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SYLLABUS   **Fall 2008**

CSC 215 Survey of Computer Science II   **4 credits**
Prerequisite(s): CSC 201J, and a grade of C+ or better in either CSC 200 or CSC 200A.

Instructor: Beifang Yi	Office: MH 208D	Phone: (978) 542-7426
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Section	Time	Room	Final Exam
01	TR 3:00 – 4:45	MH 206	Dec 17th, Wednesday 11:00am—1:00pm

Catalog description:
   This course builds on CSC200/200A and provides an overview of selected Computer Science topics that are more technical or more advanced than those discussed in the earlier course. Topics include a detailed discussion of the binary, octal, and hexadecimal numeration systems, the machine representation of data and instructions, the design of a typical computer chip, programming in a simplified machine language, and such application areas as robots and embedded systems (programming and construction), artificial intelligence, computability theory and Turing machines, and an introduction to networks, including the Internet model. Four lecture hours per week plus laboratory work outside of class.

Course 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:
- CG1: to build an in-depth understanding for machine representation of data and instructions;
- CG2: to build detailed understanding of several major application areas of computer science;
- CG3: to provide a capability to solve problems in each topic area.

Course Objectives:
   Upon successful completion of this course the student will have demonstrated the ability to:
- CO1: carry out the conversion of text and numeric data between a human readable form and binary form such as ASCII characters, decimal negative numbers to 2's complement binary numerals, and exponential numbers to binary floating point;
- CO2: write simple machine language programs for a simple fictional computer chip and memory;
- CO3: construct simple sequential logic circuits;
- CO4: solve problems from selected areas in artificial intelligence;
- CO5: solve problems from selected areas of computational theory;
- CO6: solve problems involving imbedded computer systems;
- CO7: solve problems involving networks of all sizes including the Internet;
- CO8: solve problems in distributed algorithms, graphics, and human/computer interface design.

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/csc215.htm. The topics include:
- introduction:
    - overview of the operational definition of computer
    - overview of fundamental computer capabilities (read, write, store, compute, compare)
    - overview of components of a typical computer

- detailed discussion of computer hardware
  - logic gates and circuits and construction of sequential circuits
  - binary, octal, and hexadecimal numeration systems and conversions
  - machine representation of numbers and conversions to and from decimal
  - integers and 2's complement
  - floating point numbers (including the IEEE 754 standard)
  - text (ASCII, Unicode)
  - computer arithmetic and detailed logic of circuitry
  - CPU structure and detailed logical operation
  - main memory structure and details of construction and operation
  - secondary storage devices (disk, tape); details of magnetic and optical media
- computer software
  - programming in machine language
    - memory addresses
    - program counter, instruction register
    - the instruction cycle
    - instruction set, op codes, operands
- artificial intelligence
  - logical induction
  - logical deduction
  - formal logic
  - probabilistic reasoning
  - machine learning
  - expert systems
  - neural networks
  - Turing test
- computation theory
  - finite automata, Turing machines, the Church-Turing thesis
  - computability, the P and NP classes
  - big-O algorithm analysis
- embedded systems
  - maze construction
  - maze navigation
  - intelligent agents
- networks
  - network security
  - bus networks
  - ring networks
  - the client/server model
  - Internet networks
  - Internet model
- distributed algorithms
- graphics
- human/computer interfaces

In addition to the above topics, we may also briefly introduce the following topics:

- human-computer interaction
  - foundations of human-computer interaction
  - graphical user interface design
- graphics and visual computing
  - graphic systems
  - computer animation
  - visualization

Text(s): (required) **Computer Science: An Overview**, 10th Edition, by J. Glenn Brookshear. Addison-Wesley.,2008. (ISBN: 0-321-52403-9)

Additional references:
- *Concepts in Computing*, by Kenneth Hoganson. Jones and Bartlett Publishers. 2008
- *Invitation to Computer Science* (4th edition, 2007), by Schneider and Gersting. Thomson Course Technology.
- *Computer Science Illuminated* (3rd edition, 2006), by Dale and Lewis. Jones and Bartlett Publishers.
- *The Essence of Artificial Intelligence*, by Alison Cawsey. Prentice Hall. 1998
- *Computer Systems*, by J. Stanley Warford. Jones and Bartlett Publishers. 2006.
- (Handouts will be given in class).

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

Class Attendance:
Class attendance is highly recommended. You are responsible for all materials presented in class, quizzes, examinations, and other announcements. 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).

Scheduled Lab Attendance:
There will be one or two lab classes to be held in the Lab. Lab attendance is mandatory for every student. The other laboratory work is done on the student's own time, outside of scheduled lectures. The lab class activities and lab homework are part of the homework assignments.

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

homework assignments	45%
writing and presentation assignments	10%
quizzes	15%
midterm examination	12%
final examination	18%

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.

Submission Deadlines/Late Penalties:
There are specific due dates/times for any assignments and these assignments should be completed by the deadlines. A penalty of 10% will be applied for late submission for each day (including weekends and holidays). All the assignments will be announced/given in class and through course website.

Exams/Quizzes:
There will be periodic quizzes (15% total), one midterm (12% total), and one final (comprehensive) exam (18% total). The lowest quiz grade will be dropped. The midterm will be held in week 8 depending on class progress. The final exam will be on December 17th, Wednesday, 11:00am—1:00pm. **Note:** Make-ups are given for missed quizzes or examinations 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.

Writing and Presentation Assignments:

There will be a writing assignment and one or two presentations. Students select a topic and write a short essay about it. Presentations will be based on the writing essay and other topics and be delivered in class. Specifications on these assignments will be given in class. Note: the writing and presentations assignments constitute 10% of the final grade. There are no make-ups for missed presentations unless under extreme circumstances with advanced notification of the instructor and certain supporting documentation. The writing essay may be submitted anytime after the midterm examination but must be turned in before the final examination (Dec 17th, Wednesday 11:00am).

Homework Assignments:

There will be a series of assignments from the textbooks and other sources. Reading assignments will be a part of the homework assignments. All assignments are due *at the beginning* of class on the dates to be set by the instructor. A 10% penalty will be imposed for each day (including weekends and holidays) an assignment submission is late.

One assignment with the lowest grade will be dropped from the final grading.

Please note that these assignments constitute 45% of the final grade and that in addition to these homework assignments there will be Writing and Presentations assignments which make up 10% 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 come out exactly the same, neither will receive credit. Given the nature of most of the homework and essay questions, it will be almost impossible for two people to come up with the exact same answer UNLESS copying occurs.

"Salem State College 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. *Any student who has a documented disability requiring an accommodation, aid or adjustment should speak with the instructor immediately*. 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."

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 21st**.

> **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 emails sent by the instructor.