

HDL and FPGA

Syllabus Number

3E329

Special Subjects

Elective 1 credit

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1. Course Description

The main aims of this course are to know the importance of hardware description language (HDL) and field programmable gate array (FPGA) in the current industry fields including ICT and also manufacturing industry. We will focus on the applied examples rather than theoretical foundations of mathematics by using a development environment of FPGA practically.

This course relates to DP4E.

2. Course Objectives

This course introduces the fundamentals of hardware description language (HDL) and field programmable gate array (FPGA).

By the end of the course, students should be able to do the followings:

1. Recognize and recall major terms and concepts of HDL (especially Verilog HDL).
2. Use a development environment of FPGA.
3. Design simple logic circuit by using FPGA.
4. Recognize terms and concepts of IP core.

3. Grading Policy

Little tests during classes (30%)

Report (70%)

The results will be informed and reviewed mainly via LMS.

4. Textbook and Reference

Textbook

Textbook is not used. Handouts are provided.

Reference

Kobayashi Japanese book (ISBN: 978-4798063263) SHUWA SYSTEM CO., LTD
Susutawari Japanese book (ISBN: 978-4798045894) SHUWA SYSTEM CO., LTD
Kobayashi Japanese book (ISBN: 978-4774156514) SHUWA SYSTEM CO., LTD
Simon Monk English book (ISBN: 978-1259643767) McGraw-Hill Education TAB

5. Requirements(Assignments)

For preparation, 30 min are required for each class in standard. You should read web site instructed in classes.

For review, 60 min are required for each class in standard. Practice questions for review will be distributed in class.

6. Note

In FPGA programming, students should make their own backups using USB flash drive or portable HDD.

7. Schedule

Introduction

How to use FPGA; practical lesson of development

Basic of HDL about combinational logic circuit

FPGA implementation of combinational logic circuit

Basic of HDL about sequential logic circuit

FPGA implementation of sequential logic circuit

IP core; intellectual property core

Summary and preparation of report