I. **Course:** MATH 331, Discrete Mathematics, 3 credit hours

II. **Course Description:** Mathematical models, mathematical reasoning, sets, binary relations, counting and algorithm analysis, infinite sets. Prerequisites: CSCI 151 and Math 192.

III. **Text:** DISCRETE MATHEMATICS, 5th Edition, by Kenneth A. Ross and Charles R. B. Wright. Tentatively, chapters 1, 2, 3, and 4 of the text will be covered. If time permits, parts of 5 and 10 will also be covered.

IV. **Technology:** TI-83/84 is highly recommended.

V. **Student Learning Outcomes:** A student who passes this course will demonstrate through solving problem the ability to apply mathematical reasoning to physical problems and theoretical situations. The student will have demonstrated problem solving ability that includes but is not limited to proving theorems, working with relations, and identifying relationships between set operations, logic operators, and Boolean algebra. The student will be eligible to enroll in a variety of upper level mathematics courses (catalog specified).

VI. **Methods of Evaluation:**

Evaluation methods can include grading homework, chapter or major tests, quizzes, and computer assignments.

Attendance: It is essential. You are responsible for all announcements and materials presented in the class.

Homework: Homework assignments are listed in the end of this file. They will be collected weekly on each Tuesday. Selected questions will be graded. Each collected homework is worth 5 points.

Glossary: This course has numerous terms. Understanding them is essential for this course. A temperate of glossary will be given. You will need to complete and turn it in. The paper you submit must be your own work. Plagiarism is prohibited. Do not share your paper with your classmates, and do not ask your classmates for a file of glossaries. The file of glossary must be prepared by Microsoft Word. Glossary is worth of 80 points.
Tests: There will be 3 exams. Each exam is worth 80 points. A make-up exam (except the last one) will be given only under a very special circumstance and if I am notified before the exam. The make-up exam may be more difficult than the classroom exam and must be made up within one week.

Final Test: The Final exam will be comprehensive and is worth of 120 points. It is scheduled at 8:00am-10:00am, Thursday, December 17, 2015.

Extra Credit: The Mathematics Department offers colloquia and math club activities. You will receive 3 points of extra credit for each colloquium and a math club activity you attend up to 15 points. You need to watch flyers posted in the hallways. There is no make-up for extra credit.

Grades: The maximum possible points available in this course are:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>70</td>
</tr>
<tr>
<td>Glossary</td>
<td>80</td>
</tr>
<tr>
<td>Tests</td>
<td>240</td>
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<tr>
<td>Final</td>
<td>120</td>
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<tr>
<td>Total</td>
<td>520</td>
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Your course grade will be based on the percentage of the points you make to the total points available in the course:

A>=90%,  B>=80%,  C>=70%  D>=60%  F<60%.

VII. Other Information

- Early Intervention for First Year Students: Early intervention for freshmen is designed to communicate the University’s interest in their success and a willingness to participate fully to help students accomplish their academic objectives. The university through faculty advisors and mentors will assist students who may be experiencing difficulty to focus on improvement and course completion. This process will allow students to be knowledgeable about their academic progress early in the semester and will provide faculty and staff with useful data for assisting students and enhancing retention. Grade reports will be mailed by the end of the sixth week of the semester.

- The information for students with disability: 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 have a disability requiring an accommodation, please contact: Office of Student Disability Resources and Services, Texas A&M University-Commerce, Gee Library, Room 132, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148, email: StudentDisabilityServices@tamuc.edu

- Basic Tenets of Common Decency: “All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.” (Student’s Guide Handbook, Policies and Procedures, Conduct.) This means that rude and/or disruptive behavior will not be tolerated.

- Free tutoring service is provided by the Math Skill Center (Binnion Hall Room 328) with the following hours: M and W, 8am–8pm; T and R, 8am–6pm; and F 8am–12pm.
### Math 331 Homework

**Section 1.1, Page 6-7:** 2, 3, 4, 7, 11, 20(a)

**Section 1.2, Page 14-15:** 2, 5, 10, 11, 16, 21

**Section 1.3, Page 21-22:** 1, 3, 7, 8(a, c, g, h), 13

**Section 1.4, Page 27-28:** 1, 3, 7, 9(a), 10(a), 11

Use a Van diagram to show \((A \cap B)^C\), \((A \oplus B)^C\) and \((A \setminus B) \cap C\).

**Section 1.5, Page 33-34:** 2, 3, 5, 6, 10(a), 11(a)

**Section 1.6, Page 38-39:** 2, 4, 7, 9,

Let \(A_n = \left[ \frac{1}{n}, 1 \right]\), find \(\bigcup_{n=1}^{\infty} A_n\) and \(\bigcap_{n=1}^{\infty} A_n\).

**Section 1.7, Page 44-45:** 1, 4, 7, 11

Let \(f(x) = x^3 - 4\).

(a) Prove \(f(x)\) is one-to-one.

(b) \(a = [-1, 4]\), find \(f(A)\).

(c) \(B = [-3, 5]\), find \(f^{-1}(B)\)

(d) Find \(f^{-1}(-4)\).

**Section 2.1, Page 56-57:** 1, 2(a, b, c), 6, 12, 17, 18

**Section 2.2, Page 65:** 1, 2, 4(a-d), 5, 7, 11, 24

**Section 2.3, Page 67:** 1(b)

**Page 70-71:** 6, 11, 13, 14

**Section 2.4, Page 76:** 1, 2, 3, 5, 13 (hint: #5, #13, proof by cases)

**Test 1 covers Chapters 1 and 2**

**Section 3.1, Page 99-100:** 1(b, d), 2(a, c, f), 7, 13

**Section 3.2, Page 105-106:** 1, 2, 10, 11, 12, 16

**Section 3.3, Page 111-112:** 3, 5, 7, 12, 15, 17

**Section 3.4, Page 118-119:** 1(a, b, c, d), 2(a, b), 3, 4, 7, 8

**Section 3.5, Page 125:** 2(d, e, f), 3, 4, 5, 6, 8, 9, 10, 11

**Test 2 covers Chapter 3**

**Section 4.2, Page 142-143:** 4, 5, 7(a, b, d), 8, 11, 14

**Section 4.3, Page 151-152:** 2, 3, 4, 6, 7, 9, 13

**Section 4.4, Page 158-159:** 2, 5, 10, 11

**Section 4.5, Page 166-167:** 1, 2, 7, 10, 11(a, b, c, d, e)

**Section 5.1, Page 188:** 1, 3, 5, 6, 7, 8, 10, 11

**Section 5.2, Page 195-196:** TBA

**Test 3 covers Chapters 4 and the rest**

**The Final covers all we learn in this semester.**