CSD1100

Introduction

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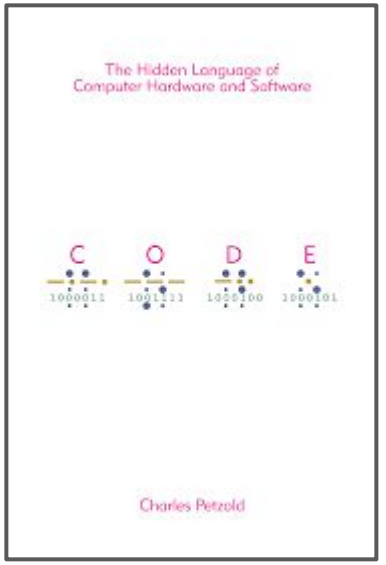
1. General Module Information

- Module: CSD1100/CSD1101 Computer Environment
- Pre-requisite(s) for other modules
  - CSD2180 Operating Systems,
  - CSD3115 Low-level Programming
- Module Co-Coordinator
  - Name: Vadim Surov
  - Phone: 1940
  - Email: vsurov@digipen.edu
- Recommended Resources
  - The Hidden Language of Computer Hardware and Software, CODE, Microsoft Press, 2000, (ISBN 0-7356-1131-9)



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1. General Module Information

- This module provides students with a solid understanding of the **fundamental elements** on which computers are based.
- Topics covered include **number systems, representation of numbers in computation, basic electricity, electric circuits, digital systems, logic circuits, data representation, digital memory, computer architecture, and operating systems**.
- This knowledge eliminates some of the “mysteries” about hardware and provides students with a well-rounded understanding of computers.
- The latter stages of the module focus on **assembly programming**, which enhances the student’s understanding of how the computer works at a fairly low-level.

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3.1 Topics covered in the module 1/3

Topic	Details	Contact hours
Introduction. Encoding	Encoding of integers in machines	6
Encoding. Conversions	Conversions. Binary arithmetic	6
Boolean algebra and expression simplification	Boolean algebra, truth tables, POS and SOP	6
Logic gates and arithmetic unit	Using logic gates AND, OR, NOT and arithmetic unit	6
Signed binary numbers	Signed representation – signed magnitude and one's complement Eliminating borrowing when performing subtraction. Performing subtraction using the addition operation	6

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3.1 Topics covered in the module 2/3

Floating-point number	Floating point number representation of real numbers. IEEE 754 single precision and double Precision. Rounding errors due to floating point representation	6
Memory	Understand how different data types such as short, int, float, pointer etc are arranged in memory. Little and Big Endianness. RS-Flip Flops and Data-Flip Flops. How storage elements are implemented using the flip-flops gates. Address decoding	6
Computer Architecture And Operating System	How the system bus is constructed with address, control and data buses. Registers as a storage element that resides within the CPU in contrast with memory. Types of Instructions. How an executable program is loaded into memory before execution. How a computer system boots up. An overview of the responsibilities of the OS.	6

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3.1 Topics covered in the module 2/3

Assembly Programming 1	Introduction to the Assembly Programming for x86-64 architecture: the instruction set, the organization of the memory, performing simple arithmetic	6
Assembly Programming 2	Branching and looping structures in assembly programming	6
Assembly Programming 3	Accessing arrays. Pointers referencing and dereferencing	6
Assembly Programming 4	Functions. Function calls, argument passing. Conventions	6

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3.2 Learning Activities

Week	Activity Type	Topics	Hrs
1	Lecture	Introduction. Encoding	4
	Lab	Introduction. Encoding	2
	Assignment	Introduction. Encoding	5
	Preparatory work	Introduction. Encoding	2
2	Lecture	Encoding. Conversions	4
	Lab	Encoding. Conversions	2
	Assignment	Encoding. Conversions	5
	Preparatory work	Encoding. Conversions	2
3	Lecture	Boolean algebra and expr. simplification	4
	Lab	Boolean algebra and expr. simplification	2
	Assignment	Boolean algebra and expr. simplification	5
	Preparatory work	Boolean algebra and expr. simplification	2
etc			

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5.1 Assessment Tasks

Assessment Task	Weighting	Tentative week/due date
Assignments Students will independently work on assignments to translate the knowledge acquired to find solutions to specified problems.	30%	Week 1-13
Quizzes Students individually take short written tests to determine their comprehension of topics discussed in lectures.	15%	Week 1-13
Midterm Test Students individually take a written test to evaluate their comprehension of topics discussed in lectures during the first half of the trimester.	25%	Week 6
Final Test Students individually take a written test to evaluate their comprehension of topics discussed in lectures during the entire the trimester.	30%	Week 14/15

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Grades

LETTER GRADE	GRADE POINT	DESCRIPTION	REMARKS
A+	5.0	Excellent attainment of learning outcomes	
A	5.0		
A-	4.5		
B+	4.0	Very Good attainment of learning outcomes	
B	3.5		
B-	3.0		
C+	2.5	Good attainment of learning outcomes	
C	2.0		
D+	1.5	Adequate attainment of learning outcomes	
D	1.0		Minimum grade required for undergraduate students to earn credit
F	0.0	Failed to attain learning outcomes	

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Pass Requirements

- A “D” grade or above is considered as “Pass” and an “F” grade is considered as “Fail”.
- Students with grades “D+” or “D” will be given the option to re-sit or re-module depending on the cohort of students but the maximum GPA for the repeated attempt will be capped at 2.0.
- Marks are final after endorsement by the Board of Examiners.

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5.3. Late Submission

- Assignments:
  - The due day/time will be published on the class website for each assignment.
  - **Late submissions and resubmissions are not allowed.**
  - Exceptions/Excuses:
    - Updated specs (Read announcements about it)
    - MC (Submit a certificate form your doctor to the Registrar Office (RO), registrar.sg@digipen.edu)
    - Participation in conferences, mandatory service in army, and other events (must be approved by RO)
- Quizzes:
  - No late quizzes. If you have an excuse, your quiz will be excluded.

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6 Appendix A: Attendance Policy 1/2

Attending lectures and laboratory classes in this module is mandatory and it can impact the final grade in the module:

- Student more than 15 minutes late to class will be marked as absent for that entire class.
- Student may not leave the class early without the instructor's permission.
- Student absent from all classes without explanation for a period of 14 calendar days would receive a Letter of Warning from the Registrar's Office. The student must reply with the reasons of absence and resume attending classes within the next 14 calendar days to avoid being withdrawn from the Institute.
- To apply for your absences to be excused, please submit your documents (Medical Certificate, Reservist notice, etc.) to RO within 7 calendar days of your return.
- Unexcused absences would result in the following penalty to your final grade.

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6 Appendix A: Attendance Policy 2/2

Number of classes conducted per week in a module	Total number of sessions in 12 instructional weeks	1 letter grade down for the number of unexcused absences	2 letter grade down for the number of unexcused absences
1	12	2	4
2	24	4	8
3	36	6	12

Example: A module was scheduled to meet once a week and a student had 2 unexcused absences. The student then attained a final grade of “A-“ for the module, but his final letter grade was downgraded to “B+” due to the penalty.

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References

- Module Profile
- Moodle

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