Syllabus for CSCI 3310-01: Discrete Data Structures  
Spring 2017

Course Information

Course description. An introduction to some of the more important concepts, techniques, and structures of discrete mathematics. It provides a bridge between computer science and mathematics. Topics include functions and relations, sets, countability, groups, graphs, propositional and predicate calculus, and permutations and combinations. Students will be expected to develop simple proofs for problems drawn primarily from computer science and applied mathematics.

- Instructor: Andrew Winslow (andrew.winslow@utrgv.edu).
- Teaching assistant: Cameron Chalk (cameron.chalk01@utrgv.edu).
- Course webpage: http://andrewwinslow.com/3310/.
- Office hours: 3:00-5:00 MW, 9:30-10:30 R in ENGR 3.279.
- Final exam: 1:15-3:00 on Monday, May 8.
- Feedback: http://sayat.me/AndrewWinslow.

Prerequisites. Students must have completed both:
- MATH 2413 (Calculus I) with grade of C or better.
- CSCI/CMPE 1370 or CSCI/CMPE 1378 (Engineering Computer Science I).

Textbook. The course textbook is an online, interactive zyBook, available for $48 via the following steps:

2. Enter zyBook code “UTRGVCSCI3310WinslowSpring2017”.
3. Click Subscribe.

Note that the course does not use the textbook directly in any way. For additional reference and source of practice problems, see the resources on the course webpage.

Course schedule and topics. Below is a rough schedule of the course and topics covered; the exact schedule will be maintained and updated on the course webpage.

- Weeks 1-4: Logic and proofs.
• **Weeks 5-7**: Sets, functions, integers.
• **Weeks 8-11**: Induction and computation.
• **Weeks 12-13**: Counting.
• **Weeks 14-16**: Graphs and trees.

**Grading.** The course grade is determined in three parts:

• **Quizzes**: Roughly fortnightly in-class 15-minute paper-\&-pencil individual tests.
• **Final Exam**: 1 in-class 105-minute paper-\&-pencil individual test.
• **Exercises**: Roughly twice-weekly 10-minute paper-\&-pencil group exercises.

Quizzes are not necessarily announced in advance. Each part determines a portion of the final grade as follows:

• **Quizzes**: 60% total (evenly divided across quizzes).
• **Final Exam**: 30%.
• **Exercises**: 10% total (evenly divided across exercises).

The final grade is determined by computing the weighted total (out of 100%) of all three parts and applying the following percentage-to-letter-grade function: 90%-100% → A, 80%-89% → B, 70%-79% → C, 60%-69% → D, 0%-59% → F. Grades may be curved to reflect the overall performance of the class.

**Feedback.** Constructive feedback about the course is welcome at any time. Anonymous feedback can be given using sayat.me.

### Course Policies

**Attendance.** Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. The UTRGV attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics, for observance of religious holy days, or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**Late work.** In-class activities submitted after the class period ends receive no credit.

**Dropping classes.** According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping
the class should be aware of the 3-peat rule and the 6-drop rule so they can recognize how dropped classes may affect their academic success.

- **6-drop rule:** Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit.

- **3-peat rule:** additional fees are charged to students who take the same class for the third time.

**Scholastic integrity.** As members of a community dedicated to honesty, integrity, and mutual respect in all interactions and relationships, students, faculty, and administration of our university pledge to abide by the principles in the Vaquero Honor Code. For more information, see the Student Conduct and Discipline Code.

**Course evaluation.** Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:

- Feb 15 – Feb 21 for Module 1 courses
- Apr 12 – Apr 18 for Module 2 courses
- Apr 12 – May 3 for full spring semester courses

**Sexual harassment, discrimination, and violence.** In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a students time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

**Students with disabilities.** If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.
Student Learning and ABET Outcomes

Student learning outcomes. Upon successful completion of this course, students will be able to:

1. Apply formal methods of symbolic propositional and predicate logic.
2. Describe how formal tools of symbolic logic are used to model algorithms and real life situations.
3. Know how to use formal logic proofs and logical reasoning to solve problems.
4. Understand various proof techniques and determine which type of proof is best for a given problem.
5. Understand basics of number theory and matrices and their application to algorithms.
6. Relate the ideas of mathematical induction to recursion.
7. Understand the basic terminology of and perform basic operations associated with functions, relations, and sets.
8. Relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
9. Understand basic counting principles, such as the pigeonhole principle, and their applications.
10. Compute permutations and combinations of a set and interpret the meaning in application problems.
11. Calculate probabilities of events and expectations of random variables, and be able to differentiate between dependent and independent events.
12. Differentiate between types of structures used in models of computations and their applications.

ABET Outcomes

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
3. 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.