SYLLABUS   **Spring, 2012**

CSC 200A Survey of Computer Science I   **3 cr. [DII]**
Prerequisite(s): Fulfillment of the Basic Mathematics Competency Based Skills requirement and ability to use standard computer software (e.g., operating system features, word processing, email, and web browsers).

Instructor: Beifang Yi	Office: MH 208D	Phone: (978) 542-7426
email: byi@salemstate.edu	Hours: W 4:30-5:30pm	Web Site: http://cs.salemstate.edu/~byi/
	T & R 9:30-10:50am, 3:30-6:00pm, 9:20pm-10:00pm	

Section	Time	Room	Final Exam
S1	R 6:00pm-9:20pm	MH 206	**May 3, Thursday, 7:20pm—9:20pm, MH 206**

Catalog description:
    This course provides an overview of fundamental areas within the field of Computer Science, introducing basic vocabulary, central concepts, and typical applications. The areas surveyed include computer hardware, computer arithmetic, operating systems, programming constructs, programming languages, information storage and retrieval, databases, networking**,** and the social context of computing. Three lecture hours per week.   This course satisfies the Computer Literacy Competency-Based Skills requirement.

Goals:
    The aims of this course are to help the student to gain an appreciation for the breadth and variety within the computer science field and to be better prepared for the technical treatments presented in later courses. Specifically, the goals are:
    CG01:   to acquaint the student with many of the major subdivisions within academic computer science;
    CG02:   to provide a standard descriptive vocabulary for these topic areas;
    CG03:   to provide a survey of the most important concepts in each topic area.

Objectives:
    Upon successful completion of this course the student will have demonstrated the ability to:
    CO01:   use correct technical terminology to name and describe the principal hardware and software components of a computer system;
    CO02:   understand the conversion of text and numeric data between "human readable" form and binary form;
    CO03:   understand and explain the instruction cycle ("fetch/execute cycle") and its role in the operation of a computer system;
    CO04:   use correct terminology to describe the various measurements of capacity and speed relating to a computer system;
    CO05:   name and understand the principal classifications of files and software, and the differences and distinctions among them;
    CO06:   name and explain the four principal programming paradigms;
    CO07:   understand the basics of computer networks;
    CO08:   name the principal functional components of an operating system and describe the main responsibilities of each one;
    CO09:   give a general description of such topic areas as database systems and artificial intelligence;
    CO10:   give a general description of such topics as software piracy, liability, privacy concerns, and computer security, and current thinking and controversies in each area.

Course Topics:
    The department-standard list of topics and a general course bibliography can be found on the Computer Science Department website (at http://cs.salemstate.edu/dept/index.php?page=184). The topics include:

- introduction: **SP1(1)**
  - ° history of computing (survey)
  - ° What is a computer? (operational definition)
  - ° fundamental computer capabilities (read, write, store, compute, compare)
  - ° components of a typical computer
- the role of the computer **SP2(3)**
  - ° as a communications tool
  - ° as an information resource
  - ° as a problem-solving tool
  - ° as a real-time control mechanism
- computer hardware **AR1(2),AR2(4),AR3(1),AR4(1),AR7(0.5)**
  - ° logic gates and circuits
  - ° binary, octal, and hexadecimal numeration systems
  - ° machine representation of numbers
    - ▪ integers
    - ▪ 2's complement representation of negative numbers
    - ▪ floating point numbers
  - ° computer arithmetic
  - ° CPU structure
  - ° main memory structure
  - ° secondary storage devices (disk, tape)
  - ° I/O devices and their operation
  - ° multiprocessor systems
  - ° parallel processing
- communicating with a computer **OS8(1), IM12(0.5) (not core)**
  - ° files (text vs. binary, sequential vs. direct)
  - ° organization of text data (items, fields, records, files)
  - ° coding of text (ASCII, Unicode, etc.)
  - ° markup languages, hypertext
  - ° machine language **AR3(2)**
    - ▪ memory addresses
    - ▪ program counter, instruction register
    - ▪ the instruction cycle
    - ▪ instruction set, operation codes
  - ° symbolic languages **PL1(2.5), PL3(2)**
    - ▪ assembly languages
    - ▪ high-level programming languages
      - ➜ language specification: syntax diagrams, EBNF
      - ➜ language translation: assemblers, compilers, interpreters
      - ➜ lexical analysis, parsing, code generation
    - ▪ programming paradigms
      - ➜ procedural, declarative, functional, object-oriented
    - ▪ programming languages, past and present
- problem-solving, program design and programming
  - ° data types, variables, constants **PL4 (0.5)**
  - ° control structures **PF1(2)**
  - ° modules
  - ° problem analysis
  - ° requirements and specifications **SE5(0.5)**
  - ° solution design **SE1(1)**
  - ° algorithms **PF2(2)**
  - ° software testing and evolution **SE6(0.5), SE7(0.5)**
  - ° the human dimension of software: clarity & convenience of use **HC1(0.5)**
- information storage and retrieval
  - ° goals

- ° conceptual vs. physical organization of data **IM1(0.5)**
- ° data structures **PF3(1)**
- ° databases, database systems, and database management **IM2(0.5)**
- ° database query languages IM5(1) (not core)
- operating systems
  - ° the purposes of an operating system
  - ° resource allocation **OS1(2)**
  - ° system tools: editors, linkers, loaders, other utilities
  - ° scheduling **OS4(0.5)**
  - ° virtual memory **OS5(0.5)**
- artificial intelligence **IS1(1)**
  - ° goals and issues
  - ° expert systems
- the social context of computing
  - ° appropriate vs. inappropriate **SP5(0.5)**
  - ° codes of ethics for computer users and professionals **SP4(1)**
  - ° intellectual property standards **SP6(1.5)**
  - ° privacy, civil liberties **SP7(2.0)**

Text(s): (required) Computer Science Illuminated, 4th edition. Nell Dale & John Lewis. Jones and Bartlett, 2011. (ISBN 978-0-7637-76466)

Additional references:
- Textbook 3rd version online resources (free): http://csilluminated.jbpub.com
- Textbook 4th version online resources: http://computerscience.jbpub.com/csilluminated/4e/
- Course website: http://cs.salemstate.edu/~byi/2012Spring/CSC200A/index.html
- *The Architecture of Computer Hardware and Systems Software: An Information Technology Approach*, 3rd Edition, by Irv Englander (2003), Wiley.

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

Class Attendance:
   Class policy is that of the Registrar's office. Aside from college regulations, much of the material covered in class is not found (in the same form) in the text, so class attendance and notes are very important. Note that you are at all times responsible for materials, handouts 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, and **check your email and visit the course website (through the instructor's homepage) for any notes and/or announcements about the course progress**.
   No excuses of any nature will be construed as relieving you from the responsibility for completion of the work assigned. 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).

Final Grade:
   Final grade will be determined using the following grading weights:

Assignments	65%
Final examination	35%

   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. final examination will be a comprehensive exam that cover all the coursework (all the assignments.

The following table shows how the course work is assessed against the course objectives:

	Homework Assignments	Final Examination
CO01	✔	✔
CO02	✔	✔
CO03	✔	✔
CO04	✔	✔
CO05	✔	✔
CO06	✔	✔
CO07	✔	✔
CO08	✔	✔
CO09	✔	✔
CO10	✔	✔

Submission Deadlines / Late Submission Penalties:

There are specific due dates/times for any assignments and these assignments should be completed by the deadlines. **The penalty for late assignment submission will be 15% off for each week elapsed since the due date; no submissions will be accepted after May 7, 2012.** The assignments will be announced / given in class and/or through course website.

Exams/Quizzes:

There will be a *comprehensive* final examination that will cover all the course work (assignments). The final exam will be on May 3, Thursday, 7:20pm—9:20pm, MH 206. **Note:** Make-ups are given for the missed examination only under exceptional and documented circumstances.

Missed Tests:

Missed tests will be made up *only under extreme conditions/emergency with the proper documentation*. Students who know in advance that they must be absent on an exam day for an excusable reason should notify the instructor prior to the exam day. Students who are absent on the day of the exam for an excusable reason should contact the instructor immediately following their absence. Makeup work will be permitted *only when* the instructor is presented with acceptable documentation for acceptable absences. It is your responsibility to notify your instructor of any excused absence as far in advance as possible.

Homework Assignments:

There will be a series of assignments from the textbooks and other sources. Reading assignments will be a part of the assignments. All assignments are due *at the beginning* of class on the dates to be set by the instructor. Penalties will be applied to any late assignment submissions (check the above explanation).

Usually, you must complete (correctly) 900-points questions (out of 1000-points questions) to get 100% on the assignment average grade. Please note that these assignments constitute 65% of the final grade.

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 exactly same or highly similar to each other in some types of questions, neither will receive credit.

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 located at http://cs.salemstate.edu/~byi/2012Spring/CSC200A/emergency/index.html. Students should review the plans and gather all required materials when an emergency is declared.

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 homepage through the instructor's website at http://cs.salemstate.edu/~byi/).