∼ *High Relevancy* ∼

University of California, Santa Cruz   Computer Science & Engineering

CSE 222A   *VLSI Digital System Design*
Advanced Very Large Scale Integrated (VLSI) custom integrated circuits. Topics include: semiconductors; field-effect transistors (FETs); circuits; and interconnect simulation, along with advanced material on manufacturability, variability, short-channel devices, and non-volatile memories.

CSE 200   *Research and Teaching in Computer Science and Engineering*
Basic teaching techniques for teaching assistants, including responsibilities and rights of teaching assistants, resource materials, computer security, leading discussion or lab sessions, presentation techniques, maintaining class records, electronic handling of homework, and grading. The course examines research and professional training, including use of the library and online databases, technical typesetting, writing journal and conference papers, publishing in computer science and computer engineering, giving talks in seminars and conferences, and ethical issues in science and engineering. Required for all teaching assistants.

CSE 186   *Full Stack Web Development I*
Examines current uses of the World Wide Web for delivery of the sophisticated interactive applications used daily. Web applications offer several advantages over traditional, locally installable binaries including heterogeneous deployment, instantaneous access, continuous updates, and the possibility of collaboration at scale. These full stack web applications are typically more complex than their traditional counterparts, requiring the seamless integrating of numerous related technologies if end users are to have a productive experience and the system is to remain robust, performant, and secure.

CSE 185E   *Technical Writing for Computer Science and Engineering*
Writing by engineers and computer scientists to technical audiences. Writing exercises include: cover letter and resume for job application, tutorial writing, grant proposal, document specification, literature review, and a final technical report. Two oral presentations are also required, an in-class presentation and a poster presentation. Students also receive instruction in the use of UC library and journal database resources, and in the writing of a statement of purpose for graduate school application.

CSE 150 / CSE 150L   *Introduction to Computer Networks / Laboratory*
Addresses issues arising in organizing communications among autonomous computers. Network models and conceptual layers; Internet-working; characteristics of transmission media; switching techniques (packet switching, circuit switching, cell switching); medium access control (MAC) protocols and local area networks; error-control strategies and link-level protocols; routing algorithms for bridges and routers; congestion control mechanisms; transport protocols; application of concepts to practical wireless and wireline networks and standard protocol architectures. Lab illustrates the concepts covered in CSE 150 and provides students with hands-on experience in computer networks.

CSE 130   *Principles of Computer Systems Design*
Covers the principles governing computer-systems design and complexity; familiarity with memory, storage, and networking; concurrency and synchronization; layering (abstraction and modularity); naming; client-server and virtualized system models; and performance. Requires significant programming projects demonstrating mastery of these concepts.

CSE 123B   *Engineering Design Project II*
Second of two-course sequence in engineering system design. Students fully implement and test system designed and specified in CSE 123A. Formal written report, oral presentation, and demonstration of successful project to review panel of engineering faculty required.

CSE 123A   *Engineering Design Project I*
First of a two-course sequence that is the culmination of the engineering program. Students apply knowledge and skills gained in elective track to complete a major design project. Students complete research, specification, planning, and procurement for a substantial project. Includes technical discussions, design reviews, and formal presentations; engineering design cycle, engineering teams, and professional practices. Formal technical specification of the approved project is presented to faculty.

CSE 121   *Embedded System Design*
The design and use of microprocessor-based embedded systems. Covers microprocessor and microcontroller architecture, programming techniques, bus and memory organization, DMA, timing issues, interrupts, peripheral devices, serial and parallel communication, and interfacing to analog and digital systems.

CSE 120   *Computer Architecture*
Introduction to computer architecture including examples of current approaches and the effect of technology and software. Computer performance evaluation, basic combinatorial and sequential digital components, different instruction set architectures with a focus on the MIPS ISA and RISC paradigm. Evolution of CPU microarchitecture from single-cycle to multi-cycle pipelines, with overview of super-scalar, multiple-issue and VLIW. Memory system, cache, virtual memory and relationship between memory and performance. Evolution of PC system architecture. May include advanced topics, such as parallel processing, MIMD, and SIMD.

CSE 107 *Probability and Statistics for Engineers*

Introduction to fundamental tools of stochastic analysis. Probability, conditional probability; Bayes Theorem; random variables and transforms; independence; Bernoulli trials. Statistics, inference from limited data; outcomes of repeated experiments; applications to design; assessment of relative frequency and probability; law of large numbers; precision of measurements. Elements of stochastic processes, Poisson processes; Markov chains.

CSE 101 *Introduction to Data Structures and Algorithms*

Introduction to abstract data types and basics of algorithms. Linked lists, stacks, queues, hash tables, trees, heaps, and graphs will be covered. Students will also be taught how to derive big-Oh analysis of simple algorithms. All assignments will be in C/C++.

CSE 100 / CSE 100L *Logic Design / Laboratory*

Boolean algebra, logic minimization, finite-state machine design, sequential circuits, common logic elements, programmable logic devices, and an introduction to system level design. The electrical behavior of circuits including three state outputs, propagation delay, logic levels, and fanout. Two 2-hour laboratory sessions per week illustrating topics covered in course. Weekly laboratory assignments which require the use of oscilloscopes, TTL circuits, computer-aided design and simulation tools, and programmable logic.

CSE 13S *Computer Systems and C Programming*

Focuses on C programming, command line, shell programming, editors, debuggers, source code control, and other tools. Examines basic computer systems, algorithm design and development, data types, and program structures. Develops understanding of process model, compile-link-execute build cycle, language-machine interface, memory, and data representation.

CSE 12 *Computer Systems and Assembly Language and Lab*

Introduction to computer systems and assembly language and how computers compute in hardware and software. Topics include digital logic, number systems, data structures, compiling/assembly process, basics of the system software, and computer architecture.

University of California, Santa Cruz   Electrical & Computer Engineering

ECE 103 / ECE 103L *Signals and Systems / Laboratory*

Course covers the following topics: characterization and analysis of continuous-time signals and linear systems, time domain analysis using convolution, frequency domain analysis using the Fourier series and the Fourier transform, the Laplace transform, transfer functions and block diagrams, continuous-time filters, sampling of continuous time signals, examples of applications to communications and control systems. Use and operation of spectrum analyzers; advanced signal analysis using oscilloscopes; measuring impulse response, step response, frequency response, and computer analysis of real signals. MATLAB programming is taught and used as a tool for signal analysis.

ECE 101 / ECE 101L *Introduction to Electronic Circuits / Laboratory*

Introduction to the physical basis and mathematical models of electrical components and circuits. Topics include circuit theorems (Thevenin and Norton Equivalents, Superposition), constant and sinusoidal inputs, natural and forced response of linear circuits. Introduction to circuit/network design, maximum power transfer, analog filters, and circuit analysis using Matlab. Topics in elementary electronics including amplifiers and feedback.Laboratory illustrates topics covered in ECE 101. One two-hour laboratory session per week.

ECE 9 *Statics and Mechanics of Materials*

Theory and application of statics and mechanics of materials for mechanical and biomechanical systems. Covers statics of particles; equilibrium of rigid bodies; free-body diagrams; analysis of structure; friction; concepts of stress and strain; axial loading; torsion and bending; and failure criteria.

West Valley College   Computer Science

CIST 004B *Data Structures using Advanced C++*

This is a continuation of CIST 004A (Introduction to Computer Programming I-C++) intended for students majoring in CIS-Computer Science Option and/or planning to transfer to a 4-year college or university Computer Science program. CIST 004B introduces concepts of abstract data types, C++ classes, separate compilation, and information hiding. Topics in data structures (dynamic allocation, linked lists, stacks and queues, and binary trees), and sorting/searching algorithms are introduced. The course includes both lecture and programming in C++.

CIST 004A *Computer Programming I (C++ Programming)*

This is a foundation course emphasizing the concepts and methodologies of programming using the C++ language. Emphasis is on good programming style, object-oriented design, decomposition, encapsulation, abstraction, and testing. Example topics include memory allocation, flow control, logic, objects, classes, methods and argument passing, control structures, and iteration. Students have the opportunity to learn programming, documentation and software testing skills, algorithmic problem-solving, programming methodologies, and to write and debug small to medium-sized programs.

Mission College   Computer Information Systems

CIS 007   *Python Programming*
This is an introductory course in programming using Python. No prior programming experience is required. Students learn to design, code, and execute programs using the Python programming language and tools. This class covers basic programming skills such as data types, control structure, algorithm development, and program design with functions. It also includes lists, object-oriented programming and graphics programming concepts and topics.

∼   *Moderate Relevancy*   ∼

University of California, Santa Cruz   Applied Mathematics

AM 20   *Mathematical Methods for Engineers II*
Applications-oriented class on ordinary differential equations (ODEs) and systems of ODEs using Matlab as a computational support tool. Covers linear ODEs and systems of linear ODEs; nonlinear ODEs using substitution and Laplace transforms; phase-plane analysis; introduction to numerical methods.

University of California, Santa Cruz   Physics

PHYS 5C / PHYS 5N   *Introduction to Physics III / Laboratory*
Introduction to electricity and magnetism. Electromagnetic radiation, Maxwell's equations. Laboratory sequence illustrating topics covered in PHYS 5C. One three-hour laboratory session per week.

West Valley College   Engineering

ENGR 010   *Introduction to Engineering*
This introductory course explores the different engineering disciplines to assist students in a choice of a major in engineering. Prospective engineering students have the opportunity to learn about experimentation, data analysis, problem-solving, engineering software, basic computer programming, and the engineering design process.

West Valley College   Mathematics

MATH 019   *Discrete Mathematics*
This course covers fundamental topics for Computer Science, such as logic, proof techniques, sets, introduction to computer programming, basic counting rules, relations, functions and recursion, graphs and probability trees.

MATH 004C   *Linear Algebra*
This course develops the techniques and theory needed to solve and classify systems of linear equations. Solution techniques include row operations, Gaussian elimination, and matrix algebra. It investigates the properties of vectors in two and three dimensions, leading to the notion of an abstract vector space. Vector space and matrix theory are presented including topics such as inner products, norms, orthogonality, eigenvalues, eigenspaces, and linear transformations. Selected applications of linear algebra are included.

MATH 004A   *Intermediate Calculus*
This course covers vector-valued functions, calculus of functions of more than one variable, partial derivatives, differentials, gradients, Lagrange Multipliers, multiple integration, line integrals, surface integrals, Green's Theorem, Stokes' Theorem, and the Divergence theorem.

MATH 003B   *Calculus and Analytical Geometry*
This is a second course in differential and integral calculus of a single variable: integration, techniques of integration, infinite sequences and series, polar and parametric equations, and applications of integration. This course is primarily for science, technology, engineering & math majors.

West Valley College   Physics

PHYS 004A   *Engineering Physics - Mechanics*
This is the first semester of a three-semester Physics sequence intended for students majoring in Physical Sciences and Engineering. Mechanics is the first course in the Engineering Physics series. The course introduces students to concepts such as vectors, kinematics, dynamics, energy, momentum, universal gravity, rotational physics, fluid dynamics, and elasticity.

∼   *Low Relevancy*   ∼

West Valley College   Business Administration

BUSN 051   *Introduction to Business*
This course provides the student an introduction to American business in a global and culturally diverse environment, providing an overview of economics, ethics, management, marketing, operations, information management, accounting, and finance.

BUSN 028H   *Honors Business Law*
Honors Business Law uses the pedagogical methods common to all Honors courses: interdisciplinary, writing-intensive, collaborative, and experiential instruction. The course requires a higher level of critical legal analysis beyond the non-honors section. This course is an introduction to the law and its relevance to business in general. The course introduces the meaning and sources of law in business, the organization of courts and court procedures, and the fundamental principles of the law in various aspects of business, with a particular focus on contract law. A fundamental understanding of common law principles is examined by analyzing selected cases, court decisions, and business transactions. Topics covered include sources of law and ethics, constitutional law, the court system, contracts, torts, agency, labor and employment, real property, product liability, criminal law, business organizations, and judicial and administrative processes.

West Valley College   Economics

ECON 001BH   *Honors Principles of Microeconomics*
Honors Principles of Microeconomics uses the pedagogical methods common to all Honors courses: trans-disciplinary, writing-intensive, collaborative, and experiential instruction. As an honors course, there is a focus on analytical writing and an emphasis on a higher degree of student participation and leadership in class discussions and other interactive teaching/learning techniques that are generally unsuitable for larger undergraduate courses. This course provides an introduction to microeconomic analysis which focuses on individual economic decision-makers and markets. Topics include scarcity and allocation of resources, distribution of income and wealth, market equilibrium, price ceilings/floors, elasticity, consumer theory, cost/production analysis, market structures, factor markets, market failure, international trade and finance, and the role of public policy in the economy.

ECON 001AH   *Honors Principles of Macroeconomics*
Honors Principles of Macroeconomics uses the pedagogical methods common to all Honors courses: trans-disciplinary, writing-intensive, collaborative, and experiential instruction. As an honors course, there is a focus on analytical writing and an emphasis on a higher degree of student participation and leadership in class discussions and other interactive teaching/learning techniques that are generally unsuitable for larger undergraduate courses. This course provides an introduction to aggregate economic analysis, including the analysis of: market systems; aggregate measures of the economy; macroeconomic equilibrium; money, the banking system and the role of central banks; monetary and fiscal policy; international trade and exchange rates; and macroeconomic growth.

∼   *No Relevancy*   ∼

University of California, Santa Cruz   Kresge College

KRSG 25   *Successful Transfer to the Research University*
Provides community college transfers, during their first year at UC Santa Cruz, with an understanding of the workings of a research university with emphasis on advanced academic expectations, creating and meeting purposeful education and career goals, building relationships and community, and navigating opportunities and challenges.

KRSG 1T   *Introduction to Research Universities and the Liberal Arts*
Orientation to and exploration of principles of liberal arts, and learning at research universities. Topics include: academic planning for upper-division coursework; enrollment processes at UCSC; understanding pathways to degree completion (and the major and general-education coursework required in those pathways). Students also learn about UCSC's principles of community, and engage in preliminary reflection on reading and critical thinking.

West Valley College   Biology

BIOL 010 / BIOL 010L   *Introduction to Biology / Laboratory*
This is an introductory course in general biology designed for non-science majors. Emphasis is on using critical thinking skills to understand and apply biological principles to the solution of everyday problems. Topics discussed include the scientific method, evolution, ecology, cell function and structure, cell energy, DNA and biotechnology, as well as how organisms interact with their internal and external environment.

West Valley College   Counseling

COUN 000A   College Orientation
College Orientation is an introductory course that highlights community college, career, and transfer opportunities as well as strategies for academic success. The course includes an orientation to West Valley College programs and services, rules and regulations, an overview of general education requirements for transfer and graduation, an introduction to the registration process, and educational planning.

West Valley College   English

ENGL 001C   *Critical Thinking and Writing*
This course offers instruction and practice in methods of critical thinking and formal argument writing, emphasizing the following: the principles of classical argument structure and methods of reasoning; analysis and evaluation of rhetorical argument; identification of the assumptions underlying a given argument; identification and critique of fallacies in arguments; and analysis of language use and its implications in argument writing. Students in this course have the opportunity to practice critical thinking by writing substantive arguments, essays, and a documented research paper.

ENGL 001A   *English Composition*
This course introduces the techniques of collegiate English composition with emphasis on clear and effective writing and analytical reading. Instructors guide students in writing a series of essays including a documented research paper. Because this is a collegiate-level writing course, students must enroll with strong grammatical competence.

West Valley College   Kinesiology Theory

KINT 030   *Introduction to Kinesiology*
This course is an introduction to the discipline of kinesiology and the study of human movement. An overview of the seven sub-disciplines in kinesiology are discussed. A brief overview of the major historical events, research methods, and what professionals do in the subdisciplines of philosophy, history, sociology, motor behavior, psychology, biomechanics, and physiology are included. The course explores career opportunities in five common areas: health and fitness; therapeutic exercise; physical education; coaching and sport instruction; and sport management and law. The study of kinesiology is used to promote physical activity for the benefit of all people.

West Valley College   Philosophy

PHIL 001   *Introduction to Philosophy*
This course introduces philosophical ideas and methods concerning knowledge, reality, and values. Expected topics include the sources and limits of knowledge and the nature of reality. Other topics that may be examined from a philosophical perspective include the nature of the self, truth, ethics, religion, science, language, beauty and art, political theory, or mind.

West Valley College   Political Science

POLI 001   *American Government*
This course covers the structure and functions of the American national, state and local governments. Emphasis is placed on the development of democratic institutions through historical and contemporary studies. Students have the opportunity to learn what has shaped the United States Constitution, its amendments, and the operation of one's role in a democratic government.

West Valley College   Theater Arts

THEA 014C   *Survey of Film: Gangster and Detective Films*
This is an introductory film course in which primary focus is placed on the cinematic development of gangster and detective films. Critical analysis from an audience perspective includes readings, lectures, and discussions covering genre conventions, history, evolution, terminology, and technique.

THEA 014A   *Survey of Film: Horror and Science Fiction*
This is an introductory film course in which primary focus is placed on the cinematic development of genre classics in Horror and Science Fiction. Critical analysis from an audience perspective includes readings, lectures, and discussions covering conventions, history, evolution, terminology, and technique.