SYLLABUS   **Fall, 2015**

MAT214A Discrete Structures   **4.0 cr. [DII]**
Prerequisites: None

Instructor: Beifang Yi	**Office**: MH 211A	**Phone**: (978) 542-7246
email: byi@salemstate.edu	**Hours**: 12:50-3:00 (TR) 3:30-4:30 (W)	**WebSite**: http://cs.salemstate.edu/~byi/

Section	Time	Room	Final Exam
01	W & F 1:40pm—3:20pm	MH 301	**Friday 12/18, 11:00am-1:00pm** **MH 301**

Catalog description:

A study of discrete mathematical structures of interest in computer science and other applied fields. Topics will be chosen from logic, proof techniques, sets, Boolean algebra, functions, relations, basics of counting, recursion, graphs, trees, and discrete probability. Four lecture hours per week. Not open to students who have received credit for either MAT214 or MAT 314.

Prerequisites: None.

Global Goals:

This course is intended to:
- develop students' ability to think abstractly, use logically valid forms of argument, avoid common logical errors and understand what it means to reason from definitions.
- expose students to a variety of discrete structures that appear frequently throughout mathematics.
- provide students with a familiarity with the fundamental notions of set, function, logical consequence and proof.
- gain experience using counting techniques appropriate to discrete structures.
- obtain an ability to identify discrete structures in everyday life.
- become able to apply the concepts and techniques studied to practical problems

Learning Objectives:

Upon successful completion of the course, a student will be able to do the following:
- identify the logical structure of statements.
- determine the truth value of compound mathematical statements given the truth values of the components by using a truth table.
- determine the logical relation (implication, equivalence, contrapositive, negation, etc.) between two mathematical statements.
- write valid mathematical proofs, using a variety of proof techniques including mathematical induction.
- use permutations, combinations and the multiplication principle of counting to formulate and solve counting problems.
- define sequences recursively and solve simple recurrence relations.
- express relations and functions as sets.
- use the abstract notion of function to describe relationships.
- identify relations as functions, one-to-one functions and onto functions.
- Be able to use the order notation to discuss the efficiency of algorithms.
- use standard Boolean operations to describe sets.
- solve basic problems on graphs and networks.
- be able to find the minimal spanning tree of a weighted graph.
- be able to find Euler and Hamiltonian paths and circuits for some graphs

Course Topics

A detailed topics list can be found from course schedule copy given in the class and on the instructor's homepage (http://cs.salemstate.edu/~byi/ and through the link to this class, i.e., MAT214A).

Text:

(Required) Discrete Mathematics with Applications, 4th Edition, by Susanna S. Epp. Cengage Learning, 2011 (ISBN: 978-0-495-39132-6).

Additional references:

- Course website: http://cs.salemstate.edu/~byi/MAT214A/.

Cell phones:

Turn the ringer off, or, better yet, *turn the phone off*.

Lecture Attendance:

Class policy is that of the Registrar's office - see the University catalog for details. Lecture will start promptly at the scheduled time, so please make a serious effort to not be late. While class attendance does not *directly* affect your final grade, some of the material covered in class may be not found (in the same form) in the text or will be presented in different formats (than from the textbook) so class attendance and notes are very important. Note that you are at all times responsible for materials and assignments discussed in class: if you miss a class, try to get lecture notes from a classmate and review them *before* the next lecture. We will use SSU's online course management system, **Canvas** (https://elearning.salemstate.edu) to post assignments, quiz grades, and announcements regarding the course topics and progress. You will need to visit Canvas (with your SSU Navigator use-name and password) for the course activities. Canvas uses your SSU-stored email box for the communication between you and the instructor and thus you must use that email address. Each student is responsible for completing all course requirements and for keeping up with all that goes on in the course (whether or not the student is present).

Whether you come to class on time or not, **reading of the topics before** their presentation in the class is very important to your success in this course!

Final Grade:

Final grade will be determined using the following grading weights:

	Grade-A	Grade-B	Grade-C
assignments	10%	0%	0%
quizzes	40%	50%	0%
midterm examination	15%	15%	30%
final examination	35%	35%	70%
semester overall final grade	Max (*Grade-A*, *Grade-B*, *Grade-C*)		

Attendance is not used to calculate the final grade: however, note that you are at all times responsible for assignments and materials presented in class. Please note that **Grade-A** from the above table gives the **easiest** way of earning higher grade.

Assignments/Quizzes:

Homework will be assigned for each section/topic we cover. The problems pertaining to a section/topic completed during a given class will be due very soon (usually in the next class meeting).. You can work on the problems freely with others from class, unless it is for an assignment to be turned in and you are instructed to work alone. For the most part, *homework will be evaluated through quizzes*.

Your grades of these assignments (not the quizzes) will be mostly based on how much you have completed the homework rather than the correctness of your solutions. The quiz questions will be mostly like the assignment questions and thus your quiz grades will give a very accurate evaluation of your understanding of the course topics and performance on both the quizzes and assignments. Please check the grading table above on how to calculate your overall final grade and also refer the penalty policy for late submissions below (i.e., Due Dates/Time).

Exams/Quizzes:

There will be one midterm and one *comprehensive* final examination and several quizzes. The midterm will be held in week 8 depending on class progress. Check the table under Final Grade above for these test grading weights and times.

Quizzes will be held in class hours. There will be about 10 quizzes to be held in the semester (one quiz with the lowest grade will not be used to calculate the final grading/scoring).

Missed Tests:

Tests (the final exam and quizzes) may not be made up except for *documented emergency* situations. If a test must be made up, arrangements must be made with the instructor to take the test before it is discussed in class (usually within a week of the test being administered).

Due Dates/Time:
- You will **lose 60%** of your assignment credits if you turn in your assignment after the deadline and there will be **10% (more) penalty for each week** for your late submission (exceptions may be applied on rare situations such as family emergencies, medical treatments, …).
- **No** assignments will be accepted/graded **after the final examination**.

Study Groups:

While I strongly encourage study groups, I require that each student hand in his/her answers in her/his own words - if two answers are highly similar to each other, neither will receive credit.

When working on your programming projects, you may discuss with others the project topics, the algorithms and methodologies related to the project; but when you work on writing the code, this coding work should be 100% of your own work. **If two answers/written code segments come out exactly the same or highly similar, neither will receive credit and/or further actions will be taken** (such as reporting to the department and/or university). Given the nature of most of the projects, homework questions and writing assignments, it will be almost impossible for two people to come up with highly similar answers UNLESS they copy.

Academic Integrity:

Academic Integrity Policy and Regulations can be found in the University Catalog and on the University's website (http://catalog.salemstate.edu/content.php?catoid=13&navoid=1295#Academic_Integrity). The formal regulations are extensive and detailed - familiarize yourself with them if you have not previously done so. A concise summary of and direct quote from the regulations: "Materials (written or otherwise) submitted to fulfill academic requirements must represent a student's own efforts". *Submission of other's work as one's own without proper attribution is in direct violation of the University's Policy* and will be dealt with according to the University's formal Procedures.

"Salem State University is committed to providing equal access to the educational experience for all students in compliance with Section 504 of The Rehabilitation Act and The Americans with Disabilities Act and to providing all reasonable academic accommodations, aids and adjustments. <u>Any student who has a documented disability requiring an accommodation, aid or adjustment should speak with the instructor immediately.</u> Students with Disabilities who have not previously done so should provide documentation to and schedule an appointment with the Office for Students with Disabilities and obtain appropriate services."

In the event of a University declared critical emergency, Salem State University reserves the right to alter this course plan. Students should refer to http://www.salemstate.edu for further information and updates. The course attendance policy stays in effect until there is a university declared critical emergency. In the event of an emergency, please refer to the alternative educational plans for this course via the course link at Canvas (https://elearning.salemstate.edu/).

Please remember that if, for any reason, you decide to drop this course, you **MUST** do so officially through the Registrar's office. The last day to withdraw from a course this semester is **November 20th**.

> **Note:** This syllabus represents the intended structure of the course for the semester. If changes are necessary, students will be notified in writing and via all regular class communication mechanisms (class discussion, emails, and/or the course link at Canvas https://elearning.salemstate.edu).