Reedley College   **Spring 2018**
CSCI 26 – Discrete Mathematics for Computer Science

SYLLABUS

Schedule No	52052				
	Hybrid Web Class				
Required On Campus	Week 01	1/10 Wednesday	6 – 8 pm	FEM8	Orientation
Meetings	Week 05	2/07 Wednesday	6 – 8 pm	FEM8	Test 1
	Week 09	3/07 Wednesday	6 – 8 pm	FEM8	Test 2
	Week 13	4/11 Wednesday	6 – 8 pm	FEM8	Test 3
	Week 17	5/09 Wednesday	6 – 8 pm	FEM8	Test 4
	Week 18	5/16 Wednesday	6 – 8 pm	FEM8	Final
Instructor	Sharon Wu				
Phone	638-0300 ex-3497				
Office Hours	Monday 11 – 11:50 am (room: FEM 1D)				
	Friday 8 – 09:50 am (room: PHY 76)				
	or By appointment				
Office	FEM 1D				
E-mail	sharon.wu@reedleycollege.edu				

Course Objectives:

In the process of completing this course, you will be able to
1. Determine the truth-value of propositions using truth tables.
2. Prove mathematical principles using mathematical induction method.
3. Use the language of mathematics: sets, sequences, number systems, relations, and functions.
4. Convert numbers between decimal number system, binary number system, and hexadecimal number system.
5. Write algorithms for solutions to problems and analyze the complexity of algorithms.
6. Apply the pigeonhole principle to determine if an item has a given property or not.
7. Count objects using permutation and combination methods.
8. Understand and apply the fundamentals of graph theory.
9. Build and traverse binary trees.
10. Apply the binomial theorem to independent events and Bayes' theorem to dependent events.

Course Outcomes:

Upon completion of this course, you will be able to:
1. Apply fundamental proving techniques of discrete mathematics in computer science. These techniques include proofs by mathematical induction.
2. Use mathematics terminology, such as sets, sequences, number systems, relations, and functions.
3. Demonstrate knowledge of algorithms, recursive algorithms, and the analysis of algorithms.
4. Give precise statements about the growth of functions and the complexity of algorithms using the big O, omega, and theta notations.
5. Write C++ programs to implement various algorithms.
6. Demonstrate different traversal methods for trees and graphs.
7. Apply the binomial theorem to independent events and Bayes' theorem to dependent events.

Course Outline:

A. Logic and Proofs
    1. Propositions
    2. Conditional Propositions and Logical Equivalence
    3. Proofs
    4. Mathematical Induction
B. Language of Mathematics
    1. Sets
    2. Sequences and Strings
    3. Number Systems
    4. Relations
    5. Functions
C. Algorithms: Counting Methods, and Recurrence Relations
    1. Notation of Algorithms

      2. The Euclidean Algorithm and Program Implementation
      3. Recursive Algorithms and Program Implementation
      4. Complexity of Algorithms
  D. Counting Methods and the Pigeonhole Principle
      1. Permutations, Combinations, and Program Implementation
      2. Binomial Coefficients and Combinatorial Identities
      3. The Pigeonhole Principle
  E. Graph Theory and Trees
      1. Paths and Cycles
      2. Hamiltonian Cycles and the Traveling Salesperson Problem
      3. Representations of Graphs
  F. Trees
      1. Terminology and Characterizations of Trees
      2. Binary Trees and Program Implementation
      3. Tree Traversals and Program Implementation
  G. Probability
      1. Introduction to Probability
      2. Unions and Intersections
      3. Conditional Probability and Independence
      4. Random Variables
      5. Probability Calculations in Hashing
      6. Conditional Expectations, Recurrences, and Algorithms

Lab Content:
Following lecture content is practiced by students in computer laboratory exercises.
* Algorithms: counting methods and recurrence relations.
* Graph theory.
* Tree traversal.

Course Prerequisite:
Programming Concepts and Methodology I (CSCI 40) or
Programming for Scientists and Engineers (ENGR 40)

Textbook:
Discrete Mathematics and Its Applications, 7th Edition, By Kenneth Rosen, McGraw Hill

Learning Management System: CANVAS:
CANVAS is used to post course information, assignments, and announcements.
To log-in Reedley College CANVAS:
    Username: Your 7-digit student ID number.
    Password: If you have not previously changed your password, it is:
        First name initial (upper case) + *last name initial* (lowercase) + *date of*
  Birth (mmddyy)
      Example: John Smith born on July 9th of 1988   Password =Js070988

Homework Assignment: McGraw Hill Connect
Homework is assigned using McGraw Hill Connect.
You will access McGraw Hill Connect from CANVAS.

Programming Assignments:
Programming assignments should be written using C++ language. For each assignment, submit all
related program files and program input/outputs. Programs are graded using following criteria:
    1.   Correct syntax of computer language
    2.   Program design and logic flow
    3.   Documentation and readability
    4.   Test results

Tests:
There are four on-campus tests and the final exam.

Each test is **100** points. Early tests can be arranged with a very good reason. A more difficult late test can only be arranged if you have an excuse verified by an impartial party (i.e., a doctor or a court clerk).

Tests will be given on following dates:

Week 05	2/07 Wednesday	6 – 8 pm	FEM8	Test 1
Week 09	3/07 Wednesday	6 – 8 pm	FEM8	Test 2
Week 13	4/11 Wednesday	6 – 8 pm	FEM8	Test 3
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Week 18	5/16 Wednesday	6 – 8 pm	FEM8	Final

You need to show <u>a photo ID</u> when taking tests on campus.

Quiz:
There will be an online quiz at end of each chapter.

Grading:
60% of your final grade points are from the average of test scores.
15% of your final grade points are from chapter homework assignments.
10% of your final grade points are from the average of online chapter test scores.
05% of your final grade points are from online discussion scores.
10% of your final grade points are from program assignments.

Final letter grade is assigned using following scale:

90-100	points	A	60- 69	points	D
80- 89	points	B	< 60	points	F
70- 79	points	C			

Important Dates:

Class begin	Monday	1/08/2018
Last day to register	Friday	1/26/2018
Last day to drop this class to avoid a "W"	Friday	1/26/2018
Last date to drop this class	Friday	3/09/2018
No classes, campus is closed		
Martin Luther King Jr. Day	Monday	1/15/2018
Lincoln Day	Friday	2/16/2018
Washington Day	Monday	2/19/2018
Spring Recess	M-F	3/26 – 3/30
Final Exam	**Wednesday**	**5/16/2018** **6:00 – 8:00 pm FEM 3**

Attendance (Also see Attendance Policy under Academic Regulations in Class Schedule):
This is a hybrid class. You are required to be on campus for the orientation, and tests. See page 1 for date, time, and room number.

Student Conduct (Also see Student conduct under Campus Policies in Class Schedule):
Students are expected to conduct themselves in a responsible manner. Specific rules and regulations have been established in Board Policy 5410. A copy of this policy is available in the college library, the Admissions Office, the Vice President of Student Services, the Vice President of Instruction's Office, and in the Student Activities Office. Failure to adhere to the accepted standards will result in disciplinary action.

Plagiarism and Cheating Policy (See Cheating and Plagiarism under Campus Policies):
Cheating and plagiarism is prohibited in the class. Incidents of cheating and plagiarism will result a failing grade on the particular examination or assignment in question.

<u>Accommodations</u>

    If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.