

**COURSEDETAIL OUTLINE
LOGICCIRCUIT DESIGN**

Training Major: Electronics– Telecommunications EngineeringTechnology
Training System: Regular University

1. Course name: LOGIC CIRCUIT DESIGN

2. Number of Credits: 3

3. Level: For the third year students (4–year system)

4. Time allocation:

–**At the class: 15 periods (3 periods / week)**

+ Theoretical: 15 periods.

– **Practical: 30 periods (3 periods/ week)**

– **Self–learning: 120 hours**

5. Prerequisites: Students must complete othercourses such as:Electronic Circuit Techniques, Electronics Devices, Digital Logic Circuit Engineering, Micro–processor Techniques.

6. The Course’s Objectives

6.1. About the Knowledges

+ Students can firmly understandthe theory of analog circuit techniques, and be able to design the voltage regulator source circuit, the power amplifier circuit...

+ Students can firmly understand the theory of digital circuit techniques, and be able to design combination and sequential circuits...

+ Students can firmly understand the theory of micro–processor techniques, and be able to design a microcontroller system and program the hardwarewith C / C ++languages...

6.2. About the Skills

+ Students become familiar and practice the skills to implement a course project.

+ Students become familiar and practice the skills to work independently and teamwork.

+ Students can apply their knowledge in subjects, such as analog circuit techniques, digital circuit techniques and others knowledge of the major into the logic circuit design course project.

+ Through the course project implementation, students will learn and practice the basic steps to design a complete digital circuit.

+ Students know how to write and represent reports in Vietnamese (and English).

6.3. About the Attitudes

+ Forming the responsible of community contributions.

+ Know the digital circuit design flow

+ Know how to comment and evaluate the phenomenons and incidents may occur during the circuit assembling or repairing process.

+ Forming the critical thinking, self-learning, and science and technology self-researching capabilities.

7. Course Content Description

The course includes three chapters, as following:

– Chapter 1: THE FUNDAMENTALS

In this chapter, the whole theoretical basis of the digital circuit techniques will be more detailed recalled. Besides, this chapter also introduces the parameters of the specific ICs for the functions of logic gates, the combination and sequential circuits...

– Chapter 2: LOGIC CIRCUIT DESIGN

Chapter 2 will introduce the logic circuit design's purpose. In addition, this chapter also introduces the specific steps to design a complete digital logic circuit.

– Chapter 3: EXAMPLE DESIGNS

Chapter 3 will focus on examples of logic circuit design. Students will learn how to design digital circuits using digital ICs and programmable circuits.

8. The Duties of Students

– Students must attend at least 80% of classroom lessons.

– Students must implement the course design project under the guidance of the guidance teacher.

– Students must report their course project implementation progress regularly for the guidance teacher.

– Students must complete course project report at the end of study and recite it to the guidance teacher.

– Students must represent course project report using Powerpoint for evaluation and grading.

– Students must implement a hardware product, combining hardware and software, or at least, run the digital circuit simulation program with equivalent functionality.

9. Learning materials

– Key Textbooks:

[1] Digital Logic Circuit Analysis and Design, Victor P. Nelson, H. Troy Nagle, J. David Irwin, Bill D. Carroll, Prentice Hall, Upper Saddle River, New Jersey 07458

[2] Digital Systems: Principles and Applications, Eight Edition, Ronald J. Tocci, Neal S. Widmer, Upper Saddle River, New Jersey Columbus, Ohio.

– References:

[3] Digital Techniques and Logic Circuits, Nguyen Nam Quan

[4] Digital Techniques, Nguyen Thuy Van, Science and Technology Publishing House, 1999

– Other:

10. Student Evaluation Criteria

10.1. Teamwork Evaluation

– Students work in group to implement course project. Each group include 3 to 5 students.

– Evaluate the capability of each member, combined of capabilities of team members and organizational capability of the leader (Have a look at the level of priority level point of 10%).

10.2. Evaluation criteria

No.	Partial Points	Rules	Weight Number	Notes
1	Attendance, Perception, Discussion Attitude, Diligence, Excercises.	–Attendances / Total Periods, 5%. –Done / Total Exercises, 5%.	10%	
2	Periodical Examinations	Students must report their course project progress regularly for the guidance teacher (1 to 2 weeks), 10%.	10%	
3	Course Report	–Students must report their course exactly to the form, 10%. –Exactly, completely design flow representation, 10%.	20%	
4	Report Respresentation to Remark and Evaluation Board	–Logically and Scientifically Representation, 10%. –Fluently Representation, Well Question Answering, 20%.	30%	
5	Course Product	Hardware (Or Combined To Software), 30%, Or Simulation Product (Optional), 20%.	30%	

10.3. Points Awarded

- Students who do not attend 80% of classes must not participated in the first examination.
- Students who do not report progress regularly for teachers as guided must not participated in the first examination.
- Students who do not report and represent to The Board must not participated in the first examination.
- The partial points is rounded to one decimal places.
- The course end points is rounded to integer part.

11. Point Grade: 10

12. Content

Week	Contents	Theoretical (Periods)	Practical (Periods)	Materials To Read	Student Duties
1	Chapter 1: Fundamentals Logic Gates, Logic Gate Function ICs.	3			Review Digital Electronics Knowledges
2	Chapter 1: Fundamentals Combinational Logic Circuits, Combination Logic Circuit ICs	3			Review Digital Electronics Knowledges
3	Chapter 1: Fundamentals Sequential Logic Circuits, Sequential Logic Circuit ICs	3			Review Digital Electronics Knowledges
4	Chapter 2: Logic Circuit Design Logic Circuit Design Purpose and Flow	3			Chapter 2 Learning Materials
5	Chapter 3: Example Design Digital and Programmable ICs Design	3			Chapter3 Learning Materials
6	Guidance Teacher Assigns Specified Projects To Student Groups		3		Given and Internet Materials
7	Students Self–Study At Home		3		Given and Internet Materials

8	Students Meet The Guidance Teacher To Report the Progress		3		Given and Internet Materials
9	Students Self–Study At Home		3		Given and Internet Materials
10	Students Meet The Guidance Teacher To Report the Progress		3		Given and Internet Materials
11	Students Self–Study At Home		3		Given and Internet Materials
12	Students Meet The Guidance Teacher To Report the Progress		3		Given and Internet Materials
13	Students Self–Study At Home		3		Given and Internet Materials
14	Students Meet The Guidance Teacher To Report the Progress		3		Given and Internet Materials
15	Students Self–Study At Home		3		Given and Internet Materials
	Students Prepare Reports, Products and Represent To The Evaluation and Remark Board				

Hanoi, / /2017

Approved by the Board of Rectors

The Faculty's Dean

The outline editor