

## **EEP 598: Digital Systems Design with FPGAs**

### **Course Description:**

EEP 598 focuses on leveraging Field Programmable Gate Arrays (FPGAs) for designing digital systems. This course covers FPGA architectures, design processes, and their applications in accelerating processing speeds in areas such as genomic research, financial analysis, and video processing. Students will acquire skills in combinational and sequential logic design, algorithmic state machines, and FPGA design and implementation.

### **Prerequisites:**

- Familiarity with Java or C++, including data structures and algorithms.
- Basic knowledge of electrical circuits.

### **Instructor:**

Sep Makhsous

Email: sosper30@uw.edu

### **Communication:**

Main platform: Slack (Mandatory for all students)

### **Class Schedule:**

- Lectures: Monday & Wednesday, 4:00 PM - 5:50 PM, ECE 269
- Labs: 3 Labs and one final project

### **Course Format:**

- In-person classes with a zoom option for remote attendance (limited engagement)
- Lectures followed by In-Class Team Exercises (ICTEs)
- Recorded lectures and prefilled slides available post-class

### **Grading Policy:**

- Homework: 20%
- ICTEs: 10%
- Labs: 50%
- Midterm: 20%
- Bonus: 5%
- Total: 105%

### **Course Materials:**

Materials provided via Canvas, including lecture notes, homework, and lab assignments. No textbook purchase required; reference materials listed on Canvas.

**Key Topics:**

- FPGA Architecture and Design Process
- Combinational and Sequential Logic Design
- Algorithmic State Machines and Finite State Machines
- Clock Domain Crossing and Meta-stability
- EDA Tools and System Verilog

**Assessments:**

- Homework assignments submitted as PDFs on Canvas
- In-class team exercises during the second hour of lectures
- Labs conducted individually, with compulsory pre-lab tutorials
- Take-home midterm exam

**Important Dates and Guidelines:**

- Homework due every Friday at midnight, with an automatic extension to Saturday midnight
- Labs must be initiated early; late submissions will result in a grade of zero

**Additional Information:**

- Class recordings accessible via the Zoom tab on Canvas
- Office hours and additional support sessions held remotely via Zoom