Electronics Technology, A.A.S.

Electronics technology influences almost every aspect of modern life. Skilled electronics technicians are needed to support growth in this industry. These technicians must be able to fabricate, test, install, operate and maintain highly technical systems such as communications systems, computers and computer networks, and industrial process control systems. The program focuses on the underlying principles of electronic devices, circuit analysis and digital electronics and will provide a broad systems view of electronics.

Students in the electronics program will work with outstanding facilities and the latest laboratory equipment. Graduates of the program will have the opportunity for employment in one of today's most challenging and exciting career fields.

Program graduates also have the opportunity to pursue a baccalaureate degree (B.S.E.E.T.) in electronics engineering technology through the transfer of JCCC electronics technology and other courses to participating four-year institutions. Students contemplating this option should seek early counseling and prepare a program plan with specific course selections in anticipation of four-year institution requirements. Students should be prepared to enroll in higher-level math and physics courses when compared with current electronics technology program requirements.

Students who are transferring to JCCC with significant numbers of electronic technology credits should be aware that at least 9 credit hours of approved electronic technology courses must be completed at JCCC before the A.A.S. degree will be awarded. In addition, because of changes in technology, students who desire to graduate using electronics technology courses completed more than seven years ago should seek counseling regarding the current relevance of those courses.

(Major Code 2690; State CIP Code 47.0101)

- Electronics Technology (http://www.jccc.edu/electronics)

Associate of Applied Science Degree

First Semester

ELEC 120	Introduction to Electronics	3
ELEC 126	Microcomputer A+ Preparation	4
ELEC 125	Digital Electronics I	4
MATH 130	Technical Mathematics I* (or higher)	3
ENGL 121	Composition I*	3
Total Hours		17

Second Semester

ELEC 122	Circuit Analysis I*	3
ELEC 225	Digital Electronics II*	3
MATH 131	Technical Mathematics II* (or higher)	3
SPD 125	Personal Communication	3
Humanities Elective ^		3
Total Hours		15

^ Humanities Elective (http://catalog.jccc.edu/fall/degreecertificates/electives/humanities-aas)

Third Semester

Technical Elective (see below)		3
ELEC 130	Electronic Devices I*	4
ELEC 140	Circuit Analysis II*	3
ENGL 123	Technical Writing I*	3
Social Science/Economics Elective ^		3
Total Hours		16

^ Social Science/Economics Elective (http://catalog.jccc.edu/fall/degreecertificates/electives/social-sci-econ-aas)

Fourth Semester

Technical Elective (see below)		3
ELEC 230	Electronic Devices II*	3

ELEC 240	Electronic Communication Systems*	4
PHYS 133	Applied Physics* (or higher)	5
Health and/or Physical Education Elective ^		1
Total Hours		16

^   Health and/or Physical Education Elective (http://catalog.jccc.edu/fall/degreecertificates/electives/health-and-or-physical-ed-aas)

Technical Electives

ELEC 118	Mobile Auto Electronics Installation	3
ELEC 127	Robots for Humans	4
ELEC 131	Introduction to Sensors and Actuators	3
ELEC 133	Programmable Controllers	3
ELEC 165	Advanced Programmable Controllers*	3
ELEC 185	LAN Cabling and Installation	3
ELEC 250	Microcomputer Maintenance*	3
ELEC 271	Electronics Internship I*	1

Total Program Hours: 64

Courses

ELEC 118 Mobile Auto Electronics Installation (3 Hours)
This course covers after-market AM-FM and HD radios, audio amplifiers, security systems, DVD video systems and GPS navigation systems. Other topics covered will include how to determine the customers? requirements and then advising them of the best equipment to purchase. Students will receive hands-on instruction on installing and configuring mobile electronics systems. 2 hrs. lecture & 3 hrs. instructional lab/wk.

ELEC 120 Introduction to Electronics (3 Hours)
This is a beginning course in electronics technology that is appropriate for both electronic majors and other interested students. An overview of basic electronic theory, principles and components is presented. In addition, the laboratory exercises will emphasize the operation and use of the primary pieces of electronic test equipment and the fabrication of selected circuits. 2 hrs. lecture, 2 hrs. lab-lecture, 2 hrs. lab/wk.

ELEC 122 Circuit Analysis I* (3 Hours)
Prerequisites: ELEC 120 and either MATH 133 or MATH 130 or MATH 171

This course covers resistive circuits having DC sources. Analysis topics include Ohm's law, Kirchoff's law, the superposition theorem, Thevenin's theorem and Norton's theorem. The current, voltage and resistance relationships in series, parallel and combination circuits will be studied. 3 hrs. lecture/wk.

ELEC 123 Smart House Technology (3 Hours)
This course is a general introduction to the rapidly growing field of home technology and its integration and use. Lectures, demonstrations and lab work will be used to teach the types of home technology being sold and installed. This course is designed to assist new users to implement this technology in their own homes and as an introduction for students wanting to proceed further into the field as contractors or installers. 3 hrs. lecture/wk.

ELEC 125 Digital Electronics I (4 Hours)
This is a beginning course in which students will study and practice the basic concepts of digital electronics. Topics will include digital number systems, logic gates, logic circuits, flip-flops, digital arithmetic, counters and registers. 3 hrs. lecture, 3 hrs. open lab/wk.

ELEC 126 Microcomputer A+ Preparation (4 Hours)
This course is designed to be a general introduction to personal computer hardware and operating system software. The course teaches the operation, installation and upgrade of all the major components of a typical PC. The course also provides the basic knowledge to prepare the student for passing the A+ test, which is the industry standard certification for personal computer technicians. Since A+ Certification is based upon the Windows Operating System and Intel/AMD-type microprocessors, these will be the basis of the course. The course will cover both of the A+ Certification testing areas: PC Hardware (Core Test) and Operating Systems (OS Test). 3 hrs. lecture, 3 hrs. lab/wk.

ELEC 127 Robots for Humans (4 Hours)
This course is a general introduction to the rapidly growing field of robotics. The class will use lectures, demonstrations and lab work to teach the basics of robotics. This course is designed to assist new users in making use of this technology in their own lives and as an introduction for students wanting to proceed further into the field. 3 hrs lecture, 2 hrs open lab/wk.

ELEC 130 Electronic Devices I* (4 Hours)
Prerequisites or corequisites: ELEC 140

This is the first course in electronic devices. Topics include diodes and transistors, special purpose diodes and diode application circuits. Both bipolar junction transistors (BJTs) and field effect transistors (FETs) are examined and application circuits for both transistor types are constructed. 3 hrs. lecture, 3 hrs. lab/wk.

ELEC 131 Introduction to Sensors and Actuators (3 Hours)
This course examines types and uses of industrial sensors and actuators. Topics include temperature, pressure, optical, position and flow sensors. Operation of AC and DC motor drives will also be covered. The course will also include wiring and troubleshooting of sensors and actuators. Lecture topics will be supported by hands-on lab projects. 2 hrs. lecture, 3 hrs. lab/wk.

ELEC 133 Programmable Controllers (3 Hours)
This is an introductory course in programmable logic controllers. The course is designed for individuals without extensive electrical or controller backgrounds. Hardware aspects and programming aspects of controller operation are covered. The foundational controller logic symbols and controller logic operations necessary to interpret and write ladder logic programs are taught in this class. Students will enter, edit and test controller programs through assigned laboratory projects. 2 hrs. lecture, 3 hrs. lab/wk.

ELEC 140 Circuit Analysis II* (3 Hours)
Prerequisites: ELEC 122 and (MATH 131 or MATH 172 or MATH 173)

The analysis techniques presented in Circuit Analysis I will be applied to complex circuits driven by AC and pulsed sources. The responses of circuits having resistance, inductance and capacitance will be analyzed. Other topics include transformers and electrical filters. 3 hrs. lecture/wk.

ELEC 165 Advanced Programmable Controllers* (3 Hours)
Prerequisites: ELEC 133

This course is a continuation of ELEC 133. Principle topics include sequences, file and block transfers, analog control and PID functions. In addition, methods of networking of PLCs and advanced user interfaces will be covered. Lecture topics will be supported by laboratory projects. 2 hrs. lecture, 3 hrs. lab/wk.

ELEC 185 LAN Cabling and Installation (3 Hours)
This course is designed to provide specialized skills for installing and testing local area network cabling and wireless installation. Twisted-pair, coax and fiber cables will be introduced and contrasted based on their characteristics and applications. Laboratory exercises for terminating and testing network cables and installing wireless systems will accompany the lectures. Students will be trained how to use common wiring tools and testing instruments. Methods of documenting LAN systems will also be introduced. 2 hrs. lecture, 3 hrs. lab/wk.

ELEC 225 Digital Electronics II* (3 Hours)
Prerequisites: ELEC 125

Students will continue their study of digital concepts and will learn how to build digital circuitry using digital integrated circuit chips and basic concepts of computer organization. In additional, emphasis will be placed on learning how to troubleshoot digital circuits and digital systems. Each student will build a digital computer through a series of laboratory projects. 2 hrs. lecture, 3 hrs. open lab/wk.

ELEC 230 Electronic Devices II* (3 Hours)
Prerequisites: ELEC 130

This class is a continuation of the electronic devices sequence. Topics include operational amplifiers, thyristors and voltage regulators. Operational amplifier applications include comparators, summing amplifiers, integrators, differentiators and active filters. 2 hrs. lecture, 3 hrs. lab/wk.

ELEC 240 Electronic Communication Systems* (4 Hours)
Prerequisites or corequisites: ELEC 230

This course provides a study of electronic communication systems. Topics include the electromagnetic spectrum, decibels, noise, amplitude modulation, antennas, transmission lines and the global positioning satellite system. 3 hrs. lecture, 3 hrs. lab/wk.

ELEC 250 Microcomputer Maintenance* (3 Hours)
Prerequisites: ELEC 126

This course is a continuation of the study of personal computers and will further the student's ability to maintain and repair them. In addition, this course will assist the student in preparing for computer-maintenance certification. Topics will include interaction of hardware and operating systems, resource conflicts, networking capabilities, common hardware and software problems, hardware differences of portable computers, and upgrading computers. The course topics will be supported by laboratory projects. 2 hrs. lecture, 3 hrs. lab/wk.

ELEC 271 Electronics Internship I* (1-3 Hour)
Prerequisites: department approval

This course affords the student the opportunity to apply classroom knowledge to an actual work environment. It will provide selected advanced electronics technology students with appropriate on-the-job experience with area employers, under instructional oversight, that will promote the student's career goals. 18 hrs. approved and appropriate work activity/wk.

ELEC 291 Independent Study* (1-7 Hour)
Prerequisites: 2.0 GPA minimum and department approval

Independent study is a directed, structured learning experience offered as an extension of the regular curriculum. It is intended to allow individual students to broaden their comprehension of the principles of and competencies associated with the discipline or program. Its purpose is to supplement existing courses with individualized, in-depth learning experiences. Such learning experiences may be undertaken independent of the traditional classroom setting, but will be appropriately directed and supervised by regular instructional staff. Total contact hours vary based on the learning experience.