EECE 579 Project Requirements
Spring 2009

Project Goal:

The goal of this project is to create an Intellectual Property (IP) block or CAD tool for use in a System-on-Chip (SoC) development.   The IP block or CAD tool must be delivered in a state such that a SoC designer would be able to use it with confidence, therefore it must *verified* and *documented* carefully.

Key Deliverables:

1) a analog or digital circuit design, or a CAD tool

   The circuit designs may be described/implemented with schematics, Verilog/VHDL or even other high-level languages (with special approval). The format must be chosen such that it is appropriate for the circuit being created, and bearing in mind that there must be a way to simulate the design in order to verify its correct operation.

   The CAD tools may be described/implemented with C, C++, tcl, Python, or some other mainstream programming language. Again, remembering that there must be away to verify the correct operation of the tool.

2) a detailed design document for the circuit or CAD tool

   The design document must answer the following:

   a. What is the purpose of the circuit or CAD tool?
   b. How does this circuit or tool fit into the SoC development process?
   c. What is the interface to the circuit, or API for the CAD tool?
   d. What does a SoC designer have to do to use the circuit or tool effectively?
   e. What are the restrictions on the uses of the circuits or tool?
   f. What procedures where used verify the correct operations?

Document Format:

The documents for the project should follow this format:

1)   Abstract
        Provide a short summary of the project. Quickly: What does it do? Why is it useful?

2)   Introduction
        Introduce the basic functionality of the circuit or tool. Summarize the features, limitations, interfaces. Explain how the circuit or tool fits into the overall SoC development process.

3)   Block Diagram / Flow Chart
        *Provide a **high-level** block diagram (or flow chart for CAD tools). Be sure to label all inputs and outputs. Use this as a reference in later sections.*

4)   Implementation Description

*Describe the implementation of the circuit or CAD tool. **Do not** re-write the schematic/VHDL/ C in english, rather explain the major concepts and why they work. You can add more diagrams here. This is your chance to point out clever things in your circuit or tool. This section should allow me start looking at your circuit, but does **not** need to explain every transistor in the design or for-loop in the C code.*

5)   Verification Description

Describe the simulations that were done to verify the circuit or CAD tool and explain why they are sufficient prove the circuit or tool will work in the overall SoC. You must convince me that your circuit or tool will work. This is important.

6)   Integration / Operations

Describe any special restrictions that must be followed to integrate the circuit into the SoC, or the CAD tool flow. Also, describe any special restrictions on the operation of the circuit or tool.

Marking:

Quality of the Design / Algorithm:	/20
Documentation -	
Overall Clarity:	/10
Verification Description:	/20
Design Description:	/10
SoC Integration Description:	/10

Total: /70

Final Remarks:

The key here is to find a circuit or tool that is sufficiently complex that you can fulfill the requirements of the project without being so complex that you never finish. Although it shouldn't be trivial, the design or tool **does not** have to be novel or better than anything that has every been done before.   What is important is that you show it works correctly and that you show you understand how it would fit into the bigger picture of the SoC design process.