

June 1, 2016

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METROPOLITAN STATE UNIVERSITY OF DENVER
Office of Academic and Student Affairs

REGULAR COURSE SYLLABUS

College of: Letters, Arts, and Sciences

Department: Mathematical and Computer Sciences

Prefix & Course Number: CS4000 Crosslisted With*: _____

Course Title: Computer System Reliability

Transcript Course Title (30 characters): Computer System Reliability

Check All That Apply: Required for Major: _____ Required for Minor: _____ Specified Elective:

Required for Concentration: _____ Elective: _____ Service Course: _____

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

Federal Credit Hour Definition: A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than:

(1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward to the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 4 (4+0) Schedule Type: _____ Grade Mode: _____

Face-to-Face or Equivalent Hours per course:

Lecture 60 Lab 0 Internship 0 Practicum 0 Other: 0

Additional Student Work Hours per course: 0

Variable topics umbrella course: No Yes _____ If Yes, number of credit hours allowed _____

Specified repeatable course: No Yes _____

Prerequisite(s): CPE3400 (Signal and System), CS2400 (Computer Organization 2), CPE3330 (Digital Circuit II) with grade "C" or better

APPROVED:

<u>LPacker</u>	<u>09.19.2016</u>
Department Chair OR Program Director	Date
<u>Sandra Lopez-Perez</u>	<u>2/24/17</u>
Dean OR Associate Dean	Date
<u>Chad Davis</u>	<u>6-2-17</u>
Associate VP, Academic Affairs	Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number: CS4000

June 1, 2016

Corequisite(s): _____

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Prerequisite(s) or Corequisite(s): _____

Banner Enforced Coding:

Prerequisite(s): CS2400, CPE3330, CPE3400

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Registration restrictions: Level UG Class _____ Program/Major _____ Student attribute _____

Catalog Course Description:

The course covers theoretical and practical achievements oriented to make computing reliable and fault tolerant. Errors models are explained that are used both in production and in computer testing. Testing methodologies in production and the structure of the automatic test systems (ATS) are presented. Algorithmic explanation of the error detection and correcting codes is provided. Formal definitions and practical measure of reliability, fault tolerance and computer security are described.

Specific Variable Topics Course Description (if applicable, umbrella course description included above):

Required Reading and Other Materials will be equivalent to:

No required book. Different materials will be provided.

Required Calculator: TI-83 (Any version)

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Understand the error models in digital electronics and computing functionality
2. Describe testing methods in computer production
3. Understand the usage of automatic test systems
4. Explain the error detecting and correcting codes
5. Explain the methods providing confidentiality, authentication, information integrity, non-repudiation in computer security
6. Understand formal presentation of reliability and fault-tolerance

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision)

- I. Digital electronics fault models
 - A. Stuck-at faults
 - B. Bridge faults
 - C. Delay faults.
- II. Computer functionality error models
 - A. Systematic errors
 - B. Intermittent errors
 - C. Burst errors
- III. Automatic test systems in production
 - A. Functional testing
 - B. In-circuit functional and parametric testing
 - C. Signature analysis.
- IV. Error detecting and correcting codes



- A. Parity detecting codes
- B. Parity correcting codes
- C. Polynomial detecting and correcting codes.
- V. Build-in testing subsystem
- VI. Components of computer security
 - A. Confidentiality
 - B. Authentication
 - C. Information integrity and non-repudiation
- VII. Formal presentation of reliability and fault-tolerance

Evaluation of Student Performance:

1. Homework Assignments
2. Examinations; midterm and final exams.
3. Project

As determined by the instructor. Written communication skill will be applied in this course.