



Electrónica Digital Bit a Bit: Fundamentos, Verilog y FPGA

 Instructor: [Angel Abusleme](#)

4,851 already enrolled

5 modules

Gain insight into a topic and learn the fundamentals.

4.7 ★

(69 reviews)

1 week to complete

at 10 hours a week

Flexible schedule

Learn at your own pace

What you'll learn

- ✓ Crear circuitos digitales utilizando Verilog.
- Crear circuitos digitales implementando una FPGA.

Skills you'll gain

- Computer Architecture Electronics Electrical Engineering Electronic Components Electronic Hardware Semiconductors Computer-Aided Design
Embedded Systems Electronic Systems Programming Principles Simulation and Simulation Software Computational Logic Application Specific Integrated Circuits
Hardware Design Engineering Design Process Schematic Diagrams Field-Programmable Gate Array (FPGA) [View less skills](#)

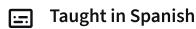
Details to know



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16 assignments



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Es desafiante y hasta atemorizante entender un circuito digital cuando observamos la cantidad de transistores que puede contener, y aún más difícil diseñarlo eficientemente para su implementación en un circuito integrado o una FPGA. Sin embargo, saber diseñar circuitos digitales simples nos abre las puertas para diseñar sistemas digitales más complejos a partir de estos.

El curso "Electrónica digital bit a bit: Aprendiendo fundamentos" introduce al mundo de los circuitos digitales, empezando con el sistema de numeración binario y las compuertas lógicas, para luego poder diseñarlos utilizando Verilog. Finalmente, se entregarán herramientas para optimizar los circuitos digitales eficientemente y se presentarán los circuitos aritméticos fundamentales del mundo digital.

La metodología del curso trabaja con videolecciones acompañadas de pequeños cuestionarios te ayudarán a reforzar tu aprendizaje en cuanto a la comprensión del funcionamiento de los circuitos digitales, su implementación con compuertas lógicas, y las herramientas de optimización y diseño más utilizadas.

[Read less](#)

Introducción a los circuitos lógicos

[Module details ^](#)

Module 1 • 3 hours to complete

Las láminas y figuras presentadas en este módulo han sido elaboradas basándose en el libro "Fundamentals of Digital Logic with Verilog Design" de los autores Stephen Brown y Zvonko Vranesic.

What's included

13 videos 2 readings 4 assignments

[Hide info about module content ^](#)

13 videos • Total 134 minutes

Variables y funciones • 12 minutes

Números binarios • 8 minutes

Tablas de verdad • 5 minutes

Compuertas lógicas OR, AND y NOT • 14 minutes

Álgebra Booleana • 14 minutes

Diagrama de Venn • 6 minutes

Síntesis de un circuito digital como suma de productos • 14 minutes

Síntesis de un circuito digital como producto de sumas • 11 minutes

Circuitos lógicos con NAND y NOR • 10 minutes

Ejemplos de diseño • 10 minutes

Circuitos multiplexores • 4 minutes

Introducción a las herramientas de CAD • 14 minutes

Compuertas lógicas XOR y XNOR • 5 minutes

2 readings • Total 20 minutes

Derechos reservados • 10 minutes

Introducción a los circuitos lógicos • 10 minutes

4 assignments • Total 45 minutes

Funciones lógicas y tablas de verdad • 10 minutes

Compuertas lógicas y álgebra Booleana • 10 minutes

Síntesis de circuitos digitales y multiplexores • 15 minutes

Herramientas CAD y compuertas lógicas XOR y XNOR • 10 minutes

Introducción a Verilog

[Module details ^](#)

Module 2 • 2 hours to complete

Las láminas y figuras presentadas en este módulo han sido elaboradas basándose en el libro "Fundamentals of Digital Logic with Verilog Design" de los autores Stephen Brown y Zvonko Vranesic.

What's included

6 videos 1 reading 2 assignments

[Hide info about module content ^](#)

6 videos • Total 76 minutes

Primeros pasos con Verilog • 15 minutes

Tipos de datos, conexiones, registros, asignaciones y procedimientos • 16 minutes

Operadores en Verilog • 13 minutes

Operadores condicionales en Verilog • 7 minutes

Case, casex, casez y loop for • 14 minutes

Testbench en Verilog • 9 minutes

1 reading • Total 10 minutes

Introducción a Verilog • 10 minutes

2 assignments • Total 50 minutes

Procedimientos y operadores en Verilog • 25 minutes

Operador condicional, case, if-else, for y testbench en Verilog • 25 minutes

Tecnología

Module 3 • 3 hours to complete

[Module details ^](#)

Las láminas y figuras presentadas en este módulo han sido elaboradas basándose en el libro "Fundamentals of Digital Logic with Verilog Design", de los autores Stephen Brown y Zvonko Vranesic, y el libro "CMOS VLSI Design A Circuits and Systems Perspective", de los autores Neil H. E. Weste y David Money Harris.

What's included

14 videos **1 reading** **4 assignments**

[Hide info about module content ^](#)

14 videos • Total 120 minutes

Transistores MOSFET • 16 minutes

Compuertas lógicas NMOS • 3 minutes

Compuertas lógicas CMOS • 9 minutes

Proceso de fabricación CMOS • 11 minutes

Circuitos con lógica negativa • 2 minutes

Chips estándar • 4 minutes

Dispositivos lógicos programables • 7 minutes

Chips a la medida • 6 minutes

Aspectos prácticos de los MOSFETs • 21 minutes

Dissipación de potencia, fan-in y fan-out • 8 minutes

Compuertas de transmisión CMOS • 8 minutes

Detalles de implementación en SPLDs, CPLDs y FPGAs • 6 minutes

Xilinx y Basys 3 • 6 minutes

Programar una FPGA con Vivado • 7 minutes

1 reading • Total 10 minutes

Tecnología • 10 minutes

4 assignments • Total 55 minutes

Circuitos digitales a partir de transistores • 20 minutes

Circuitos integrados digitales • 10 minutes

Transistores en circuitos integrados digitales • 15 minutes

Implementación optimizada de funciones lógicas

[Module details ^](#)

Module 4 • 2 hours to complete

Las láminas y figuras presentadas en este módulo han sido elaboradas basándose en el libro "Fundamentals of Digital Logic with Verilog Design" de los autores Stephen Brown y Zvonko Vranesic.

What's included

12 videos 1 reading 3 assignments

[Hide info about module content ^](#)

12 videos • Total 100 minutes

Mapas de Karnaugh • 23 minutes

Mapas de Karnaugh con 4 y 5 variables • 12 minutes

Estrategia de minimización • 8 minutes

Minimización de suma de productos • 4 minutes

Minimización de productos de sumas • 7 minutes

Funciones especificadas de forma incompleta • 9 minutes

Circuitos con múltiples salidas • 6 minutes

Síntesis multinivel: factorización • 8 minutes

Síntesis multinivel: descomposición funcional • 2 minutes

Circuitos multinivel con compuertas NAND y NOR • 3 minutes

Análisis de circuitos multinivel • 2 minutes

Herramientas CAD • 10 minutes

1 reading • Total 10 minutes

Implementación optimizada de funciones lógicas • 10 minutes

3 assignments • Total 45 minutes

Minimización de funciones con mapas de Karnaugh • 20 minutes

Funciones con don't cares y múltiples salidas • 10 minutes

Circuitos multinivel y herramientas CAD • 15 minutes

Representación numérica y circuitos de aritmética

[Module details ^](#)

Module 5 • 3 hours to complete

Las láminas y figuras presentadas en este módulo han sido elaboradas basándose en el libro "Fundamentals of Digital Logic with Verilog Design" de los autores Stephen Brown y Zvonko Vranesic.

What's included

11 videos 1 reading 3 assignments 1 plugin

[Hide info about module content ^](#)

11 videos • Total 122 minutes

Representación de números sin signo • 14 minutes

Suma de números sin signo • 14 minutes

Números con signo • 12 minutes

Suma y resta • 7 minutes

Complemento de la base y overflow aritmético • 13 minutes

Problemas de desempeño • 8 minutes

Sumadores rápidos • 11 minutes

Multiplicación • 12 minutes

Otras representaciones numéricas • 10 minutes

Código de caracteres ASCII • 5 minutes

Diseño de circuitos aritméticos con Verilog • 11 minutes

 1 reading • Total 10 minutes

Representación numérica y circuitos de aritmética • 10 minutes

 3 assignments • Total 50 minutes

Números sin y con signo • 20 minutes

Eficiencia de circuitos aritméticos • 15 minutes

Otras representaciones numéricas, paridad y Verilog • 15 minutes

 1 plugin • Total 5 minutes

Encuesta Final • 5 minutes

Instructor

Instructor ratings  4.9 ★ (29 ratings)



Angel Abusleme

Pontificia Universidad Católica de Chile

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 Universitat Autònoma de Barcelona

Digital Systems: From Logic Gates to Processors

This course provides a comprehensive introduction to digital systems. It covers the basic principles of logic gates, combinational logic, sequential logic, and state machines. The course also explores the design of digital systems using VHDL and Verilog.

[Free Trial](#)

 L&T EduTech

Fundamentals of Digital Design for VLSI Chip Design

This course focuses on the fundamental concepts of digital design for Very Large Scale Integration (VLSI) chip design. It covers topics such as digital logic, state machines, and the design of complex digital systems.

[Free Trial](#)

 L&T EduTech

Design of Digital Circuits with VHDL Programming

This course teaches the basics of VHDL programming for digital circuit design. It covers the syntax and semantics of VHDL, as well as how to use it to design various digital logic circuits.

[Free Trial](#)

 University of Colorado Boulder

FPGA Design for Embedded Systems Specialization

This specialization covers the design of Field-Programmable Gate Arrays (FPGAs) for embedded systems. It includes courses on FPGA architecture, design tools, and practical projects.

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★ 4.7 69 reviews



FC

★ 5 · Reviewed on May 14, 2024

Excelente curso, muy claras las explicaciones, el profesor excelente y muy agradable en su locución

AC

★ 4 · Reviewed on Sep 8, 2024

haria mas ejemplos pera rendir mas explicito el curso

AG

★ 5 · Reviewed on Nov 5, 2025

Muy buen curso, lo pude entender bien y tenia buenos ejemplos

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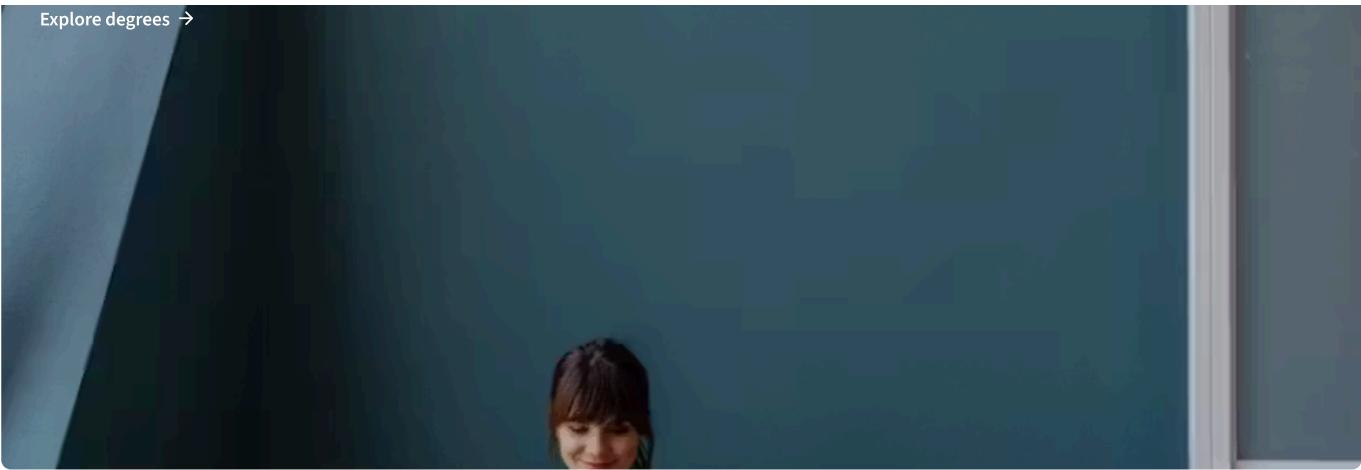
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Frequently asked questions

^ When will I have access to the lectures and assignments?

To access the course materials, assignments and to earn a Certificate, you will need to purchase the Certificate experience when you enroll in a course. You can try a Free Trial instead, or apply for Financial Aid. The course may offer 'Full Course, No Certificate' instead. This option lets you see all course materials, submit required assessments, and get a final grade. This also means that you will not be able to purchase a Certificate experience.

^ What will I get if I purchase the Certificate?

When you purchase a Certificate you get access to all course materials, including graded assignments. Upon completing the course, your electronic Certificate will be added to your Accomplishments page - from there, you can print your Certificate or add it to your LinkedIn profile.

^ Is financial aid available?

Yes. In select learning programs, you can apply for financial aid or a scholarship if you can't afford the enrollment fee. If fin aid or scholarship is available for your learning program selection, you'll find a link to apply on the description page.

More questions



[Visit the learner help center](#)

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Artificial Intelligence (AI)	Google Cybersecurity Certificate	Business	Career Aptitude Test
Cybersecurity	Google Data Analytics Certificate	Computer Science	Examples of Strengths and Weaknesses for Job Interviews
Data Analytics	Google IT Support Certificate	Data Science	High-Income Skills to Learn
Digital Marketing	Google Project Management Certificate	Education & Teaching	How Does Cryptocurrency Work?
English Speaking	Google UX Design Certificate	Engineering	How to Highlight Duplicates in Google Sheets
Generative AI (GenAI)	IBM Data Analyst Certificate	Finance	How to Learn Artificial Intelligence
Microsoft Excel	IBM Data Science Certificate	Healthcare	Popular Cybersecurity Certifications
Microsoft Power BI	Machine Learning Certificate	Human Resources (HR)	Preparing for the PMP Certification
Project Management	Microsoft Power BI Data Analyst Certificate	Information Technology (IT)	Signs You Will Get the Job After an Interview
Python	UI / UX Design Certificate	Marketing	What Is Artificial Intelligence?

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