CSC215-01 DISCRETE STRUCTURES
COURSE OUTLINE (Fall 2009)

CLASSROOM: ST 105
CLASS TIME: MWF 2:00 – 2:50 pm
INSTRUCTOR: Dr. Maria Lam
OFFICE: ST 120
TELEPHONE: x5344 (or department x5552)
E-MAIL: maria.lam@hamptonu.edu
OFFICE HOURS: Tentative
MWF 1:00 pm – 2:00 pm
3:00 pm – 4:00 pm
TR 9:15 am – 11:15 am
Other times - by appointment only

COURSE DESCRIPTION: Lec. 3/ Credit 3

Introduction to set theory, logic and combinatorics. Relations and functions. Proof techniques, including mathematical induction. Introduction to graph theory. Prerequisite: CSC152, MAT117 or above.

COURSE OBJECTIVES:

This is a discrete mathematics class at the introductory level. At the conclusion of the course, the student will be expected to:
1. Solve problems using elementary set theory and logic.
2. Differentiate various proof techniques that can be used on implications.
3. Discuss and apply Mathematical Induction.
4. Solve counting problems.
5. Distinguish relations and functions.
6. Solve problems using graph theory.
7. Describe formal algorithmic notation.
8. Be aware of cryptology techniques.

ESSENTIAL COMPETENCIES:
1. Student will recognize the importance of computer ethics for a computer professional.
2. Student will differentiate various proof techniques to prove implications
3. Student will apply Mathematical Induction to prove certain results.
4. Student will be able to distinguish functions and relations and their properties.
5. Student will be able to examine simple graphs for certain characteristics.
6. Student will be able to analyze the situation and apply correct principles to do counting.
7. Student will be able to describe formal algorithmic notations.
8. Student will be able to differentiate various cryptology techniques.

**PREREQUISITE:**

MAT117 or above with a ‘C’ or better and
CSC152 with a ‘C’ or better

**REQUIRED TEXT:**

by Richard Johnsonbaugh
Prentice Hall

**REFERENCES:**

1. Discrete Mathematics with Applications, Third Edition
   by Susanna Epp
   Thomson
   (more advanced)
2. Discrete Mathematics books at the introductory level
   The Harvey Library has a collection of them.
3. Invitation to Cryptology
   by Thomas H. Barr
   Prentice Hall

**COURSE OUTLINE:**

1. Computer Ethic and Social Responsibility, University Honor Code  (0.5 wk)
2. Logic and Proofs  (3.5 wks, Sections1.1-1.5, 1.7)
   - Propositions
   - Conditional Propositions
   - Logical Equivalence
   - Predicates
   - Quantifiers
   - Proof Techniques
Mathematical Induction

3. The Language of Mathematics     (3.5 wks, Chapters 2, 3)
   Sets
   Sequences
   Relations
   Equivalence Relations
   Relational Databases
   Functions

4. Algorithms     (0.5 wk, Section 4.3)
   Formal Algorithmic Notation

5. Counting Methods     (2 wks, Sections 6.1-6.2, 6.7, 6.8)
   First Counting Principle
   Second Counting Principle
   Permutations
   Combinations
   The Binomial Theorem
   The Pigeonhole Principle

6. Graphs     (2 wks, Sections 8.1-8.3)
   Basic Terminology
   Paths and Cycles
   Eulerian, Hamiltonian Paths, Cycles

7. Cryptology     (1 wk)
   Terminology and Background
   Substitution Ciphers
   Transpositions
   Making ‘Good’ Encryption Algorithms
   The Data Encryption Standard (DES)
   The AES Encryption Algorithm
   Public Key Encryption
   The Uses of Encryption and Key Management

This is a lecture-based class.
We may not necessary cover the materials in this order.
The time allotment to each topic is only an estimate.

COURSE ASSIGNMENTS AND CALENDAR:

Throughout the semester, several sets of homework, pop quizzes, four tests, and a final examination will be given. The final exam and tentative test schedules are:

Test #1:  9/28/09
Test #2:  10/19/09
Test #3:  11/9/09
Test #4:  12/2/09
Final Exam:  12/18/09  8:00 – 9:50 am (ST 105)
The content of a pop quiz is based on the material covered during the last two classes.

**ATTENDANCE POLICY:**

The university attendance policy applies.

**ATTENDANCE REQUIREMENTS**

Faculty members have the right to establish attendance requirements in each of their courses. Instructors are responsible for clearly informing the students of the course syllabus at the beginning of the semester, of the attendance requirements, and the consequences of poor attendance.

**Regulations Governing Class Absences**

1. **Students who are absent from classes, regardless of the reasons, are responsible for completing all class assignments.** The student shall be responsible for arranging make-up work with the instructor, who shall be the sole judge of the satisfactory completion of the course.

2. Students will **not** be allowed to make up or complete work which is missed as a result of suspension or dismissal from the university. **Suspension or dismissal before the end of the semester involves the loss of academic credit for the entire semester.**

3. If a student is ill, confined to quarters or in a hospital, a statement from the Director of Student Health Services shall be cause to support the student's explanation of absence. Any student missing a class because of clinic or Student Health Center treatment will receive a form showing the period of absence. This form shall be presented to each instructor whose classes have been missed. Any student who is ill should notify his/her instructors that he/she will not be attending classes because of illness.

4. It is the responsibility of a student planning a prearranged absence for personal or school purposes to notify his/her instructors at least 24 hours prior to the absence. Absences for school purposes may be verified by the staff or faculty member responsible for the activity.

5. A student having to be absent because of a death or serious illness in the family should report the situation to the appropriate Office of the Dean of Women or Dean of Men. The Dean will notify the student's instructors that supportive documentation has been received for the necessary absence. Residential students should inform their Residence Hall Director of the circumstances prior to leaving the campus.

**In addition, students are expected to attend all classes. Students shall be responsible for class, work, and assignments missed during their (excused or unexcused) absence. If you miss a class, you should find out what you have missed from your fellow classmates, not from the instructor.**
GRADING POLICY:

The weights of homework, tests, pop quizzes, and final examination are:

- Homework: 15%
- Pop quizzes: 5%
- 4 Tests (1 dropped): 60%
- Final Examination: 20%

An appropriate letter grade will be assigned according to the scale:

<table>
<thead>
<tr>
<th>Overall Average</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>0 – 59</td>
<td>F</td>
</tr>
<tr>
<td>60 – 63</td>
<td>D-</td>
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<tr>
<td>64 – 67</td>
<td>D</td>
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<td>68 – 69</td>
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<td>70 – 73</td>
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<td>74 – 77</td>
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<td>90 – 93</td>
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<td>94 – 97</td>
<td>A</td>
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<tr>
<td>98 – 100</td>
<td>A+</td>
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THE FOLLOWING INFORMATION APPLIES TO ALL STUDENTS IN THE SCHOOL OF SCIENCE:

In addition to the minimum grade requirements established by Hampton University, all majors within the School of Science must pass all required courses offered within the school of science with a grade of “C” or better in order to satisfy degree requirements. The minimum grade requirement is in effect for all science courses taken during Fall 2001 and beyond (Refer to 2004-06 Academic Catalog, pg. 132 and/or 2006-08 Academic Catalog, pg. 109).

For Seniors only, Fall semester grades received during the 2001-02 academic year are exempt. Grades received during the second semester 2001-02 and beyond are governed by the new policy. Seniors who plan to complete academic requirements for graduation, May 2010 must resolve any academic deficiencies regarding this policy during the Spring 2010 semester.

MAKE-UP/LATE WORK POLICY:

Students will be allowed to make up a test and/or the final examination missed only when the absence is a result of:
1) Illness (must be verified by the Student Health Service). Note from Student Health Service is not acceptable unless it indicates that illness has been verified. If a student has a note from his/her doctor’s office or other health facility, it should be shown to the Student Health Service first so that an excuse will be issued by the Student Health Service.

2) Participation in an institution-sponsored activity that is required by his/her class work or major area of study (must be verified by a faculty sponsor’s statement and approved by this instructor in advance).

3) Recognizable emergencies approved by Dean of Men, Dean of Women, Dean of Students, or Executive Vice President / Provost (must have official letter indicating that the student should be allowed to make up test or final examination missed).

The official document (excuse) must be turned in to the instructor within one week after the test/final date, or the second day returning to campus (not at the end of the semester). In the case of the final examination, the instructor must be notified and the document must be turned in within 24 hours or a zero will be assigned as the final exam score.

A cumulative make-up test (only one) will be given at the end of the semester (usually during the last week of class) for those who have turned in acceptable excuses on time earlier. If a student misses more than one test (with acceptable excuses), this make-up test score will be counted as many times as needed. A score of zero will be assigned automatically to any unexcused, missed test.

Unless a student have been absent during the entire period: from the day a homework is assigned, to the day when it is due (which usually covers at least 8 days), he/she must turn in the homework no later than 5:00 pm on due day, or receives a zero for this homework. In the situation mentioned above, the homework will be omitted, resulting in one less homework assignment to be counted towards the average of the homework. If a student is going out of town, turn in the homework before leaving. If you email in your homework while out of town, make sure that it arrives on or before the deadline. The instructor is not responsible for missing emails. A zero will be the grade for this missing homework. If your friend turns in your homework late for you, you are still responsible and the zero grade policy will apply.

There will be no makeup pop quiz. A missed pop quiz with acceptable excuse will be dropped from the calculation. Otherwise, zero will be the grade for the quiz.

The official University attendance requirements, and academic dishonesty policy can be found on p. 32 and p. 28 respectively of the 2000-2001 version of the Hampton University Student Handbook.

**POLICY ON ACADEMIC DISHONESTY:**

The following is taken from The Official Student Handbook 2004, p. 29
CHEATING

A student caught cheating on an examination or plagiarizing a paper which forms a part of a course grade shall be given an "F" in the course and will be subject to dismissal from the University. A student is considered to be cheating if, in the opinion of the person administering an examination (written or oral), the student gives, seeks, or receives aid during the process of the examination; the student buys, sells, steals, or otherwise possesses or transmits an examination without authorization; or, the student substitutes for another or permits substitution for himself/herself during an examination. All cases of cheating shall be reported by the instructor to the chair of the department in which the cheating occurred, to the school dean/division director and to the Provost. No penalty shall be imposed until the student has been informed of the charge and of the evidence upon which it is based and has been given an opportunity to present his/her defense. If the faculty member and the student cannot agree on the facts pertaining to the charge, or if the student wishes to appeal a penalty, the issue may be taken to the department chair. Each party will present his/her case to the chair who shall then call a meeting of all involved parties. If the issue is not resolved at the departmental level, the dean shall conduct a hearing. If the issue is not resolved at the school level either party may appeal the decision at the school level to the Provost who shall convene the appropriate individuals and conduct a hearing in order to resolve the issue.

PLAGIARISM

Plagiarism is defined as "taking and using as one's own the writing or ideas of another." All materials used to meet assigned written requirements of a course, from any source, must be given proper credit by citing the source. A student caught plagiarizing a paper which forms a part of a course grade shall be given an "F" in the course and will be subject to dismissal from the University.

PENALTIES FOR ACADEMIC DISHONESTY

Cases of academic dishonesty are initially investigated and reported by members of the instructional faculty to the chairperson of the department in which the cheating occurred, to the school dean, division director and to the Provost. Also, penalties for minor violations of academic dishonesty are to be recommended at the discretion of the instructor. The penalties for academic dishonesty on examinations and major course requirements may include one of the following:

1. A grade of "F" on the examination or project.
2. A grade of "F" on the examination or project and dismissal from the course.
3. A grade of "F" on the examination or project, dismissal from the course and from the University.

When dismissal from the University is the recommended penalty, the chairman of the department submits the details of the case to the Provost who schedules a hearing.

ADMINISTRATIVE ACTION

The Provost has the authority to dismiss or expel any student who fails to meet scholarship requirements or to abide by academic regulations.

DRESS CODE

Examples of inappropriate dress and/or appearance include but are not limited to:

1. Do-rads, stocking caps, skullcaps and bandannas are prohibited at all times on the campus of Hampton University (except in the privacy of the student's living quarters).
2. Head coverings and hoods for men in any building.
3. Baseball caps and hoods for women in any building.

This policy item does not apply to headgear considered as a part of religious or
cultural dress.
4. Midriffs or halters, mesh, netted shirts, tube tops or cutoff tee shirts in classroom,
cafeteria, Student Union and offices.
5. Bare feet.
6. Short shorts.
7. Shorts, all types of jeans at programs dictating professional or formal attire, such as
Musical Arts, Fall Convocation, Founder’s Day, and Commencement.
8. Clothing with derogatory, offensive and/or lewd messages either in words or pictures.
9. Men’s undershirts of any color worn outside of the private living quarters of the
residence halls. However, sports jerseys may be worn over a conventional tee-shirt.


MISCELLANEOUS:

1) Students cannot leave the classroom during a test or final examination. Always
sharpen your pencils, bring enough Kleenex with you before the test. If you leave the
classroom during a test or final examination for any reason, you will not be able to
return and continue.

2) If you have any questions about the grade you received for your work, you should
make the inquiry within one week after the work has been returned. Late inquiry will
not be considered.

3) Please note that a student will not receive an “I” grade automatically when he/she
misses some work and/or the final exam (even with an acceptable excuse). An “I” is
given to those who have a passing average until that “something” happened.
Therefore, skipping the final exam may not earn you an “I”. Please see Students’
Handbook for detail.

4) Talking, laughing, eating, and walking around the classroom during class time is
unacceptable. It disrupts the class. You will be asked to leave the classroom if you do
not stop doing it. The University Security will be called if you refuse to leave.

5) Gentlemen, please remove your hat, cap, etc. before entering the classroom unless you
have a religious and/or medical reason to keep it on.

6) One cannot operate (calling or receiving) a cell phone in the classroom. Turn it off and
put it in your book bag. This includes using the calculator of the cell phone (if there is
one). If you need to use a calculator, bring an additional one and use it instead.

WRITING ACROSS-THE-CURRICULUM
You are required to do a short (between 2.5 to 3 pages) double-spaced computer ethics paper. You are to choose your own topic or issue within the scope of computer ethics. The last day to turn in this paper is November 30, 2009, but you may turn in your paper any time before the deadline. 1 to 6 points will be awarded to this paper (based on the Hampton University Scoring Rubric which is attached). Multiply the score of your paper by 2/3 to calculate your bonus points which that be added to your overall average.

SECTION 504:

Students with disabilities which require accommodations should (1) register with the Office of Testing Services and 504 Compliance to provide documentation and (2) bring the necessary information indicating the need for accommodation and what type of accommodation is needed. This should be done during the first week of classes or as soon as the student receives the information. If the instructor is not notified in a timely manner, retroactive accommodations may not be provided.

STUDENT ATHLETES

All student athletes must inform the instructor of their participation in sports or institutional activities at the beginning of the semester.

RELATING TO MISSION STATEMENT

1. Development of Character
2. Scientific Emphasis
3. Research

ACTIVITIES

1. Students are required to take their tests, quizzes, and final examination on time; and to submit their homework assignments as scheduled. This helps them to develop into a well-disciplined individuals.
2. Many topics in this class serve as a foundation to computer science. They are the building blocks for several branches of computer science.
3. Many basic computer science research evolve around some of the concepts taught in this course - Discrete Structures. The computer ethic paper also requires a student to do a little bit of research on computer ethics.

DISCLAIMER
This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the professor reserves the right to modify, supplement and make changes as course needs arise.

There is an addendum containing:

- Hampton University Scoring Rubric
- Hampton University Code of Conduct
- Grievance Procedure