

TECHNOLOGY STUDIES: CET • CNET

BEFORE ENROLLING IN DEGREE APPLICABLE COURSES, IT IS RECOMMENDED THAT YOU COMPLETE ENGL 001A AND READ 053.

COMPUTER ELECTRONICS TECHNOLOGY

(CET)

The Computer Electronics Technology (CET) is an option within the broader based CNET program that offers an A.S. Degree and a Certificate. The CET option offers a broadly based course of study with a strong emphasis on computers. The course of study is designed to train students for a wide variety of technical jobs, and touches on all of the major aspects of the high-tech industry: basic electronics, mathematics, solid state, analog, digital, programmable logic, microprocessors, circuit simulation, object-oriented programming, A+ certification, telecommunications, networking, wireless, and many other areas of elective study. Most classes are supported by hands-on laboratory experience. Selected classes will transfer to a comparable 4-year program, such as the Electronics and Computer Technology B.S. degree offered by San Jose State University. (The CET option is NOT intended to transfer into a B.S. degree in Electrical Engineering [EE].)

Student Learning Outcomes:

Upon completion of the CET option, the student will be able to:

- Design, solve, troubleshoot, and measure a variety of analog/digital circuits and systems.
- Use a variety of generating and measuring instruments, such as DMVs and digital oscilloscopes
- Write and debug programs using languages (such as C#)
- Design, analyze and troubleshoot a variety of circuits and systems using a circuit simulator (such as PSpice)
- Pass the A+ Certification Exam with reasonable certainty
- Explain the structure and operation of various networks (such as PSTN, LANs and WANs)

Students will be assessed through a multitude of assessment methods

Including written quizzes, laboratory assignments, and group projects.

Highlights:

- Solid foundation in basic electronics, with a strong emphasis on computer technology
- A board-based comprehensive curriculum addressing the needs of both the transfer and non-transfer student
- Excellent state-of-the-art laboratory facilities
- Extensive use of PSpice circuit simulation
- In-depth A+ Certification preparation

Career Choices -

- Customer service support
- Assistant programmer
- Technical sales
- Design/Engineering aide
- Entry-level engineer
- Electronics/Computer Tech

A.S. Degrees/Certificate:

Computer Electronics Technology +

Only courses completed with a grade of C or better may be used to satisfy requirements for a Certificate.

Schedule Matrix (subject to change):

COURSE	FALL	SPRING	SUMMER	WEEKEND
CNET 052	E	E		
CNET 062	E			
CNET 063		E		
CNET 071	E			
CNET 073		E		
CNET 078	E			
CNET 079		E		
CNET 082	E			
CNET 083		E		
CNET 088A	E			
CNET 088B		E		
CNET 090A	E			
CNET 090B		E		

E= EVENING CLASSES

Computer Electronics Technology A.S. Degree and Certificate

Core Curriculum Courses (Required)	Units
CNET 052 DC Circuit Theory and Analysis	4.0
CNET 062 AC Circuit Theory and Analysis	4.0
CNET 063 Digital/Programmable Logic.....	4.0
CNET 071 Solid State Devices and Circuits.....	4.0
CNET 073 Microprocessors/Microcontrollers	4.0
CNET 078 Telecommunications/Networking	3.0
CNET 082 Analog/Circuit Simulation/Calculus	3.0
CNET 083 Object-Oriented Programming	4.0
CNET 090A..... Computer Service Tech (A+) - Hardware	4.0
CNET 090B Computer Service Tech (A+) - Operating System.....	4.0
Plus 3 units from the following:**	Units
(**Other course work can be accepted for credit upon approval of the department)	
CNET 060 Science: How Changed World	3.0
CNET 066A..... Level I: Eng. High-Tech Assembly	3.0
CNET 066B Level II: Eng. High-Tech Assembly	3.0
CNET 067 Computer Diagnostics, Repair and Upgrade	3.0
CNET 077 Inside the IBM PC	2.0
CNET 079 Adv. Software Design.....	3.0
CNET 081 Intro to Local Area Networking.....	3.0
CNET 084 Circuit Simulation Using PSpice.....	3.0
CNET 088A..... Introduction to RF/Microwave/Wireless	3.0
CNET 088B Advanced RF/Microwave/Wireless	3.0
CNET 177 Laboratory Skills	0.5
DRAFT 058A Electronics Drafting.....	3.0
Total Program A.S. Degree/Certificate Requirements:.....	41.0

COMPUTER NETWORKING ELECTRONICS TECHNOLOGY (CNET)

041 • TCP/IP FOR THE PC

3.0 units

Total Lecture 54.4 hours

Advisory: MATH 903

Acceptable for credit: California State University

This course will introduce students to the Transmission Control Protocol / Internet Protocol (TCP/IP) suite for the PC platform. The course also covers the fundamentals of the Internet and the most popular Internet applications for DOS and Windows (Windows 9x/ME, Windows 2000/XP). Students will also learn the basics of Internet Protocol (IP) routing, including the concept of the Domain Name System (DNS), and the Intranet. *Pass/No Pass Option.*

042 • INTRO TO NETWORK OPERATING SYSTEMS

3.0 units

Total Lecture 54.4 hours

Advisory: MATH 903

Acceptable for credit: California State University

This course is designed to give an overview of major Network Operating systems (NOS) to students in the Networking Technology area. The course will cover the basic network features of Microsoft Windows NT, Novell Netware and UNIX. Students will also learn the security features, the file system, and the network management of the Network Operating System. *Pass/No Pass Option.*

043 • ROUTER AND INTERNETWORKING FUNDAMENTALS

3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours

Advisory: CET/CIS 081 and CNT 041

Acceptable for credit: California State University

This course is designed to introduce students to the fundamentals of interconnecting computer networks. The course covers the basics of internetworking components such as repeaters, hubs, bridges, switches, routers, and gateways. Topics also include Local Area Network (LAN) protocols, Virtual LAN (VLAN) concepts, Wide Area Network (WAN) technologies and protocols, and major routing protocols includes Distance-Vector and Link-State routing protocol. *Pass/No Pass Option.*

BEFORE ENROLLING IN DEGREE APPLICABLE COURSES, IT IS RECOMMENDED THAT YOU COMPLETE ENGL 001A AND READ 053.

044 • NETWORK MANAGEMENT FUNDAMENTALS 3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours
Advisory: CNET 041, CNET 043 and CNET 081
Acceptable for credit: California State University

This course is designed to introduce students to the fundamentals of network management. The course covers the basics of SNMP protocol, including SNMP software and hardware support. Topics also include guidelines for effective use of SNMP tools in managing typical small to medium networks. *Pass/No Pass Option.*

045 • INTRODUCTION TO LAN/WAN DESIGN 3.0 units

Total Lecture 54.4 hours
Advisory: CNET 041, CNET 043 and CNET 081
Acceptable for credit: California State University

This course is designed to introduce students to the basics of network design. The course covers the fundamentals of network design principles including guidelines and design goals for the LAN and WAN environment, and network issues such as network traffic and scalability. Topics also include routing fundamentals, user requirements, bandwidth consideration, and layout process. *Pass/No Pass Option.*

046 • ROUTING AND SWITCHING TECHNOLOGY 3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours
Advisory: CNET 041, CNET 043 and CNET 081
Acceptable for credit: California State University

This is a comprehensive course in all important aspects of routing and switching technology. The course covers the basics of IP routing concepts, router configuration, router operating systems, routing protocols, multi-layer switching technology, switch configuration and switching protocols. Topics also include TCP/IP, routing hardware, layer-3 switching, routing diagnostics, and network analysis. *Pass/No Pass Option.*

047 • ADVANCED NETWORK PROTOCOLS 3.0 units

Total Lecture 54.4 hours
Advisory: CNET 041 and CNET 043
Acceptable for credit: California State University

This is a comprehensive course in network protocols. The course covers the advanced topics in TCP/IP including in-depth analysis of related network protocols such as ARP, ICMP, IGMP, BootP, DHCP, Frame Relay, ATM, xDSL, ISDN. Topics also include CIDR, VLSM, Novell IPX, NetBIOS, AppleTalk, Voice over IP (VoIP), mobile IP, detailed analysis of the new IP v6 and its potential impact on the Internet. *Pass/No Pass Option.*

052 • DC CIRCUIT THEORY AND ANALYSIS 4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours
Advisory: MATH 903
Acceptable for credit: California State University

A comprehensive introductory course in electronics. DC voltages, resistance, series and parallel circuits. An introduction to voltage and current divider rules. Thevenin's theorems, and other pertinent DC concepts. Emphasis is on lab procedures and use of electronic test equipment. *Materials Fee: \$20.00. Grade Only.*

053 • ELECTRONICS CALCULATIONS 3.0 units

Total Lecture 54.4 hours
Advisory: MATH 903
Acceptable for credit: California State University

A study of advanced algebraic and trigonometric concepts as they pertain to AC electronics: sine waves, vector algebra, complex number, decibels, and time constants. Use of a scientific calculator in solution of problems is emphasized. *Grade Only.*

055 • THE IBM PC: A TECHNICAL INTRODUCTION 3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours
Advisory: MATH 903
Acceptable for credit: California State University

This is a technically-based course on the IBM PC and clones, and covers how it works as well as how to use it. Topics include: the central processing unit, instruction processing, disk memory, video systems, printers; networking; operating system fundamentals, introductory programming; and a brief overview of major applications. (Also listed as CIS 55). *Pass/No Pass Option.*

060 • SCIENCE: HOW IT HAS CHANGED OUR WORLD 3.0 units

Total Lecture 54.4 hours
Advisory: MATH 000C
Acceptable for credit: California State University

This course will deal with the union of science and technology. These technologies will include applications of physics, chemistry, biology, electronics, computer science and others as applied to such fields as computers, medicine, communications, navigation, LASERS, meteorology, and nuclear power generation. The roots of basic science will be stressed. These concepts will be reinforced by classroom demonstrations and field trips. It is designed for science and non-science majors alike. All students are welcome. No previous knowledge and background in science or technology is required, and the level of mathematics is limited to elementary algebra. *Pass/No Pass Option.*

062 • AC CIRCUIT THEORY AND ANALYSIS 4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours
Advisory: MATH 903 and CET 052
Acceptable for credit: California State University

A comprehensive introductory course in electronics covering AC theory. Includes sinusoidal waveforms, AC measurements, AC series circuits, AC parallel circuits, RC filters, series and parallel resonant circuits, transformers, and the use of electronic instruments including the DMM, frequency generator, frequency counter and oscilloscope in the lab. *Grade Only.*

063 • DIGITAL/PROGRAMMABLE LOGIC 4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours
Advisory: MATH 903 and CET 052
Acceptable for credit: California State University

This is a comprehensive course in digital electronics, including basic number systems, shift registers, counters, multiplexers, arithmetic logic units, and fundamentals of design and application. Course will include computer-aided design using programmable logic. All theoretical concepts will be reinforced by practical lab applications. Student projects will be breadboarded and tested using digital designers, oscilloscopes and meters. *Grade Only.*

064 • MICROCOMPUTER SOFTWARE DESIGN 3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours
Advisory: MATH 903
Acceptable for credit: California State University

This course will cover the major aspects of software design in a product development environment. A high-level structured language such as C or Java will be the primary programming language. Additional topics may include structured design and software development techniques. *Grade Only.*

066A • LEVEL I-INTRODUCTION TO ENGINEERING HIGH-TECH ASSEMBLY(THROUGH-HOLE/SMT) 3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours
Acceptable for credit: California State University

This is a fundamental, overview course on engineering high-tech assembly. Coverage includes such topics as micro-electronic production, touch-up, component preparation and replacement as applied to multi-layer PC boards, component package processes, cabling, and hardware assembly. This course is designed to provide a total understanding of current engineering practices on high-tech PC board production process with Through-Hole(TH), Mixed-Tech(MT), and Surface Mounted(SM) Technologies. *May be repeated one time. Pass/No Pass Option.*

066B • LEVEL II-ENGINEERING ASSEMBLY REWORKS TECHNICIAN(EART) ON MIXED TECHNOLOGY 3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours
Acceptable for credit: California State University

This is a second level high-tech manufacturing engineering assembly course on microelectronic production, touch-up, and engineering rework as applied to multi-layer PC boards. The course focuses on Engineering Change Notation(ECN) includes PCB and rework troubleshooting, bridging methodology, trace and pad replacement, and defective trace repair. This course is designed to provide the current engineering technician with a complete understanding of, as well as practical skills related to, the essential high-tech PC board production process with Mixed-Tech and Surface Mounted technologies. *May be repeated one time. Pass/No Pass Option.*

TECHNOLOGY STUDIES: CNET

BEFORE ENROLLING IN DEGREE APPLICABLE COURSES, IT IS RECOMMENDED THAT YOU COMPLETE ENGL 001A AND READ 053.

067 • COMPUTER DIAGNOSTICS, REPAIR, AND UPGRADE

3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours

Advisory: MATH 903

Acceptable for credit: California State University

This is an introductory course on the diagnostics, repair, and upgrade of IBM PC/clones. This course requires no previous experience with computers, and is designed to provide for a wide range of needs: from entry-level high-tech positions, to job retraining, to skill upgrading. This course will include hardware configuration, software diagnostics, maintenance procedures, memory upgrade, floppy and hard disk installation and setup, power supply analysis, troubleshooting, and much more. *May be repeated one time. Pass/No Pass Option.*

071 • SOLID STATE DEVICES AND CIRCUITS

4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours

Advisory: MATH 903 and CET 052

Acceptable for credit: California State University

A comprehensive course in semiconductor devices and circuits, including diode, bipolar and FET transistor characteristics and specifications. Emphasis is on biasing and DC/AC analysis of amplifier and buffer configurations. Practical applications include amplifiers, power supplies, regulators, and other circuits and systems. Practical lab exercises will reinforce the theoretical concepts. *Grade Only.*

073 • MICROPROCESSORS/MICROCONTROLLERS

4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours

Advisory: MATH 903 and CET 063

Acceptable for credit: California State University

This is a comprehensive course on microprocessors and microcontrollers, featuring a balanced hardware/software approach. Emphasis will be on the Intel family of microprocessors. Laboratory experience will emphasize hardware design, assembly-language programming, and basic concepts of interfacing and troubleshooting. *Grade Only.*

077 • INSIDE THE IBM PC

2.0 units

Total Lab 36.8 hours

Advisory: MATH 903

Acceptable for credit: California State University

This is an intermediate-level technically-based course on the IBM PC. It emphasizes system hardware, operating system theory, and design of IBM PC and compatible computers. Topics include: video formats, disk and keyboard basics, ROM BIOS software, DOS interrupts, RS232 serial interface, PC bus structure, DMA, mouse, coprocessors, modems, sound, and structure of EXE files. *Pass/No Pass Option.*

078 • TELECOMMUNICATIONS/NETWORKING

3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours

Advisory: MATH 903

Acceptable for credit: California State University

This is an introductory course in telecommunications and networking. Topics include related computer hardware and software, the PLL, PCM, the phone system, modems, DSL, fiber optics, error correction, and local and wide-area networks. Theory is enhanced by laboratory and demonstration experience. *Pass/No Pass Option.*

079 • C# PROGRAMMING AND .NET FRAMEWORK

3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours

Advisory: MATH 903 and CET 083

Acceptable for credit: California State University

This class provides a comprehensive description of the C# language. The students will learn this new art of programming that goes beyond the programming heritage from C/C++, Visual Basic, and Java. *Grade Only.*

082 • ANALOG/CIRCUIT SIMULATION/CALCULUS

3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours

Advisory: MATH 903 and CET 052

Acceptable for credit: California State University

This course stresses operational amplifier (OP AMP) theory and application as applied to closed-loop feedback systems. Topics covered include feedback configurations, active filters, oscillators, and A/D converters. Calculus is introduced during the presentation of integrators and differentiators. Practical laboratory experience will emphasize computer circuit simulation. *Grade Only.*

083 • OBJECT-ORIENTED PROGRAMMING

4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours

Advisory: MATH 903 and CET 064

Acceptable for credit: California State University

This is an introductory class in software design using an object-oriented programming language such as C++, Java, or C#. Course includes such topics as arrays, classes, inheritance, graphical user interface (GUI), interaction, animation, and multi-threading. Emphasis will be on direct hands-on laboratory experience. *Grade Only.*

084 • CIRCUIT SIMULATION USING PSpICE

3.0 units

Total Lecture 44.8 hours, Total Lab 27.2 hours

Advisory: MATH 903

Acceptable for credit: California State University

This is an introductory course on circuit simulation using PSpice for Windows. It is appropriate for students or working professionals. Topics include: drawing circuits, displaying waveforms, Monte Carlo analysis, parametric analysis, Fourier analysis, complex numbers, and many more. Simulated applications circuits include DC, AC, devices & circuits, operational amplifiers, and digital systems. No previous experience with circuit simulation is required, although a basic knowledge of DC/AC and Devices and Circuits would be helpful. *Grade Only.*

088A • INTRODUCTION TO RF/MICROWAVE/WIRELESS (Formerly known as CET 088)

3.0 units

Total Lecture 54.4 hours

Advisory: CET 062

Acceptable for credit: California State University

This is an introductory course providing a conceptual understanding of RF/Microwave Components, such as amplifiers, filters, oscillators, synthesizers, mixers, etc. Coverage includes RF systems such as Broadcasting, Radar, Satellite, and Fixed Wireless. It simplifies the subject of RF electronics through the use of analogies and metaphors. Students will learn the vocabulary and jargon used throughout the industry. *Pass/No Pass Option.*

088B • ADVANCED RF/MICROWAVE/WIRELESS

3.0 units

Total Lecture 54.4 hours

Advisory: CET 088A

Acceptable for credit: California State University

This is an advanced course providing a conceptual understanding of RF/Microwave Components, such as transmission line theory, wave guides, amplifiers, filters, oscillators, synthesizers, mixers, etc. The course includes Maxwell equations and wave propagation. *Pass/No Pass Option.*

090A • COMPUTER SERVICE TECHNICIAN (A+) HARDWARE

4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours

This course covers the Core Hardware portion of the two-part A+ Certification exam. The course covers a basic knowledge of installing, configuring, upgrading, troubleshooting, and repairing desktop computer systems. Theory will be supported and reinforced by direct hands-on laboratory experience. *Grade Only.*

090B • COMPUTER SERVICE TECHNICIAN (A+) OPERATING SYSTEMS

4.0 units

Total Lecture 54.4 hours, Total Lab 54.4 hours

This course covers the Core Operating System portion of the two-part A+ Certification exam. Major topics include a basic knowledge of Command Line Prompt, Windows 9x and Windows 2000 for installing, configuring, upgrading, troubleshooting, and repairing desktop computer systems. Theory will be supported and reinforced by direct hands-on laboratory experience. *Grade Only.*

177 • LABORATORY SKILLS

0.5 units

Total Lab 27.2 hours

Advisory: MATH 903

Students will improve their laboratory and programming skills through guided laboratory work related to the CNET program course of study. *May be repeated two times. Pass/No Pass Option.*