Discrete Mathematics II MATH 4328.001
Department of Mathematics & Statistics

Spring 2018

A. COURSE INFORMATION

Course number/section: MATH 4328.001
Class meeting time: MWF 12:30-1:45 PM
Class location: OCNR-133
Course Website: https://bb9.tamucc.edu/

B. INSTRUCTOR INFORMATION

Instructor: Pranava K. Jha
Office location: EN 316-P
Office hours: MWF 10:00 am to 12:00 noon
Telephone: (361) 825-3712
E-mail: Pranava.jha@tamucc.edu
Appointments: e-mail me to make appointments outside the office hours

C. COURSE DESCRIPTION

Catalog Course Description
A continued study of topics from Discrete Mathematics-I with topics that have strong applications to computer science and mathematics. Additional topics include recurrence relations, formal languages and finite-state machines.

Extended Course Description
None

D. PREREQUISITES FOR THE COURSE

Pre-requisites: MATH 2305 and COSC 2437
Co-requisite: None.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Optional Textbook(s)
None

Supplies
Paper and pen/pencil
F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Apply regular and strong mathematical induction. Demonstrate knowledge of the well-ordering of the integers and its equivalence with mathematical induction.
2. Use the characteristic polynomial to synthesize closed-form solutions for selected recursively-defined sequences.
3. Comprehend selected properties of graphs, their spanning trees, and their representations as matrices.
4. Demonstrate the ability to explain finite-state automata, regular expressions, regular languages and their equivalence.
5. Exhibit knowledge of other topics to include (as time permits) the halting problem, the use of cardinality in demonstrating non-computability, and public-key cryptography.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Methods and activities for instruction include: Lectures, assignments and quizzes.

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm 1</td>
<td>20%</td>
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<tr>
<td>Midterm 2</td>
<td>20%</td>
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<tr>
<td>Quiz</td>
<td>25%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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<td>Other activities</td>
<td>5%</td>
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Grading Scale: Grades will be no stricter than
A = 90.00 – 100%
B = 80.00 – 89.99%
C = 70.00 – 79.99%
D = 60.00 – 69.99%
F = below 60%
I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Week/Date</th>
<th>Topic</th>
<th>Chapter(s)</th>
<th>Quiz</th>
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<tbody>
<tr>
<td>Wk. 1 (1/16 – 1/19)</td>
<td>Review of basic logic</td>
<td>Chap. 2</td>
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<tr>
<td>Wk. 2 (1/22 – 1/26)</td>
<td>Multiple quantifiers</td>
<td>Sec. 3.3, 3.4</td>
<td>Quiz 1</td>
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<tr>
<td>Wk. 3 (1/29 – 2/2)</td>
<td>Proof and counterexample</td>
<td>Sec. 4.4, 4.5, 4.6</td>
<td>Quiz 2</td>
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<tr>
<td>Wk. 4 (2/5 – 2/9)</td>
<td>Correctness of algorithms</td>
<td>Sec. 5.4, 5.5</td>
<td>Quiz 3</td>
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<tr>
<td>Wk. 5 (2/12 – 2/16)</td>
<td>Recurrences</td>
<td>Sec. 5.8, 5.9</td>
<td>Quiz 4</td>
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<tr>
<td>Wk. 6 (2/19 – 2/23)</td>
<td>Review and Midterm 1</td>
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<td>Wk. 7 (2/26 – 3/2)</td>
<td>Modular arithmetic</td>
<td>Sec. 8.4</td>
<td>Quiz 5</td>
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<tr>
<td>Wk. 8 (3/5 – 3/9)</td>
<td>Partial order</td>
<td>Sec. 8.5</td>
<td>Quiz 6</td>
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<tr>
<td>3/12 - 3/16</td>
<td><strong>Spring Break</strong></td>
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<td>Wk. 9 (3/19 – 3/23)</td>
<td>Probability axioms</td>
<td>Sec. 9.8, 9.9</td>
<td>Quiz 7</td>
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<tr>
<td>Wk. 10 (3/26 – 3/30)</td>
<td>Graph isomorphism</td>
<td>Sec. 10.3, 10.4</td>
<td>Quiz 8</td>
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<tr>
<td>Wk. 11 (4/2 – 4/6)</td>
<td>Review and Midterm 2</td>
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<td>4/6 (Fri)</td>
<td><strong>Last day to drop a class</strong></td>
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<td>Wk. 12 (4/9 – 4/13)</td>
<td>Analysis of algorithms</td>
<td>Sec. 11.2, 11.3, 11.4</td>
<td>Quiz 9</td>
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<td>Wk. 13 (4/16 – 4/20)</td>
<td>Regular expressions</td>
<td>Sec. 12.1</td>
<td>Quiz 10</td>
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<td>Wk. 14 (4/23 – 4/27)</td>
<td>Finite automata</td>
<td>Sec. 12.2</td>
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<td>Wk. 15 (4/30 – 5/2)</td>
<td>Review</td>
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<td>5/4, 5/7 – 5/10</td>
<td>Final Exam</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness

Attendance will be taken each class. For most students attending class is a faster way of learning the material than trying to catch up on missed material solely from the book. Tardiness is often disruptive to the whole class and is not appreciated. If you are delayed and arrive late for class please do so quietly. Usually the topic/technique of the day is introduced in the first few minutes of class; missing that part usually means that you will be lost all class.
Late Work and Make-up Exams
Missed assignments or quizzes cannot be made up. Make-up exams will not be given.

Extra Credit
There may be some extra credit work in this class.

Cell Phone Use
Cell phones and such must be turned off before class. Each time your phone rings during class, your course grade goes down by 1%.

Laptop Use
You may use a laptop to take notes during lecture. Distracting other students by surfing the web is not an acceptable behavior.

Food in Class
No food

Missed Exam
No missed exam

Participation
Extra credit for good questions and sharp answers

K. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

• Classroom/Professional Behavior Texas A&M University–Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.
• **Statement of Civility**
  Texas A&M University–Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• **Deadline for Dropping a Course with a Grade of W (University)** I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. **Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.** Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

• **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html.

  For assistance and/or guidance in the grade appeal process, students may contact the Deans office in the college in which the course is taught or the Office of the Provost.

• **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.
If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- **Statement of Academic Continuity** In the event of unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi this course would continue through Blackboard and/or e-mail. In addition the syllabus and class activities may be modified to allow continuation of the course. University Facilities (i.e. e-mail, web sites, and Blackboard) will be operational within two days of closing the physical campus. However, students need to make certain that the course instructor has a primary and secondary way of contacting each student.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.