NORTH CAROLINA COMMUNITY COLLEGE SYSTEM

Dr. R. Scott Ralls, President

July 26, 2011

MEMORANDUM

TO: Presidents
Chief Academic Officers

FROM: Sharon E. Morrissey
Senior Vice President and Chief Academic Officer

SUBJECT: State Board Action on July 15, 2011
New, Revised, and Archived Curriculum Standards

On July 15, 2011, the State Board of Community Colleges approved the requested revisions to the following curriculum standard:

Biopharmaceutical Technology (A20180)

Please be aware that you must implement the revised standard no later than one year after the effective term. You must update your college's electronic program of study and receive approval from the System Office prior to implementation of the revised program.

The State Board of Community Colleges also approved new curriculum standards and courses for the following:

Aviation Electronics (Avionics) Technology (A60150)
Electric Utility Substation and Relay Technology (A50510)

In other action, the State Board of Community Colleges archived the attached list of curriculum standards. These programs are not currently approved at any college.

If you have any questions concerning the State Board action items, please contact Ms. Jennifer Frazelle at 919.807.7120 or frazellej@nccommunitycolleges.edu. The revised standard, new standards, and new curriculum courses are attached for your convenience. You may view all curriculum standards and courses by visiting the Programs website at:

http://www.nccommunitycolleges.edu/Programs/index.html

SEM/JF/gr
Attachments
c: Mr. Van Wilson
Ms. Elizabeth Self
Ms. Jennifer Frazelle
Program Coordinators

CC11-019
Email

Archived Curriculum Programs
(Archived by State Board of Community Colleges on July 15, 2011)

Program Code	Curriculum Program Title
Agricultural and Natural Resources Technologies	
A1528A	Applied Animal Science Technology/Poultry Management
A15180	Floriculture Technology
D15300	Lumber Specialist (Diploma)
C15340	Meat Processing (Certificate)
C15380	Saw Filer (Certificate)
D15400	Sawyer (Diploma)
A15440	Wood Products Technology
Business Technologies	
D25180	Desktop Publishing (Diploma)
A2527A	Information Systems Security/Operating Systems
A25300	Media Integration Technology
A25430	Support Technologies
Commercial and Artistic Production Technologies	
A30150	Community Journalism
A30260	Photofinishing Technology
Construction Technologies	
A35260	Industrial Construction Technology
A3526A	Industrial Construction Technology/Electrical
A3526B	Industrial Construction Technology/Mechanical
Engineering Technologies	
A40340	Materials Science Technology
A40360	Scientific Graphics Technology
Health Sciences	
D45710	Rehabilitation Assistant (Diploma)
Industrial Technologies	
A50110	Chemical Process Technology
A50280	Industrial Specialty Technology
A5032B	Manufacturing Technology/Quality Assurance
A50370	Poultry Processing Machine Technology
A5042A	Welding Technology/Underwater
Public Service Technologies	
A55340	Postal Service Technology
A55390	Spanish Interpreter
Transport Systems Technologies	
D60120	Automotive Parts Sales Representative (Diploma)

CURRICULUM STANDARD

Effective Term
Fall 2011
*[2011*03]*

Curriculum Program Title: **Aviation Electronics (Avionics) Technology** Code: **A60150**

Concentration: **(not applicable)**

Curriculum Description

This curriculum provides individuals with the basic knowledge and skills required to enter the avionics career field as a technician and prepares students for the current avionics licensing agency examination.

Course work includes general aviation maintenance, sheet metal, airframe systems, electrical and electronic systems, practical wiring, navigation equipment, flight management and flight control systems, flight line testing and troubleshooting, and Federal Aviation Administration (FAA) regulations.

Graduates should be prepared for the current avionics licensing agency examination and for entry-level employment as an avionics technician in an avionics repair station, an airfield fixed base operator's avionics facility, or an independent repair facility.

*Curriculum Requirements**

[for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204 (3)]

I. General Education. Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(See second page for additional information.)*

III. Other Required Hours. A college may include courses to meet graduation or local employer requirements in a certificate, diploma, or associate in applied science program. These curriculum courses shall be selected from the Combined Course Library and must be approved by the System Office prior to implementation. Restricted, unique, or free elective courses may not be included as other required hours.

	AAS	Diploma	Certificate
Minimum General Education Hours	15	6	0
Minimum Major Hours	49	30	12
Other Required Hours	0-7	0-4	0-1
Total Semester Hours Credit (SHC)	**64-76**	**36-48**	**12-18**

Major Hours

[ref. 23 NCAC 02E.0204 (3)]

A. Core. The subject/course core is comprised of subject areas and/or specific courses which are required for each curriculum program. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the subject/course core of the AAS program.

B. Concentration *(if applicable).* A concentration of study must include a minimum of 12 semester hours credit from required subjects and/or courses. The majority of the course credit hours are unique to the concentration. The required subjects and/or courses that make up the concentration of study are in addition to the required subject/course core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core or concentration. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

Aviation Electronics (Avionics) Technology (A60150)

	AAS	Diploma	Certificate
Minimum Major Hours Required	**49 SHC**	**30 SHC**	**12 SHC**
A. CORE **Required Courses:** AVI 110 Aviation Maintenance-General 15 SHC AET 120 Sheet Mtl Acft Structures 2 SHC AET 122 Airframe Electrical 4 SHC AET 126 Electronics/Instruments 2 SHC AET 210 Practical Wiring/Factors 2 SHC AET 212 Aviation Comm Systems 2 SHC AET 214 Avia Navigation Systems 2 SHC AET 220 Flight Management 2 SHC AET 222 Avia System Interconnect 2 SHC AET 224 Adv Wire/Troubleshooting 4 SHC AET 226 Flight Line Testing 2 SHC	**39 SHC**		
B. CONCENTRATION *(Not applicable)*			
C. OTHER MAJOR HOURS *To be selected from the following prefixes:* AET, AVI, CIS, COE, and CSC *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*			

Aviation Electronics (Avionics) Technology

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 120 Sheet Mtl Acft Structures 1 2 2
Prerequisites: AVI 110
Corequisites: None

This course covers the methods and materials used in the construction, design, and repair of aircraft metallic structures. Topics include approved methods, processes, and procedures used in inspection, repair, manufacture, and fabrication of sheet metal structures. Upon completion, students should be able to inspect, construct, and repair sheet metal structures.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 122 Airframe Electrical 2 4 4
Prerequisites: AVI 110
Corequisites: None

This course introduces the operation, installation, and repair of engine and airframe electrical components. Topics include wiring, controls, switches, protective devices, lighting systems, AC circuits, and related electrical accessories. Upon completion, students should be able to install or repair wiring, controls, circuit breakers, switches, electrical accessories, and interpret wire gauge charts.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 124 Airframe Systems 2 6 4
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the study of various systems on modern aircraft, including atmosphere control systems, pressurization, heating, cooling, and oxygen systems. Topics include various pneumatic and electrically operated ice and rain, pneumatic, and atmospheric systems. Upon completion, students should be able to identify, disassemble, inspect, and reassemble heating, air conditioning and pressurization systems.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 126 Electronics/Instruments 1 2 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the study of theory and application of electronic flight instruments and avionics systems as found in modern aircraft. Topics include the markings and operation of gyroscopic, temperature, direction, and pitot/static operated instruments systems. Upon completion, students should be able to perform pitot/static checks, bench test instruments and then perform tests on the entire system.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 130 Avia Engine Electrical 2 4 4
Prerequisites: AVI 110
Corequisites: None
This course introduces students to the study of engine electrical systems and instruments used on turbine-powered and reciprocating engine-powered aircraft. Topics emphasize mechanical power generating and engine starting systems, including hands-on experience with removal, installation, disassembly, troubleshooting, and adjustment of starting, regulating, and monitoring devices. Upon completion, students should be able to evaluate a complete aircraft engine electrical system using provided schematics and determine corrective actions when necessary.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 132 FAA Regulations 1 3 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the practical experience in the day-to-day operations of a Federal Aviation Administration Certified Repair Station. Topics include the completion of FAA forms and records, maintenance of technical data, and servicing equipment. Upon completion, students should be able to determine instances when FAA documentation is required and accurately document each case.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 210 Practical Wiring/Factors 1 3 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the concepts, practical application of aircraft wiring, and aviation system interconnection procedures. Topics include aircraft structural considerations, wiring harness construction, schematic design and reading, cockpit instrument panel design, and FAA regulatory considerations for electrical installations. Upon completion, students should be able to interpret schematics, and draw a GNS 430W pin-out including its interface with other related equipment.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 212 Aviation Comm Systems 1 3 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the concepts and practical maintenance of VHF and UHF communications, as well as inter-cabin communication. Topics include VHF and UHF communications, inter-cabin communication systems, the associated wiring, antennas, bench and ramp testing of components. Upon completion, students should be able to identify and explain communication wiring, components, schematics, and troubleshooting techniques for aviation communication systems.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 214 Avia Navigation Systems 1 3 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to navigational systems including VOR, ILS, ADF, antennas, and equipment testing. Topics include manufacturer's schematics for identifying wiring and components, manufacturer's assembly specifications, wiring, and calibrating a course deviation indicator using IFR 4000 test equipment. Upon completion, students should be able to identify the navigational wiring, explain its function, and solve faults associated with navigation systems.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 216 ATC Navigation Systems 1 3 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to flight line testing of air traffic control transponders, ADS-B, TIS, TAS, traffic avoidance systems, and ELT systems. Topics include IFR 4000 ELT, IFR 6000 testing of common aviation navigation system components and associated antennas, and satellite navigational systems. Upon completion of this course the student will be able to design an instrument panel, upload the design, and test it with IFR test equipment.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 218 Tactical Nav Systems 1 3 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to passive weather systems used on-board aircraft, weather radar, and radar altimeters with associated antennas. Topics include tactical navigation, passive weather detection, collision avoidance systems, and the roll of the FAA's reduced vertical separation minimums and terrain awareness systems**.** Upon completion, students should be able to identify weather radar, installation requirements, testing considerations and identify the requirements for collision avoidance.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 220 Flight Management 1 2 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the theoretical concepts and maintenance of autopilots, integrated flight control systems, and flight management systems. Topics include interaction with area navigation systems, including, land-based area navigation (VOR/DME R-NAV), GPS, and interfacing with autopilot. Upon completion, students should be able to create a flight plan and GPS approaches to determine the proficiency of an avionics system.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 222 Avia System Interconnect 1 2 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the study of databus communications in avionics systems, flight data recorders, and entertainments systems. Topics include databus architectures, protocols, industry standardized busses including RS, ARINC and AFDX (Ethernet), flight data recorders, entertainment, DVD, and moving maps. Upon completion, students should be able to explain the design and differences between digital and analog systems being utilized in modern avionics systems.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 224 Adv Wire/Troubleshooting 2 6 4
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the study of advanced electronics applied to aviation and the study of component level troubleshooting. Topics include wiring, programming, aligning, and troubleshooting a G900 or similar integrated avionics stack and similar navigation systems in a repair station environment. Upon completion, students should be able to interpret schematics, configure, and troubleshoot a G900 Integrated Avionics or similar package assembly.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 226 Flight Line Testing 1 2 2
Prerequisites: AVI 110
Corequisites: None

This course introduces students to the study of avionics systems found onboard modern aircraft focusing on flight line testing of communications and navigation systems. Topics include flight line testing to troubleshoot and configure using IFR 6000, IFR 4000 test equipment in conjunction with a pitot/static/ test set. Upon completion, students should be able to test with the IFR 4000 test set to complete certifications for an IFR aircraft.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

AET 228 Avionics FCC Preparation 1 2 2

Prerequisites: None
Corequisites: None

This course introduces students to the study of preparing for the Federal Communications Commission General Radio Telephone License examination. Topics covered include avionics circuits, troubleshooting techniques, aviation transmitters and receivers, antennas, Federal Communications Commission rules, and a review of test taking techniques. Upon completion, students should be prepared for the Federal Communications Commission General Radio Telephone License or similar examination.

CURRICULUM STANDARD

Effective Term
Fall 2011
*[2011*03]*

Curriculum Program Title **Biopharmaceutical Technology** Code **A20180**

Concentration **(not applicable)**

Curriculum Description

The Biopharmaceutical Technology curriculum is designed to prepare individuals for employment in pharmaceutical manufacturing and related industries. Major emphasis is placed on manufacturing processes and quality assurance procedures.

Course work includes general education, computer applications, biology, chemistry, industrial safety, and an extensive array of very detailed pharmaceutically specific classes.

Graduates should qualify for numerous positions within the industry. Employment opportunities include, but are not limited to, the following: Chemical Quality Assurance, Microbiological Quality Assurance, Product Inspection, Documentation Review, Manufacturing, and Product/Process Validation.

*Curriculum Requirements**

[for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204 (3)]

I. General Education. Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(See second page for additional information.)*

III. Other Required Hours. A college may include courses to meet graduation or local employer requirements in a certificate, diploma, or associate in applied science program. These curriculum courses shall be selected from the Combined Course Library and must be approved by the System Office prior to implementation. Restricted, unique, or free elective courses may not be included as other required hours.

	AAS	**Diploma**	**Certificate**
Minimum General Education Hours	15	6	0
Minimum Major Hours	49	30	12
Other Required Hours	0-7	0-4	0-1
Total Semester Hours Credit (SHC)	**64-76**	**36-48**	**12-18**

Major Hours

[ref. 23 NCAC 02E.0204 (3)]

A. Core. The subject/course core is comprised of subject areas and/or specific courses which are required for each curriculum program. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the subject/course core of the AAS program.

B. Concentration *(if applicable).* A concentration of study must include a minimum of 12 semester hours credit from required subjects and/or courses. The majority of the course credit hours are unique to the concentration. The required subjects and/or courses that make up the concentration of study are in addition to the required subject/course core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core or concentration. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

Biopharmaceutical Technology A20180

		AAS	Diploma	Certificate
Minimum Major Hours Required		**49 SHC**	**30 SHC**	**12 SHC**
A. CORE *Courses required for the diploma are designated with ** **Required Courses:** * CHM 131 Introduction to Chemistry * CHM 131A Introduction to Chemistry Lab * CHM 132 Organic and Biochemistry * PTC 110 Industrial Environment * PTC 120 Pharmaceutical Quality Control BPM 110 Bioprocess Practices **Required Subject Areas:** ***Biology. Select one:** BIO 110 Principles of Biology BIO 111 General Biology I	3 SHC 1 SHC 4 SHC 3 SHC 4 SHC 5 SHC 4 SHC 4 SHC	**24 SHC**	**19 SHC**	
B. CONCENTRATION *(Not applicable)*				
C. OTHER MAJOR HOURS *To be selected from the following prefixes:* BIO, BPM, CHM, CIS, COE, CSC, ENV, ISC, and PTC *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*				

CURRICULUM STANDARD

Effective Term
Fall 2011
*[2011*03]*

Curriculum Program Title **Electric Utility Substation and Relay Technology** Code **A50510**

Concentration **(not applicable)**

Curriculum Description

The Electric Utility Substation and Relay Technology curriculum provides the skills to maintain high voltage equipment and protective systems for the electric utility transmission system. Training in operation and maintenance of critical infrastructure associated with the transmission grid is included.

Courses are designed to develop student understanding of maintenance and troubleshooting on transmission equipment, including three phase power theory, protective relaying, power transformers, voltage regulators, capacitors, and power circuit breakers common to electric utility and numerous other industries.

Graduates should qualify for entry-level employment in electric utility, renewable energy, and industrial facilities as technicians who diagnose and service equipment and components used for electrical power transmission.

*Curriculum Requirements**

[for associate degree, diploma, and certificate programs in accordance with 23 NCAC 02E.0204 (3)]

I. General Education. Degree programs must contain a minimum of 15 semester hours including at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural sciences/mathematics. Degree programs must contain a minimum of 6 semester hours of communications. Diploma programs must contain a minimum of 6 semester hours of general education; 3 semester hours must be in communications. General education is optional in certificate programs.

II. Major Hours. AAS, diploma, and certificate programs must include courses which offer specific job knowledge and skills. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit. *(See second page for additional information.)*

III. Other Required Hours. A college may include courses to meet graduation or local employer requirements in a certificate, diploma, or associate in applied science program. These curriculum courses shall be selected from the Combined Course Library and must be approved by the System Office prior to implementation. Restricted, unique, or free elective courses may not be included as other required hours.

	AAS	**Diploma**	**Certificate**
Minimum General Education Hours	15	6	0
Minimum Major Hours	49	30	12
Other Required Hours	0-7	0-4	0-1
Total Semester Hours Credit (SHC)	**64-76**	**36-48**	**12-18**

Major Hours

[ref. 23 NCAC 02E.0204 (3)]

A. Core. The subject/course core is comprised of subject areas and/or specific courses which are required for each curriculum program. A diploma program offered under an approved AAS program standard or a certificate which is the highest credential level awarded under an approved AAS program standard must include a minimum of 12 semester hours credit derived from the subject/course core of the AAS program.

B. Concentration *(if applicable).* A concentration of study must include a minimum of 12 semester hours credit from required subjects and/or courses. The majority of the course credit hours are unique to the concentration. The required subjects and/or courses that make up the concentration of study are in addition to the required subject/course core.

C. Other Major Hours. Other major hours must be selected from prefixes listed on the curriculum standard. A maximum of 9 semester hours of credit may be selected from any prefix listed, with the exception of prefixes listed in the core or concentration. Work experience, including cooperative education, practicums, and internships, may be included in associate in applied science degrees up to a maximum of 8 semester hours of credit; in diploma programs up to a maximum of 4 semester hours of credit; and in certificate programs up to a maximum of 2 semester hours of credit.

Electric Utility Substation and Relay Technology A50510

	AAS	Diploma	Certificate
Minimum Major Hours Required	**49 SHC**	**30 SHC**	**12 SHC**
A. CORE **Required Courses:** CIS 110 Introduction to Computers 3 SHC EUS 110 Intro to Elect Util Ind 4 SHC EUS 120 Elect Util Sys Ov & Oper 3 SHC EUS 130 Elect Util Print Reading 2 SHC EUS 210 Lg High Volt Power Trans 3 SHC EUS 220 High Volt Power Cir Br 3 SHC EUS 230 Elect Util Prot Rel 3 SHC EUS 240 Substation Ancillary Sys 3 SHC EUS 250 Metering Technology 3 SHC EUS 260 Cap & Case Stu in EUSRT 2 SHC	**29 SHC**		
B. CONCENTRATION *(Not applicable)*			
C. OTHER MAJOR HOURS *To be selected from the following prefixes:* BPR, CIS, COE, DFT, ELC, ELN, EUS, ISC, MAT, and PHY *Foreign language courses (including ASL) that are not designated as approved other major hours may be included in all programs up to a maximum of 3 semester hours of credit.*			

Electric Utility Substation and Relay Technology

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 110	**Intro to Elect Util Ind**	3	3	4
Prerequisites:	None			
Corequisites:	None			

This course provides the student with an overview of the electric (power) utility industry. Topics include electric utility regulation and its scope, regulatory agencies and codes, electrical safety, electric system overview, electric generation, electric transmission, and electric distribution. Upon completion, students should be able to understand the need for electric utilities, their structure, and regulatory requirements on electric utilities.

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EUS 120	**Elect Util Sys Ov & Oper**	2	2	3
Prerequisites:	EUS 110			
Corequisites:	None			

This course introduces the basic design, development, and operation of the electrical power grid in North America. Topics include types of generation, transmission voltages, interconnection of utility systems, scheduling generation to meet demand, maintaining adequate voltages, and reliability. Upon completion, students should be able to understand how electricity is generated, transmitted, and delivered reliably to all customers.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 130	**Elect Util Print Reading**	1	2	2
Prerequisites:	EUS 110			
Corequisites:	None			

This course introduces the basic principles of reading electrical drawings used in the utility industry. Topics include functional diagrams, AC and DC control schematics, wiring diagrams, control wiring diagrams, and logic diagrams. Upon completion, the student should be able to explain the purpose and function of the various circuits and components in each type of electrical drawing.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 210	**Lg High Volt Power Trans**	2	3	3
Prerequisites:	EUS 120 and EUS 130			
Corequisites:	None			

This course introduces the fundamentals of large power transformers used in the electrical utility industry with emphasis on function and criticality. Topics include understanding the various designs, load calculations, dissolved gas analysis, assembly, commissioning tests, available accessories, bushings, maintenance, and trouble shooting. Upon completion, students should be able to identify the various winding configurations and connections, interpret nameplate information, and perform various tests on transformers.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 220	**High Volt Power Cir Br**	2	3	3
Prerequisites:	EUS 120 and EUS 130			
Corequisites:	None			

This course introduces the fundamentals of high voltage power circuit breakers used in the electrical utility industry with emphasis on function and criticality. Topics include understanding the various designs and interrupting mediums, how circuit breakers interrupt fault currents, Sulfur Hexafluoride gas (SF6), breaker timing, and maintenance. Upon completion, students should be able to identify various types of circuit breakers, interpret nameplate information, and perform various tests on these devices.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 230	**Elect Util Prot Rel**	2	3	3
Prerequisites:	EUS 210 and EUS 220			
Corequisites:	None			

This course introduces protective relaying used in the electrical utility industry with emphasis on function and criticality. Topics include substations zones protection, transmission lines, switchyards, relays, and power line carrier components. Upon completion, students should be able to understand the purpose for various relay schemes and protective relays.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 240	**Substation Ancillary Sys**	2	3	3
Prerequisites:	EUS 210 and EUS 220			
Corequisites:	None			

This course introduces many of the supporting systems used in substations and generating plant switchyards to support the operation of the electric power grid. Topics include instrument transformers, capacitor banks, reactor banks, batteries, circuit switchers, bushings, disconnect switches, and ground grids. Upon completion, the student should be able to understand the design and purpose of each of these devices and systems.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 250	**Metering Technology**	2	3	3
Prerequisites:	EUS 210 and EUS 220			
Corequisites:	None			

This course covers single and three-phase metering principles, meter construction, component parts, and the installation and testing of single and three-phase meters. Topics include instrument transformer theory and applications, sizing instrument transformers, wiring transformers, meter installations, and electronic meter functionality. Upon completion, students should be able to install and test single and three-phase meters.

Effective Term –Fall 2011 [2011*03] – SBCC 7/15/11

EUS 260	**Cap & Case Stu in EUSRT**	2	0	2
Prerequisites:	EUS 210 and EUS 220			
Corequisites:	None			

This course provides an opportunity for students to utilize all facets of their educational experience to solve problems common to the electric utility industry. Topics include electric utility and industry case studies, project safety, planning and organization, communication, and project documentation. Upon completion, students should be able to demonstrate the ability to complete a capstone project, concluding with a formal report.