

Metropolitan State University of Denver

Regular Course Syllabus

CS - 1400 - Computer Organization 1

Fall 2016

Status	completed
Tracking:	NLAS1617-40
Department	Mathematical and Computer Sciences, Department of
Prefix:	CS
Course Number:	1400
Course Type:	Computer Science
Course Title:	Computer Organization 1
Transcript Course Title:	Computer Organization 1
Equivalent/ Crosslisted?	
List all equivalent courses:	
List all crosslisted courses:	
Check All That Apply:	Required for Major, Elective
Credit Hours:	4
Schedule Type:	Lecture
Grade Mode:	Letter
Lecture:	60
Lab:	
Internship:	
Practicum:	
Other:	
Additional Student Work Hours per course:	120
Variable topics umbrella course:	No
If yes, number of credits/ repeats allowed	
Specified repeatable course:	No
If yes, number of credits/ repeats allowed	
Prerequisite(s):	An intermediate algebra course or one and one-half years of secondary school algebra or equivalent and appropriate score on the mathematics pre-assessment placement test or higher-level math course with a grade of "C" or better
Corequisite(s):	
Prerequisite(s) and/or Corequisite(s):	
Banner Prerequisite(s):	A02 FOR MIN. SCORE OF 22 OR S02 FOR MIN. SCORE OF 500 OR (52 FOR MIN. SCORE OF 090 AND 54 FOR MIN. SCORE OF 022) OR (52T FOR MIN. SCORE OF 090 AND 54 FOR MIN. SCORE OF 022) OR (52T FOR MIN. SCORE OF 090 AND 54T FOR MIN. SCORE OF 022) OR S12 FOR MIN. SCORE OF 530 OR MAT 099 FOR LEVEL UG WITH MIN. GRADE OF C OR MAT 099 FOR LEVEL UG WITH MIN. GRADE OF T OR MTH 1110 FOR LEVEL UG WITH MIN. GRADE OF C OR MTH 1110 FOR LEVEL UG WITH MIN. GRADE OF T OR MTH 1400 FOR LEVEL UG WITH MIN. GRADE OF C OR MTH 1400 FOR LEVEL UG WITH MIN. GRADE OF T OR MTH 1410 FOR LEVEL UG WITH MIN. GRADE OF C OR MTH 1410 FOR LEVEL UG WITH MIN. GRADE OF T OR MTH 2410 FOR LEVEL UG WITH MIN. GRADE OF C OR MTH 2410 FOR LEVEL UG WITH MIN. GRADE OF T OR MAT 055 FOR LEVEL UG WITH MIN. GRADE OF C OR MAT 055 FOR LEVEL UG WITH MIN. GRADE OF T
Banner Corequisite(s):	

CS 1400 - Fall 2016

Banner Prerequisite(s) and/or Corequisite(s):	
Level	
Class	
Program/Major	
Student attribute	
Catalog Course Description:	In this course, students will study the internal organization, characteristics, performance and interactions of a computer system's functional components. Binary codes and binary arithmetic, digital logic, central processor organization, instruction set architecture, input/output fundamentals, and memory architecture are covered.
Required Reading and Other Materials will be equivalent to:	Clements Alan. (2006). <i>The Principles of Computer Hardware, 4th edition</i> . New York, NY: Oxford University Press
Specific, Measurable Student Behavioral Learning Objectives:	<p>Upon completion of this course the student should be able to</p> <ol style="list-style-type: none"> 1. Convert numerical data from one format to another. 2. Perform binary arithmetic operations. 3. Use AND, OR, NOT, and XOR logical elements in the design of combinational and sequential logical circuits. 4. Describe instruction set architecture and the functionality of the central processing unit. 5. Describe input/output organization and how interrupts are used to implement input/output control and data transfers. 6. Discuss various bus technologies and compare their features and performance. 7. Explain the cost/performance tradeoffs of the memory hierarchy
Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/ Internship	<ol style="list-style-type: none"> I. Data Representation and Digital Logic <ol style="list-style-type: none"> A. Binary representation of data B. Binary signed and unsigned arithmetic C. Range, precision, and errors in floating-point arithmetic D. Introduction to digital logic (logical elements, flip-flops) E. Boolean algebra and logical expressions F. Design of logical circuits II. Computer Architecture and Organization <ol style="list-style-type: none"> A. Overview of the history of the digital computer B. Introduction to instruction set architecture and system architecture C. Processor architecture – instruction types, memory addressing modes, register sets, arithmetic logic unit D. Processor structures – memory-to-register, load/store, stack and accumulator processors III. Interfacing and Input/Output Strategies <ol style="list-style-type: none"> A. Input/Output fundamentals: spinning (polling) and interrupt modes B. Interrupt mechanisms: vectored and prioritized, interrupt acknowledgment and masking C. Buses: bus transactions and protocols, bus arbitration IV. Memory Architecture <ol style="list-style-type: none"> A. Primary, secondary and tertiary memories and their technologies B. Memory hierarchy, latency and throughput
Evaluation of Student Performance	<p>A combination of the following:</p> <ol style="list-style-type: none"> 1. Homework Assignments 2. Quizzes and Examinations 3. Final examination <p>Written communication skills will be applied in this course.</p>
Learning Objectives	Program Student Learning Outcomes Assessment

CS 1400 - Fall 2016

	<p>Students should achieve the Program Student Learning Outcomes (Program SLOs) by the time of graduation. Each individual Program SLO is assessed by selecting one or more course SLOs that contribute to the evaluation of that one Program SLO.</p> <ol style="list-style-type: none"> 1. Program SLO i: An ability to use current techniques, skills, and tools necessary for computing practices. <ul style="list-style-type: none"> Course SLO #4: Describe instruction set architecture and the functionality of the central processing unit. Course SLO #7: Explain the cost/performance tradeoffs of the memory hierarchy. 2. Program SLO j: An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. <ul style="list-style-type: none"> Course SLO #1: Convert numerical data from one format to another. Course SLO #2: Perform binary arithmetic operations. Course SLO #3: Use AND, OR, NOT, and XOR logical elements in the design of combinational and sequential logical circuits. 3. Program SLO k: An ability to apply design and development principles in the construction of software systems of varying complexity. <ul style="list-style-type: none"> Course SLO #5: Describe input/output organization and how interrupts are used to implement input/output control and data transfers. Course SLO #6: Discuss various bus technologies and compare their features and performance.
Distribution of Credit Hours	(4 + 0)
Steps	
Originator	
Lindsay Packer	APPROVED 10/03/2016 04:28PM
Department Curriculum Committee Chair	
Clark Dollard	APPROVED 10/05/2016 03:21PM
Department Chair	
Lindsay Packer	APPROVED 10/06/2016 10:00AM
Dean's Office Tracking Assignment	
Kelsey Smith	APPROVED 10/06/2016 03:06PM
AVP Academic and Student Affairs	
Bernice Harris	APPROVED 12/12/2016 02:06PM