 28
4	Nov. 21	Nov. 22	Nov. 23	Nov. 10	Nov. 11
5	Dec. 8 (or Dec. 5 will be announced)	Dec. 6	Dec. 7	Nov. 24	Nov. 25

Lab reports:

The lab report should contain the following sections:

1. Cover page
Include the experiment number/title, course code, course name, lab section, name and ID number, the name of the lab instructor and the due date and the date the lab was performed.

2. Objectives
State **briefly** in your own words the objectives of the experiment. An example of a concisely written objective is:

"The objective of this lab is to become familiar with the procedure involved in the creation, compilation, and downloading of a "Hello World" C++ program for the Zynq ZC702 board using the Xilinx PlanAhead and SDK software tools."

3. Theory
Present **briefly** in your own words the relevant theory for the experiment. Consider the following as an example:

"The Xilinx AXI GPIO (General Purpose Input/Output) IP component is used to provide a mechanism to communicate between the processor (PS) and the programmable logic (PL) contained within the ZC702 device. It is connected using an AXI Interconnect. Software function calls may be used to both send data to the port or the read data from the port. The GPIOs are instantiated using the Xilinx XPS software during the development of the system platform. The GPIO's are user programmable both in terms of whether the port is an input or an output and can be configured in terms of data width of up to 32 bits wide. In this lab, a hardware system is developed consisting of the processor and two GPIOS, one is used as an input to read the state of a user push button switch and the other is an output port used to drive the user LEDs on the Zynq board."

4. Questions
Answer the questions posed in the handouts.

5. Conclusions

State what was achieved in the lab and contrast with the experiment objectives. Conclude on the salient portions of the lab.

6. Appendix

Include your program source code which is to be signed by the lab TA during the demonstration of the lab.