

EE 5327 – VLSI DESIGN LAB

Guidelines for Project Report II

1. Your project report header should consist of the following:

EE5327 VLSI Design Project, Report II

Submitted by: <your name>, Email ID: <your email>

2. In Report II, please complete the full synthesis, APR and sign-off of your design. The clock frequency should be around 800MHz.
3. **Design Description (3 pages):** Describe the architecture of your design, such as the application, main design modules, data flow, pipeline, etc. Please include necessary registers, the clock tree, and power distribution to complete the sequential design.

Please present a block diagram of your design and describe the function of each major block. Describe the interface among your blocks, and between your design and the external system.

Please include a table giving the names of the I/O ports, their bit-widths and their directions.

4. **Synthesis, APR and Sign-off Analysis (4 pages):** Present the details of any design revisions, tradeoffs and optimizations from Report I. Please provide the synthesis results in the form of tables of your final implementation, including scan insertion and other considerations of fault coverage. Present the results for floorplanning, placement, routing and sign-off analysis. For each type of result, please include a brief sample of the report by EDA tools, to demonstrate your work. Please identify the critical path that limits your clock speed, with a screen shot and brief explanations.
5. **Verification and Simulation Results (3 pages):** Please explain your verification strategy, such as exhaustive and/or random verification, simulation of special cases, comparison with Python simulations, etc. It is important to include a sufficient amount of verification results, beyond a few simple examples. Please specify test benches, such as the precision, etc., and include key waveforms to verify the functionality, with descriptive annotations. In the results part, please include such a table:

| Metrics | Unit | Reference Design | Your Design |
|-----------------|-----------------|------------------|-------------|
| Gate count | | | |
| Clock frequency | MHz | | 800 |
| Area | μm^2 | | |

6. **Conclusions and References (1 page):** Summarize your report. Explain the challenges that you faces and how you overcome them. Please also include the reference toward the end of your report.

Presentation and Submission:

1. Please use Times New Roman (font size 12) for your write-up and Courier New (font size 12) fonts for your code listings.
2. Please only include codes when necessary. Please ensure that your code is appropriately commented and indented to make the report easier to read.
3. Please include the screenshots of report_design and report_area.
4. For waveforms and schematics, please use either a black or a white background when you are obtaining the screenshots. Add appropriate captions to all waveforms and schematics.
5. Please upload only a PDF version of your report, using the following file naming convention: EE5327_Project_Report II_<Name>.pdf