

| Program Objective (condensed form) | CO01 | CO02 | CO03 | CO04 | CO05 | CO06 | CO07 | CO08 | CO09 | CO10 |
|--|------|------|------|------|------|------|------|------|------|------|
| PO-D: function effectively in teams to accomplish a common goal | | | | | | | | | | |
| PO-E: professional, ethical, and social responsibilities | | | | | | | | | | ✓ |
| PO-F: communicate effectively with a range of audiences | | | | | | | | | | |
| PO-G: local and global impact of computing on people and society | | | | | | | | | | ✓ |
| PO-H: need for continuing professional development | | | | | | | | | | |
| PO-I: use current techniques, skills, and tools | | | | | | | | | | |
| PO-J: apply theory and principles to model and design systems | | | | | | | | | | |
| PO-K: apply design and development principles in constructing software | | | | | | | | | | |
| note - full statements of the Program Outcomes (program objectives) for the Computer Science Major can be found in the document <i>Computer Science Major Program Educational Objectives and Program Outcomes</i> on the Assessment page of the Computer Science Major (cs.salemstate.edu) | | | | | | | | | | |

Topics:

- 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)**

Assignments: Extensive reading assignments in one or more textbooks cover the fundamental vocabulary and descriptive material. Written assignments, both computational and analytical, are used to deepen the student's understanding of fundamental ideas.

Each assignment has a specific due date, with a short grace period during which the assignment may be submitted for reduced credit. When the grace period has expired, the assignment will no longer be accepted, and a student who has failed to submit the assignment will have a penalty deducted from the term point-total.

Quizzes and examinations: There are periodic short quizzes (usually five quizzes, with the lowest quiz grade dropped), two one-hour examinations, and a comprehensive two-hour final examination.

No make-ups are given for missed quizzes or examinations.

Grading: Final grades will be determined using the following approximate weights: homework, 50%; quizzes, 20%; hour examinations, 18% (9% each); final examination, 12%.

Course Objective / Assessment Mechanism matrix

| | Homework Assignments | Quizzes | Hour Examinations | Final Examination |
|--|----------------------|---------|-------------------|-------------------|
| | | | | |

| | | | | |
|------|---|---|---|---|
| CO01 | | ✓ | ✓ | ✓ |
| CO02 | ✓ | ✓ | ✓ | ✓ |
| CO03 | | ✓ | ✓ | ✓ |
| CO04 | ✓ | ✓ | | ✓ |
| CO05 | ✓ | ✓ | | ✓ |
| CO06 | | | ✓ | |
| CO07 | ✓ | | ✓ | ✓ |
| CO08 | | ✓ | ✓ | ✓ |
| CO09 | ✓ | ✓ | | |
| CO10 | ✓ | | ✓ | ✓ |

Bibliography:

Anderson, Greg; Ferro, David; Hilton, Robert. **Connecting with Computer Science. Second Edition** Thompson Course Technology, 2010

Baase, Sara. **A Gift of Fire. Social, Legal, and Ethical Issues for Computers and the Internet. Third Edition.** Pearson Education, Inc., 2008

Bradley, Tony. **Essential Computer Security: Everyone's Guide to Email, Internet, and Wireless Security** (Illustrated). Syngress, 2007.

Briere, Danny; Hurley, Pat; & Ferris, Edward. **Wireless Home Networking for Dummies. Fourth Edition.** For Dummies (Publisher), 2010

Brookshear, J. Glenn. **Computer Science: An Overview. Eleventh Edition.** Addison-Wesley, 2010.

Dale, Nell; Lewis, John. **Computer Science Illuminated. Fourth Edition.** Jones & Bartlett, 2011.

Forouzan, Behrouz A. & Mosharraf, Firouz. **Foundations of Computer Science. Second Edition.** Cengage Learning Business Press, 2007.

Gregg, John R. **Ones and Zeroes. Understanding Boolean Algebra, Digital Circuits, and the Logic of Sets.** IEEE Press, 1998.

Hallberg, Bruce. **Networking: A Beginner's Guide. Fifth Edition.** McGraw-Hill Osborne Media, 2009.

Kizza, Joseph. **Ethical and Social Issues in the Information Age. Fourth Edition.** Springer, 2010.

Lowe, Doug. **Networking All-in-One Desk Reference for Dummies. Fourth Edition.** For Dummies (Publisher), 2010.

Reed, David. **Balanced Introduction to Computer Science. Third Edition.** Prentice Hall, 2010.

Sheely, Gary B. **Discovering Computers 2011: Complete.** Course Technology, 2010.

Spinello, Richard. **CyberEthics: Morality and Law in Cyberspace. Fourth Edition.** Jones & Bartlett, 2010.

White, Ron. **How Computers Work. Millennium Edition. Ninth Edition.** Que (Macmillan Computer Publishing), 2007.

Academic Integrity Statement:

“Salem State University assumes that all students come to the University with serious educational intent and expects them to be mature, responsible individuals who will exhibit high standards of honesty and personal conduct in their academic life. All forms of academic dishonesty are considered to be serious offences against the University community. The University will apply sanctions when student conduct interferes with the University primary responsibility of ensuring its educational objectives.” Consult the University catalog for further details on Academic Integrity Regulations and, in particular, the University definition of academic dishonesty.

The Academic Integrity Policy and Regulations can be found in the University Catalog and on the University 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. Copying without attribution is considered cheating in an academic environment - simply put, **do not do it!***

University-Declared Critical Emergency Statement:

In the event of a university-declared emergency, Salem State University reserves the right to alter this course plan. Students should refer to 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, which will be distributed via standing class communication protocols. Students should review the plans and act accordingly. Any required material that may be necessary will have been previously distributed to students electronically or will be made available as needed via email and/or Internet access.

Equal Access Statement:

"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. **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."

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 email.