PROGRAMS AND CERTIFICATES
R=Riverside; M=Moreno Valley; N=Norco

ACCOUNTING

See BUSINESS ADMINISTRATION

ADMINISTRATION OF JUSTICE

The following certificate may lead to employment competency, but does not lead to an Associate of Science Degree:

CRIME SCENE INVESTIGATION (NR) NCE619

This certificate is designed to offer a basic pattern of coursework that will prepare the participant to enter the professional field of crime scene investigation and forensic science at the assistant level. The successful participant will gain sufficient skills and understanding of the criminal investigative procedure to assist professional Forensic Identification Technicians, within the criminal justice system, to properly gather, analyze, prepare, and present crime scene evidence.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate an advanced knowledge of the principle components of criminal law and the criminal justice system.
- Demonstrate an advanced knowledge of the procedures and process of collecting, preserving, and cataloging physical evidence from a crime scene.
- Demonstrate an advanced ability to use computer technology to report the collection, preservation, and presentation of crime scene evidence.

Required Courses (15 units)		Units
ADJ-2	Principles and Procedures of the Justice System	3
ADJ-3	Concepts of Criminal Law	3
ADJ-13	Criminal Investigation	3
ADJ-14	Advanced Criminal Investigation	3
ANT-10	Forensic Anthropology	3

ARCHITECTURE

The following certificate may lead to employment competency, but does not lead to an Associate of Science Degree:

ARCHITECTURAL GRAPHICS (N) NCE787

The Architectural Graphics certificate prepares students with technical communication skills, and the knowledge and craft of two dimensional drafting solutions for architecturally related industry applications. Students learn to present graphic solutions, provide design refinements, modifications, and delineations of working technical drawings using current Computer-Aided Drafting CAD methods and techniques with an understanding of industry standards. Certificate completers are able to secure drafting technician positions in areas related to architecture, environmental design, and to assist in the development of architectural construction documents for light frame structures, under the supervision of a professional.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Complete a set of residential working drawings, which may include first floor drawings, second floor drawings, foundation drawings, elevations, cross-sections, framing, electrical drawings, and structural detail.
- Demonstrate an ability to apply and integrate computer technology into the design process to achieve a desired result.

Required Courses (9 units)		Units
ARE-24	Architectural Drafting	3
ENE-21	Drafting	3
ENE-30	Computer-Aided Drafting (CAD)	3

AUDIO PRODUCTION

See MUSIC INDUSTRY STUDIES

BUSINESS ADMINISTRATION

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Use technology to analyze business decisions and to enhance business communications.
- Apply basic business and accounting calculations and analyses.
- Have an understanding of legal practices relating to business.
- Apply sound management practices.

Major Core Requirements:

Required Courses (18 units)		Units
ACC-1A	Principles of Accounting I	3
BUS-10	Introduction to Business	3
BUS-18A	Business Law I	3
BUS-20	Business Mathematics	3
BUS-22	Management Communications	3
or BUS-24	Business Communication	3
CIS-1A	Introduction to Computer Information Systems	3
or		
BUS/CIS/ CAT-3	Computer Applications for Business	3

Major Concentration Requirements (12 units)

(In addition to Business Administration Major Core Requirements of 18 units noted above choose another 12 units selected from list below.)

Accounting	12
General Business	12
Logistics Management	12
Management	12
Real Estate	12

NOTE: Students must complete all Business Administration Major Core Requirements and must complete Major Concentration Requirements (total of 30 units) in order to receive the certificate in the concentration area of their choice.

Associate of Science Degree

The Associate of Science Degree in Business Administration with a Major Concentration will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

ACCOUNTING CONCENTRATION (MNR)

NAS523/NAS523B/NAS523C/NCE523

This program prepares individuals to practice the profession of accounting and to perform related business functions. This includes instruction in accounting principles and theory, financial accounting, managerial accounting, cost accounting, budget control, tax accounting, legal aspects of accounting, reporting procedures, statement analysis, planning and consulting, business information systems, accounting research methods, professional standards and ethics, and applications to specific for-profit, public, and non-profit organizations.

Program Learning Outcomes

In addition to outcomes for the Businesses Administration certificate, on successful completion of the Accounting concentration, students should be able to accomplish at least three of the following eight tasks:

- Apply accounting principles related to a variety of accounting specialties, such as payroll accounting, cost accounting, income tax accounting, and computerized accounting.
- Analyze and solve accounting issues and problems for a variety of business entities.
- Analyze and interpret data and reports for a variety of business entities.
- Develop and apply principles of moral judgment and ethical behavior to business situations.

Business Administration Major Core Requirements 18

Required for this concentration		3
ACC-1B	Principles of Accounting II	3
and		
Select another 9 units from the following:		9
ACC-61	Cost Accounting	3
ACC-62	Payroll Accounting	3
ACC-63	Income Tax Accounting	3
ACC-65	Computerized Accounting	3
ACC-66	Non-Profit and Governmental Accounting	3
ACC-200	Accounting Work Experience	1-2-3-4
BUS/ MAG-47	Applied Business and Management Ethics	3

BUSINESS INFORMATION WORKER (NR)

NCE522/NAS522

The Business Information Worker Certificate of Achievement is designed to prepare students for entry-level and administrative support in a variety of fields and businesses.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate computer literacy with respect to computer hardware and software applications.
- Apply standard rules of business conduct and customer service.
- Develop specialized keyboarding skills at an employable level of accuracy and speed.
- Use word processing, spreadsheet, presentation graphics, and scheduling software to perform business and office tasks.
- Apply oral and written communication skills in various business and office environments.
- Design, modify, query, and manipulate lists (database and information in workbooks) using common formulas, data and what if scenario tools to organize and convey information.

Required Courses (19 units)		Units
CAT-1A	Business Etiquette	1
CAT/CIS/BUS-3	Computer Applications for Business	3
CAT-31	Business Communications	3
CAT-51	Intermediate Typewriting/Document Formatting	3
CAT/CIS-90	Microsoft Outlook	3
CAT 93	Computers for Beginners	3
CAT/CIS-98A	Introduction to Excel	1.5
CAT/CIS-98B	Advanced Excel	1.5

Associate in Science Degree

The Associate in Science Degree in Business Information Worker will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

GENERAL BUSINESS CONCENTRATION (MNR)

NAS524/NAS524B/NAS524C/NCE524

This program focuses on the general study of business, including domestic, international and electronic, and the important ways in which business impacts our daily lives. The program will prepare individuals to apply business principles and techniques in various career settings and to gain an understanding of business situations that affect their personal and working lives. This includes the buying, selling and production of goods and services, understanding business organizations, general management, and employee motivation strategies, basic accounting principles, the economy, and marketing.

Program Learning Outcomes
In addition to outcomes for the Businesses Administration certificate, on successful completion of the General Business concentration, students should be able to accomplish four of the following seven tasks:

- Explain the managerial applications of accounting reports and ratios to the business enterprise.
- Analyze the law as it pertains to business organizations and to determine the legal management of the various forms of law.
- Analyze the business elements that comprise the logistics function.
- Develop and apply principles of moral judgment and ethical behavior to business situations.
- Anticipate and pose problems relative to understanding and supervising personnel.
- Identify and analyze human relations techniques appropriate to a managerial role.
- Explain and develop the marketing mix, including an analysis of the marketing mix variables—product, place, price, and promotion.

Business Administration Major Core Requirements		**18**
Select another 12 units from the following:		12
ACC-1B	Principles of Accounting II	3
or		
ACC-38	Managerial Accounting	3
BUS-18B	Business Law II	3
BUS-40	International Business-Principles	3
BUS/MAG-47	Applied Business and Management Ethics	3
BUS-80	Principles of Logistics	3
BUS-200	Business Administration Work Experience	1-2-3-4
MAG-51	Elements of Supervision	3
MAG-53	Human Relations	3
MKT-20	Principles of Marketing	3

LOGISTICS MANAGEMENT CONCENTRATION (N)
NAS580/NAS580B/NAS580C/NCE580
This program prepares students for entry into or career growth within the logistics industry, and ongoing study of the field. The focus is on integrated logistics, a necessity for management of effective and efficient supply chains. Logistics disciplines covered include warehousing, transportation, service contracting, purchasing, global logistics, etc

Program Learning Outcomes
In addition to outcomes from the core Business Administration courses, and upon successful completion of the Logistics concentration, students should be able to do four to five of the following eight things:

- Compare roles and objectives of the logistics disciplines
- Understand how logistics functions can interact to efficiently use total personnel, facilities and equipment.
- Contribute knowledge needed by multidisciplinary teams to effectively integrate and exceed end user (customer) expectations
- Analyze, prepare, file and process claims when unavoidable freight disputes arise
- Explain how the overall flow of goods, services and information can be optimized to satisfy customer and business goals
- Identify 3rd party logistics provider and client needs in negotiations, bidding and contracts, as well as legal and regulatory constraints to integrated logistics
- Describe roles and value added by global logistics intermediaries

Business Administration Major Core Requirements		18
Required for this concentration		3
BUS-80	Principles of Logistics	3
and		
Select another 9 units from the following:		9
BUS-82	Freight Claims	1.5
BUS-83	Contracts	1.5
BUS-85	Warehouse Management	3
BUS-86	Transportation and Traffic Management	3
BUS-87	Purchasing and Supply Management	3
BUS-90	International Logistics	3

Note: Students may petition to have elective credit applied toward this Certificate Concentration for military training, extra-institutional learning, and transfer or articulated courses in logistics disciplines. Students must complete at least 9 units at Norco College from the above list 12 unit Concentration for such credit to apply.

Associate in Science Degree
The Associate in Science Degree in Logistics Management will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

MANAGEMENT CONCENTRATION (MNR)
NAS521/NAS521B/NAS521C/NCE521
This program generally prepares individuals to plan, organize, direct, and control the functions and processes of a firm or organization with an emphasis on people as the most important asset of a business. This program will prepare individuals seeking management positions to be better candidates for promotion, and those already in management positions to improve their management skills and effectiveness. This includes instruction in management practice and theory, human resources management and behavior, interpersonal communications in a business setting, marketing management, and business decision making.

Program Learning Outcomes
In addition to outcomes for the Businesses Administration certificate, on successful completion of the Management concentration, students should be able to:

- Apply sound management practices.
- Analyze and apply appropriate managerial practices in one or more areas of ethics, human resources, quality management, operations, motivation, etc.

Business Administration Major Core Requirements 18

Required for this concentration		3
MAG-44	Principles of Management	3
and		
Select another 9 units from the following:		9
MAG-46	Contemporary Quality Systems Management	3
MAG/ BUS-47	Applied Business and Management Ethics	3
MAG-53	Human Relations	3
MAG-56	Human Resources Management	3
MAG-60	Introduction to Hospitality Management	3
MAG-200	Management Work Experience	1-2-3-4
BUS-48	International Management	3

REAL ESTATE CONCENTRATION (MNR)
NAS527/NAS527B/NAS527C/NCE527

This program prepares individuals to develop, buy, sell, appraise, and manage real property. This includes instruction in land use development policy, real estate law, real estate marketing procedures, agency management, brokerage, property inspection and appraisal, real estate investing, leased and rental properties, commercial real estate, and property management.

Program Learning Outcomes

In addition to outcomes for the Businesses Administration certificate, on successful completion of the Real Estate concentration, the student should be able to do the following:

- Demonstrate the ability to analyze ethical and procedural problems that arise in residential real estate sales transactions from the prospective of buyers, sellers, brokers, appraisers, lenders, and escrow officers.
- Discuss and evaluate real estate marketing and sales techniques.
- Discuss and calculate real estate taxes and solve basic real estate mathematics problems.
- Explain and evaluate methods of financing real estate purchases and securing loans with real estate.
- Demonstrate the ability to analyze the factors that affect real estate values.
- Discuss and evaluate real estate markets and trends.

Business Administration Major Core Requirements 18

Select another 12 units from the following:		12
RLE-80	Real Estate Principles	3
RLE-81	Real Estate Practices	3
RLE-82	Legal Aspects of Real Estate	3
RLE-83	Real Estate Finance	3
RLE-84	Real Estate Appraisal	3
RLE-85	Real Estate Economics	3
RLE-86	Escrow Procedures I	3
RLE-200	Real Estate Work Experience	1-2-3-4

The following certificates may lead to employment competency, but do not lead to an Associate of Science Degree:

ENTREPRENEURSHIP: GETTING STARTED (N) NCE861

This certificate includes courses intended to help students who are interested in pursuing entrepreneurship to develop new ideas, recognize and take advantage of opportunities, as a foundation for creating a new business.

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of the entrepreneurial process, from idea generation to commercialization.
- Analyze and evaluate potential business ideas for marketability and success.
- Create and evaluate a comprehensive business plan.
- Outline and construct steps needed to create an effective social marketing campaign for a small business.

Required Courses (10 units)		Units
BUS-12	Opportunity Analysis for Entrepreneurs	2
BUS-13	Developing a Successful Business Plan/Models	2
BUS-14	Social Media and Electronic Marketing for Entrepreneurs	3
BUS-30	Entrepreneurship and Small Business Management	3

ENTREPRENEURSHIP: LEGAL AND FINANCE (N)
NCE864

This certificate includes courses intended to help students who are interested in pursuing entrepreneurship to develop skills in financing, legal issues, and applied accounting and bookkeeping for the small business.

Certificate Program
Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of the entrepreneurial process, from idea generation to commercialization.
- Demonstrate the ability to apply accounting and bookkeeping for small business principles to a potential business.
- Analyze and evaluate various funding sources for small businesses.
- Outline and evaluate the legal steps and issues necessary for opening a small business.

Required Courses (10 units)		Units
ACC-55	Applied Accounting/Bookkeeping	3
BUS-30	Entrepreneurship and Small Business Management	3
BUS-31	Financing Your Business	2
BUS-33	Business Structure and Legal Issues	2

REAL ESTATE SALESPERSON AND TRANSACTION (N)
NCE854

This program prepares students to buy, sell and lease, and to represent others to buy, sell and lease residential and commercial real estate property. Prepares students to qualify for the California Real Estate Salesperson license and to successfully take the

California Real Estate Salesperson exam. Instruction includes analysis of ethical and procedural real estate problems/types of real estate property ownership and leases; sales contracts and associated documents; required disclosures; land use policy; real estate marketing; real estate financing; and state and federal statutes, regulations and court cases affecting California real estate sales and leases.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate the ability to analyze ethical and procedural problems that arise in real estate transactions.
- Discuss and evaluate real estate marketing and sales techniques.
- Explain and evaluate methods of financing and evaluating real estate.
- Demonstrate the ability to analyze state and federal statutes, regulations, and court cases affecting real estate sales.

Required Courses (9 units)		Units
RLE-80	Real Estate Principles	3
RLE-81	Real Estate Practices	3

Select 3 units from the following:

ACC-1A	Principles of Accounting I	3
BUS-18A	Business Law I	3
RLE-82	Legal Aspects of Real Estate	3
RLE-83	Real Estate Finance	3
RLE-85	Real Estate Economics	3

REGISTERED INDIVIDUAL AND SMALL BUSINESS INCOME TAX PREPARER (N) NCE858
U.S. and California income tax principles and tax return preparation as it relates to individuals, sole proprietorships, and other business entities. This course is certified by the California Tax Education Council (CTEC) as fulfilling the 60-hour qualifying education requirement imposed by the State of California for becoming a Registered Tax Preparer.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Prepared federal and state income tax returns for individuals, sole proprietorships, and other business entities.
- Conduct tax research on client issues using both manual and computerized methods.
- Evaluate and propose strategies that minimize income tax obligations.

Required Courses (4 units)		Units
ACC-67	U.S. and California Income Tax Preparation	4

SMALL BUSINESS ACCOUNTING (MNR) NCE859
Upon completion of this certificate, students will be trained and able to perform the basic duties and responsibilities required of an entry level accounting clerk or bookkeeper utilizing accounting software.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Perform a variety of accounting skills such as journalizing, posting, double entry accounting, record adjusting and closing entries and prepare financial statements.
- Use accounting software to prepare financial statements and to analyze and solve problems.
- Recognize the role of ethics in accounting.

Required Courses (6 units)		Units
ACC-65	Computerized Accounting	3

and one of the following:

ACC-1A	Principles of Accounting	3
ACC/CAT-55	Applied Accounting/Bookkeeping	3

SMALL BUSINESS PAYROLL ACCOUNTING (MNR) NCE860
Upon completion of this certificate, students will be trained and able to perform the basic duties and responsibilities required of an entry level payroll accounting clerk.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Analyze, synthesize, and evaluate payroll principles as defined by Social Security Act and understand laws relating to the payment of wages and salaries.
- Analyze and solve problems associated with the calculation and reporting of payroll.
- Accurately apply accounting principles to computerized and manual payroll systems.

Required Courses (6 units)		Units
ACC-62	Payroll Accounting	3

and one of the following:

ACC-1A	Principles of Accounting	3
ACC/CAT-55	Applied Accounting/Bookkeeping	3

BIOLOGY

CALIFORNIA NATURALIST CERTIFICATE NCE894
The California Naturalist Certificate is an introduction to California's unique ecology and stewardship of California's natural communities with certification from the UC ANR California Naturalist program and training in Project Learning Tree. The UC ANR California Naturalist program uses a science curriculum, hands-on learning, problem-solving, citizen science, and community service to encourage engagement with nature and conservation of local resources.

Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Integrate knowledge about the interconnectedness of abiotic, biotic and cultural factors and their influence on the natural history of California. • Develop and implement a naturalist project, which may include nature interpretation for public presentation, collaboration with community organizations, collaborative conservation, and/or citizen science.

Required Courses (3 Units)		Units
BIO-21	California Naturalist	3

Total Units: 3

COMPUTER INFORMATION SYSTEMS

This program focuses on computers, computing problems and solutions, and design of computers systems and user interfaces from a scientific perspective. This includes instruction in their principles of computation science, and computing theory; computer hardware design; computer development and programming; and application to a variety of end-use situations.

COMPUTER PROGRAMMING (MNR)

NAS728/NAS728B/NAS728C/NCE728

This program focuses on the general writing and implementation of generic and customized programs to drive operating systems that generally prepare individuals to apply the methods and procedures of software design and programming to software installation and maintenance. This includes instruction in software design; low and high level languages and program writing; program customization and linking; prototype testing; troubleshooting; and related aspects of operating systems and networks.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Design structured programs using C++, Javascript, or Java.
- Design and use object oriented programs in one of these languages C++, Java or PHP.
- Design and use advanced programming techniques in C++ or Java.

Required Courses (26.5 units)		Units
CIS-1A	Introduction to Computer Information Systems	3
CIS/CSC-2	Fundamentals of Systems Analysis	3
CIS/CSC-5	Programming Concepts and Methodology I: C++	4
CIS-21	Introduction to Operating Systems	3
CIS-72A	Introduction to Web Page Creation	1.5
Electives	From Group 1	6
Electives	From Group 2	6

Electives - Group 1 (6 units)		
CIS/CSC-12	PHP Dynamic Web Site Programming	3
CIS/CSC-14A	Web Programming: JavaScript	3
CIS-14B	Web Programming: Active Server Pages	3
CIS/CSC-17A	Programming Concepts and Methodology II: C++	3
CIS/CSC-18A	Java Programming: Objects	3

Electives - Group 2 (6 units)		
CIS/CSC-11	Computer Architecture and Organization: Assembly	3
CIS-17B	C++ Programming: Advanced Objects	3
CIS-17C	C++ Programming: Data Structures	3
CIS-18B	Java Programming: Advanced Objects	3
CIS-18C	Java Programming: Data Structures	3

Associate of Science Degree
The Associate of Science Degree in Computer Programming will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

GRAPHIC DESIGN (N)

NAS647/NAS647B/NAS647C/NCE647

This program is designed for students who wish to pursue training in desktop publishing. Training will focus on using a computer to design page layouts, develop presentations, and create advertising campaigns. Students will learn to design, integrate, and format all forms of digital images into printable media.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Design and create images used for printed media in advertising web design.
- Understand and apply the techniques used to create and modify artwork using a vector-based program or bit-mapped program.
- Integrate text and graphics in a document layout program to create professional-quality, full-color documents.
- Format and combine text, numerical data, photographs, charts, and other visual graphic elements to produce publication- ready material.
- Demonstrate the knowledge of workflow process in the creation of printed media in advertising.
- Demonstrate the knowledge of design principles in advertising and layout design, type, and lettering applications.
- Incorporate two dimensional design visual media of printed media in advertising.

Required Courses (26 units)		Units
CIS-66	Web Development I	3
or		
CIS-72A	Introduction to Web Page Production	1.5
and		
CIS-72B	Intermediate Web Page Creation Using Cascading Style Sheets (CSS)	1.5

CIS/CAT-78A	Introduction to Adobe Photoshop	3
CIS-78B	Advanced Adobe Photoshop	3
CIS/CAT-79	Introduction to Adobe Illustrator	3
CIS-81	Introduction Adobe InDesign	3
CIS-59/ ADM-62	Typography and Graphic Design	3
ART-22	Basic Design	3
ART-39	Design and Graphics	3
GAM/CIS-44	Portfolio Production	2

Associate of Science Degree
The Associate of Science Degree in Graphic Design will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

C++ PROGRAMMING (NR) NCE803
Create structured and Object code in C++ for business, gaming, mathematical and scientific problems by identifying the information input requirements, synthesizing the algorithmic steps needed to transform the data input into the required output information, and organizing the output format to facilitate user communication.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Create structured and Object code in C++ for business, gaming, mathematical and scientific problems by identifying the information input requirements, synthesizing the algorithmic steps needed to transform the data input into the required output information, and organizing the output format to facilitate user communication.
- Using C++ libraries create and run C++ programs that incorporate the following:
  - Multiprocessors
  - Multimedia
  - ODBC
  - SQL
  - Establish client/server relationship
- OR Using C++ libraries create and run C++ programs that incorporate data structures.

Required Courses (13 units)		Units
CIS/CSC-5	Programming Concepts and Methodology I: C++	4
CIS/CSC-17A	Programming Concepts and Methodology II: C++	3
CIS -17B	C++ Programming: Advanced Objects	3
CIS -17C	C++ Programming: Data Structures	3

FULL STACK WEB DEVELOPMENT NCE889
The Full Stack Web Development Certificate of Proficiency is designed to prepare students for employment as a Full Stack Web Developer in nine weeks.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Use fundamental web-media languages/software tools to construct both static and dynamic web pages and to authenticate users and interface with a database.
- Use web development tools to expand the functionality of websites and web apps and to shorten the project development time.
- Develop a personally-selected web-app and develop a description of its functionality in oral and written communication.

Required Course (8 units)		Units
CIS-77	Full Stack Web Development	8

Total Units: 8

JAVA PROGRAMMING (NR) NCE809
Completion of this certificate provides the student with skills a new programmer would need to obtain employment programming Java applications.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Create structured and Object code in Java for business, gaming, mathematical and scientific problems by identifying the information input requirements, synthesizing the algorithmic steps needed to transform the data input into the required output information, and organizing the output format to facilitate user communication.
- Using Java libraries create and run Java programs that incorporate the following:
  - Multiprocessors
  - Multimedia
  - JDBC
  - SQL
  - Establish client/server relationship.
- Using Java libraries create and run Java programs that incorporate data structures.

Required Courses (13 units)		Units
CIS/CSC-5	Programming Concepts and Methodology I: C++	4
CIS/CSC-18A	Java Programming: Objects	3
CIS-18B	Java Programming: Advanced Objects	3
CIS-18C	Java Programming: Data Structures	3

CONSTRUCTION TECHNOLOGY

This program prepares individuals with the technical knowledge and skills in the area of building construction. This includes instruction enabling students to better understand and interpret construction codes, as well as clarifying processes and materials used in construction; and the basic physical laws which are used to formulate the prescriptive code regulations. Management and inspection skills are also examined.

CONSTRUCTION TECHNOLOGY (N)
NAS532/NAS532B/NAS532C/NCE532
Certificate Program
Program Learning Outcomes
Graduates will be able to identify and describe the materials and methods currently being employed in today's construction industry. Graduates will be able to interpret the major construction codes currently adopted by the state, county, and city which regulate construction installations. Graduates will be able to evaluate the basic concepts of engineering and soil design as they relate to structures.

Program Learning Outcomes
In addition to achieving the program learning outcomes for the construction technology certificate program, students who complete the Associate of Science Degree in Construction Technology will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

Required Courses (30 units)		Units
CON-63A	Uniform Building Codes and Ordinances	3
CON-64	Office Procedure and Field Inspection	3
CON-65	Plumbing Code	3
CON-66	National Electrical Code	3
CON-67	Mechanical Codes	3
CON-68	Simplified Engineering for Building Inspectors	3
CON-70	Fundamentals of Soil Technology	3
CON-71	Energy Conservation Standards	1.5
CON-72	California State Accessibility Standards	1.5
Electives	(Choose from list below)	6

Electives (6 units)		
CON-60	Introduction to Construction	3
CON-61	Materials of Construction	3
CON-62	Blueprint Reading	3
CON-63BCD	Analysis of Revisions to the Uniform Building Code	3-3-3
CON-73	Project Planning for Site Construction	3
CON-200	Construction Work Experience	1-2-3-4

Associate of Science Degree
The Associate of Science Degree in Construction Technology will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

DRAFTING TECHNOLOGY

This program prepares individuals to apply technical skills and advanced computer software and hardware to the creation of graphic representations and simulation in support of drafting and engineering design problems typical of industry. This includes instruction in engineering graphics, computer-aided drafting (CAD), two-dimensional and three-dimensional engineering design, solids modeling, rapid prototyping and engineering animation. Students completing this certificate will be qualified for an entry level drafting or mechanical design position.

DRAFTING TECHNOLOGY (N)
NAS539/NAS539B/NAS539C/NCE539
Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to demonstrate:

- An ability to apply and integrate computer technology in the design process, exhibiting skills necessary for entry-level employment, as a designer in the drafting industry.
- Knowledge of engineering drawing skills and practice in the solution of industry related design projects.

Program Learning Outcomes
In addition to achieving the program learning outcomes for the drafting technology certificate program, students who complete the Associate of Science Degree in Drafting Technology will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

Required Courses (25-27 units)		Units
DFT/ENE-21	Drafting	3
DFT/ENE-22	Engineering Drawing	3
DFT/ENE-28	Technical Design	3
DFT/ENE-30	Computer Aided Drafting (CAD)	3
DFT/ENE-42	SolidWorks I	3
DFT/ENE-51	Blueprint Reading	2
ENE-52	Geometric Dimensioning and Tolerancing	2
DFT/ENE-60	Math for Engineering Technology	3
or		
MAT-36	Trigonometry	4
Electives	(Choose from list below)	3-4

Electives (3-4 units)		
DFT/ARE-24	Architectural Drafting	3
DFT/ENE-23	Descriptive Geometry	3
DFT/ELE/ ENE-27	Technical Communications	3
DFT/ENE-42B	SolidWorks II	3
MAN-56 CNC	Machine Set-Up and Operation	4

Associate of Science Degree
The Associate of Science Degree in Drafting Technology will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

EARLY CHILDHOOD EDUCATION

EARLY CHILDHOOD EDUCATION (MNR)
NAS544/NAS544B/NAS544C/NCE544

The Early Childhood Education program provides an educational and practical foundation for students interested in working with children from infancy through third grade. In addition to theoretical principles, the curriculum offers practical skills and on-site training that will prepare students for employment in the field of Early Childhood Education. The program leads to certificates in Early Childhood Education and/or an Associate of Science Degree. The EAR courses will also fulfill the required child development coursework for the state issued Child Development Permit. Information regarding this permit and/or the Early Childhood Education Certificates are available from the Early Childhood Education Department.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Develop, implement, and evaluate developmentally appropriate thematic and emergent curriculum for children who are typical and atypical in the areas of physical, cognitive, language, creative and social/emotional growth.
- Develop and apply appropriate practices and effective techniques that respect the cultural diversity of young children and their families.
- Integrate an educational philosophy into classroom practices that reflects a personal belief supportive of theoretical principles regarding how and why young children should receive early educational experiences.
- Develop and implement a system of ongoing observational practices that contributes toward the creation of learning environments conducive to the emergence of curriculum that adapts to the evolving needs of children.

Required Courses (31 units)		Units
EAR-19	Observation and Assessment in Early Childhood Education	3
EAR-20	Child Growth and Development	3
EAR-24	Introduction to Curriculum	3
EAR-25	Teaching in a Diverse Society	3
EAR-26	Health, Safety and Nutrition	3
EAR-28	Principles and Practices of Teaching Young Children	3
EAR-30	Practicum in Early Childhood Education	4
EAR-42	Child, Family, and Community	3
Electives (Choose from list below)		6

Electives (6 units)		
EAR-23	Family Home Child Care Program	3
EAR-33	Infant and Toddler Development	3
EAR-34	Infant and Toddler Care and Education	3
EAR-37	School Age Child Care	3
EAR-38	Adult Supervision and Mentoring in ECE	3
EAR-40	Introduction to Children with Special Needs	3
EAR-41	Internship in Early Intervention/ Special Education	4
EAR-43	Children with Challenging Behaviors	3
EAR-44	Administration I: Programs in Early Childhood Education	3
EAR-45	Administration II: Personnel and Leadership in Early Childhood Education	3
EAR-46	Curriculum and Strategies for Children with Special Needs	3
EAR-47	Childhood Stress and Trauma	3
EAR-52	Parenting: Parents as Teachers	1
EAR-53	Parenting: Guiding Young Children-Approaches to Discipline	2
EAR-54	Parenting: Contemporary Parenting Issues	1
EAR-55	Parenting: Common Problems in Infancy and Childhood	1
ART-3	Art for Teachers	3
EDU-1	Introduction to Elementary Classroom Teaching	4
ENG-30	Children's Literature	3
KIN-6	Introduction to Physical Education for Preschool and Elementary Children	3
KIN-30	First Aid and CPR	3
MUS-1	Teaching Music to Young Children	3

Child Development Permit

Upon completion of the requirements for the certificate program and 16 units of special courses in general education, the student has fulfilled the course requirements for the Child Development Permit, teacher level. See the State guidelines for experience qualifications and additional levels. For child development interactive video information, see http://www.rcc.edu/departments/earlychildhoodstudies/Pages/Child-Development-Permit.aspx

For students interested in transferring to a California State University, please see the requirements for the Associate in Science in Early Childhood Education for Transfer degree in Section IV of this catalog.

Associate of Science Degree

The Associate of Science Degree in Early Childhood Education will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

EARLY CHILDHOOD INTERVENTION ASSISTANT (MNR)
NAS601/NAS601B/NAS601C/NCE601

This certificate is appropriate for students interested in working as an assistant or a paraprofessional in early intervention, early childhood special education, and community child development programs serving children with special needs. In addition to theoretical principles, the curriculum offers practical skills and on- site training that will prepare students for employment in the field of Early Childhood Intervention. The program leads to a certificate in Early Childhood Intervention and/or an Associate of Science Degree. The program will also fulfill the required child development coursework for the state issued Child Development Permit. Information regarding this permit and/or the Early Childhood Intervention Certificate is available from the Early Childhood Education Department.

Upon completion of the requirements for the certificate program and 16 units of special courses in general education, the student has fulfilled the course requirements for the Child Development Permit, Teacher Level. See the state guidelines for experience qualifications and additional levels. For interactive video information about the Child Development Permit, see www.rcc.edu/departments/earlychildhoodstudies/Pages/Child- Development-Permit.aspx

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of family function and structure, along with familial need for information and support that respects and values diverse cultures, values, beliefs and behaviors.
- Demonstrate basic knowledge of laws and regulations pertaining to and protecting children with disabilities and their families. Understand and identify the process of accessing community agencies, referral systems and procedures for specialized support, specialized documents, resources and placement options.
- Describe the typical child development milestones of children birth to adolescence and identify the strengths and special needs of the child in the context of his/her family, early childhood classroom, or early intervention setting.
- Describe the developmental assessment process and outline its role in identifying, planning and intervening for a child with special needs and his/her family, including the process of curriculum development.
- Demonstrate an understanding of the purpose and intent of an inclusive environment that supports the whole child while meeting the individual needs of children with disabilities.

Required Courses (34 units)		Units
EAR-19	Observation and Assessment in Early Childhood Education	3
EAR-20	Child Growth and Development	3
EAR-24	Introduction to Curriculum	3
EAR-28	Principles and Practices of Teaching Young Children	3
EAR-40	Introduction to Children with Special Needs	3
EAR-41	Internship in Early Intervention/Special Education	4
EAR-42	Child, Family, and Community	3
EAR-43	Children with Challenging Behaviors	3
EAR-46	Curriculum and Strategies for Children with Special Needs	3
Electives	(Choose from list below)	6

Electives (6 units)		
EAR-26	Health, Safety and Nutrition	3
EAR-33	Infant and Toddler Development	3
EAR-34	Infant and Toddler Care and Education	3
EAR-38	Adult Supervision and Mentoring in ECE	3
EAR-44	Administration I: Programs in Early Childhood Education	3
EAR-47	Childhood Stress and Trauma	3

Associate of Science Degree
The Associate of Science Degree in Early Childhood Intervention Assistant will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

The following certificates may lead to employment competency, but do not lead to an Associate of Science Degree:

EARLY CHILDHOOD EDUCATION ASSISTANT TEACHER (MNR) NCE795
This certificate enables the holder to care for and assist in the development and the instruction of children in a child development program while under supervision. Students select two classes out of EAR 20, 24, 28, and 42 to meet the requirements for this certificate.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of the theoretical perspectives in human development and education.
- Appraise the role of the child as an active learner.
- Integrate child growth and development into practical and meaningful applications.

Required Courses (6 units)		Units
Complete two courses from the list below:		
EAR-20	Child Growth and Development	3
EAR-24	Introduction to Curriculum	3
EAR-28	Principles and Practices of Teaching Young Children	3
EAR-42	Child, Family, and Community	3

EARLY CHILDHOOD EDUCATION/TWELVE CORE UNITS (MNR) NCE797
This certificate prepares the holder to provide service in the care, development, and instruction of children in a child development program. The 12 core units include EAR 20, 24, 28, and 42 and form the foundation upon which further early childhood coursework is built.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of the theoretical perspectives in human development and education.
- Appraise the role of the child as an active learner.
- Integrate child growth and development into practical and meaningful applications.

Required Courses (12 units)		Units
EAR-20	Child Growth and Development	3
EAR-24	Introduction to Curriculum	3
EAR-28	Principles and Practices of Teaching Young Children	3
EAR-42	Child, Family, and Community	3

ELECTRICIAN/ELECTRONICS

DIGITAL ELECTRONICS (N)
NAS656/NAS656B/NAS656C/NCE656

The Digital Electronics Program first prepares students with the fundamental theories of DC and AC electronic components, circuits & behaviors. It then grows to emphasize digital integrated circuit logic, analysis, design, mapping and simplification, and then culminates in microcontroller construction and programming. Printed Circuit Board (PCB) design will follow from schematic capture and circuit simulations. Students will learn to communicate, verbally and graphically, to a wide range of audiences, using various media and delivery methods. Completers of this program may qualify for a certificate, an Associate of Science Degree, or an entry level position in the Digital Electronics Industry, as knowledgeable and productive employees.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Fluently read and write electronic symbols of schematics, and develop schematic diagrams to guide the simulation, construction, maintenance, troubleshooting or repair of DC, AC, microcontrollers and digital circuits.
- Explain the operation of electronic components and predict their behavior in given circuit designs, and calculate solutions to complex networks, and justify the formulas and calculations.
- Capture a schematic of a mixed-signals circuit, using the appropriate electronics computer-aided-design (CAD) software, and simulate the behavior of it, and then create a PCB design for that circuit. Then, after fabrication of a Printed Circuit Board (PCB), "stuff" and solder components to it, test and contrast with simulation predictions.
- Fluently read and write Boolean Algebra logic equations, symbols, truth-tables and circuits, then synthesize logic forms, simplify to lowest terms, and implement circuits using only NAND or NOR logic gates.
- Design, program, compile, install, wire, test, verify and explain the proper operation of a microcontroller with respect to given specifications, then explain the purpose and methods whereby a microcontroller may perform math, logic or conversions between analog and digital forms.

Required Courses (29 units)		Units
ELC/ELE-11	DC (Direct Current) Electronics	4
ELC/ELE-13	AC (Alternating Current) Electronics	4
ELE-25	Digital Techniques	4
ELE-26	Microcontrollers	3
ENE/ELE-27	Technical Communications	3
ELE-28	MultiSim CAD PCB Design/Fab	3
Electives	Choose from the list below	7

Electives (7 units)

ELE-10	Survey of Electronics	4
ELE-23	Electronic Devices and Circuits	4
ELE/MAN-61	Robotics for Manufacturing	3
ELE/MAN-63	LabView Visual Programming for Automated Systems	3
ELE/MAN-64	Programmable Logic Controllers	3
ELC/ELE-91	Fundamentals of Solar Energy	3
ELE-200	Electronics, Work-Experience	1-4
MAN-55	Occupational Safety and Health Administration (OSHA) for General Industry	1

Associate of Science Degree
The Associate of Science Degree in Digital Electronics will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

ELECTRICIAN (N) NAS766/NAS766B/NAS766C/NCE766

This program prepares students to become an entry-level electrician trainee and along with California State requirements prepares for careers as an electrician, electrical apprentice, electrician's helper, industrial electrician, journeyman electrician, and residential electrician. Courses are aligned with California State standards to prepare students to earn their Electrician Training card (www.dir.ca.gov/dlse/ecu/electricaltrainee.htm).

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate the installation maintenance and troubleshooting of electrical devises (switches, sensors, motor, controllers, and lights).
- Explain how the electrical grid works, from generation to the end user.
- Solve electrical design criteria by using formula, and tables for proper electrical installation.
- Demonstrate electrical raceway sizing and installation, meeting NEC requirements for sizing, location requirements, distances, supports and bending.
- Demonstrate quantitative analysis of electrical circuits for blueprints.
- Demonstrate electrical wiring of circuits or devices to meet the standards and requirement of the NEC.

Required Courses (31-32 units):		Units
ELC/ELE-71	Residential Electrical Wiring	4
ELC/ELE/MAN-72	Commercial and Industrial Electrical Wiring	4
ELC/ELE/MAN-73	Electric Motors and Transformers	4
ELC/ELE/MAN-74	Industrial Wiring and Controls	4
ELC/ELE-75	Solid State Devices and Lighting Controls	3
ELC/ELE-76	Low Voltage Wiring and Alternate Energy Generation	3
ELC/ELE/MAN-77	Electrical Theory for Electricians	3

ENE-62	Math for Automated Systems	3
or		
MAT-36	Trigonometry	4
CON-66	National Electrical Code	3

Associate of Science Degree
The Associate of Science Degree in Electrician will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

ELECTRICIAN APPRENTICESHIP (N)

NAS485/NAS485B/NAS485C/NCE485

A five-year apprenticeship program, consisting of full time, on-the-job employment plus related classroom instruction. Completers of this program may qualify for certificate, Associate of Science Degree, and/or a Journey person trade certificate. Students who wish to obtain an Associate in Arts Degree may do so by fulfilling the general graduation requirements in addition to the completion of the apprenticeship courses.

Applicants for Riverside/San Bernardino/Mono/Inyo counties should be directed to the Riverside and San Bernardino Joint Electrical Apprenticeship Training. Committees, 1855 Business Center Drive, San Bernardino, CA 92408. Telephone: (909) 890-1703.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Apply a working knowledge of math formulas and complex solution methods related to the electrical trades, along with blueprint symbols and drawings of wiring diagrams with common schematic symbols, including troubleshooting of common system faults, detection and repair, while properly applying OSHA construction site safety standards to all practices.
- Properly apply all pertinent National Electric Code (NEC) to all workplace practices involving DC, AC single and poly-phase systems, utilizing proper grounding, bonding, lightning protection, wire sizing, conduit fill, overload protection, layout, connections, installations, troubleshooting, fault isolation, repairs or modifications.
- Demonstrate appropriate leadership and expertise in applying special control and monitoring functions related to layout, installation, testing, and troubleshooting of digital and analog systems involving such ancillary equipment as CATV, CCTV, telephone circuits, Programmable Logic Controllers (PLCs), sensors, actuators, low-voltage and high-voltage, transformation, interfacing, hardware, setup, and programming services needed to comply with all NFPA-70E (NEC) and OSHA regulations for safety and fitness.

Required Courses (35 units)		Units
ELE-400	Introduction to the Electrical Trades and Construction Safety	3.5
ELE-406	Grounding Systems, Advanced Blueprints and Specifications, Motor Design and Installation, and National Electric Code	3.5
ELE-407	Motor Control Principles, Generators and Power Supplies, with National Electric Code (NEC)	3.5
ELE-408	Transformer Theory, Leadership, Management, and Test Equipment	3.5
ELE-409	Electrician Specialty Systems	3.5
ELE-401	Introduction to Electrical Theory, Basic Math Concepts, and the National Electric Code	3.5
ELE-402	Advanced DC Circuit Concepts, Introduction to 3-Phase AC Circuits, Test Equipment, and National Electric Code Applications	3.5
ELE-403	AC Circuit Concepts, Applied Electronics, and National Electric Code Applications	3.5
ELE-404	Digital Logic Circuits, Conductor Characteristics, Applications, and National Electric Code (NEC)	3.5
ELE-405	Electrician Blueprint Reading with Code Applications for National Electrical Code (NEC)	3.5

Associate of Science Degree
The Associate of Science Degree in Electrician Apprenticeship will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

SOUND AND COMMUNICATION SYSTEMS INSTALLER APPRENTICESHIP NAS644/NCE644

The new 37 unit Sound & Communication Systems Installer Apprenticeship certificate and AS degree will create a three-year apprenticeship program with the International Brotherhood of Electrical Workers (IBEW). Norco College will become the Lead Education Agency for the program.

The goal of the Sound & Communication Systems Installer Apprenticeship Program at Norco College is to provide electrical apprentices with the up-to-date knowledge and technical skills to complete the California state requirements to begin a career as a licensed journeyman, a craftsperson recognized for his or her knowledge and ability in the selected trade. The program will allow students to work in the trade while taking courses. The students will be earning a wage while on the job. As they progress through the apprenticeship they will increase their skill set.

- Analysis a circuit of electrical device(s) with the appropriate meters or testing equipment so that troubleshooting of common system faults can be detected and repair.
- Demonstrate electrical wiring of circuits or devices to meet the standards and requirement of the NEC
- Residents within Riverside/San Bernardino/ Mono/Inyo counties will be able to jointly apply to the Riverside and San Bernardino Joint Electrical Apprenticeship Training Committees via the International Brotherhood of Electrical Workers. Applicants must submit proof of high school diploma or GED, be at least 18 years of age, and official unopened transcripts showing successful completion of one year of high school or College Algebra 1 or higher. The applicant will then complete a written aptitude test and oral interview to be placed on the eligibility list.

Required Major Total: (37 units)		Units
ELE-420	Intro to Sound/Communication	3.5
ELE-421	Electrical Theory and Practices DC	3.5
ELE-422	Electrical Theory and Practices AC	3.5
ELE-423	Semiconductor Electronics	3.5
ELE-424	Intro to Digital Electronics and Signaling Devices	3.5
ELE-425	Management/Alarms/Codes/Circuits	3.5
ELE-499	Work Experience in Electricians Apprenticeship	1-4

The following certificates may lead to employment competency, but do not lead to an Associate of Science Degree:

GREEN TECHNICIAN (N) NCE856

Renewable energy and related sustainability concepts; DC and AC electrical theory; and solar power systems. Design, installation, and maintenance issues along with OSHA safety are included.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Draw and identify all the primary components of a typical, 4-KW, utility-interactive, photo voltaic (PV) system and explain how each part operates in this grid-tied configuration.
- Solve basic, direct current, electronic problems involving resistance, current, voltage, and power, as applied to both simple and complex combinations of series and/or parallel circuit components, comprised of resistors, capacitors and coils, in a given network configuration.
- Explain the basic principles of sinusoidal sources of Alternating Current (AC) and solve AC network circuit problems involving resistors, capacitors, inductors and/or transformers.
- Utilize OSHA standards and regulations to supplement an ongoing safety and health program.
- Thoroughly explain the typical maintenance requirements for the PV array and other components, including inverters and batteries of a stand-alone system, to keep a 5-KW, off-grid power installation safe and operating at high-efficiency.

Required Courses (12 units)		Units
ELE-91	Fundamentals of Solar Energy	3
ELE/MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	1
ELC/ELE/MAN-77	Electrical Theory for Electricians	3
or		
ELE-11	DC Electronics	4
and		
ELE-13	AC Electronics	4

ENGINEERING TECHNOLOGY

PRE-ENGINEERING (N) NAS763
(CSUGE) NAS764/(IGETC) NAS765

This program is designed to prepare students for a possible major in an Engineering related field. Possible university engineering majors include: Civil Engineering, Computer Engineering and Mechanical Engineering.

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate the standard methods of mathematical analysis including trigonometry and analytic geometry, differential and integral calculus, and the solutions to differential equations.
- Demonstrate a working knowledge of the theories and principles of physics.
- Conduct experiments and analyze and interpret data collected.

Required Courses (24-26 units)		Units
MAT-1A	Calculus I	4
MAT-1B	Calculus II	4
PHY-4A	Mechanics	4
Choose one of the following:		
PHY-4B	Electricity and Magnetism	4
or		
PHY-4C	Heat, Light and Waves	4
Electives	Choose from the list below	8-10

Elective Courses (8-10 units)		
CHE-1A	General Chemistry, I	5
CHE-1B	General Chemistry, II	5
MAT-1C	Calculus III	4
PHY-4B	Electricity and Magnetism (if not used above)	4
or		
PHY-4C	Heat, Light and Waves (if not used above)	4

Associate of Science Degree

The Associate of Science Degree in Pre-Engineering will be awarded upon completion of the degree requirements including Intersegmental General Education Transfer Curriculum (IGETC) or California State University General Education (CSUGE) or RCCD General Education requirements.

ENGINEERING GRAPHICS (N) NCE796

Certificate Program

Program Learning Outcomes

Students will demonstrate proficiency sufficient to apply for and obtain entry-level employment in the field of engineering by completing a portfolio, which may include sketches, Computer Aided Drafting (CAD), 3-D models, and rapid prototyping.

Required Courses (9 units)		Units
ENE-21	Drafting	3
ENE-22	Engineering Drawing	3
ENE-30	Computer-Aided Drafting(CAD)	3

3D MECHANICAL DRAFTING (N) NCE863

This certificate includes courses intended to help students qualify for an entry level CAD operator/drafter or help someone, already in industry, to update their skills. Students can expect an entry level position as a CAD operator, mechanical drafter, engineering assistant and engineering technician.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of 3D mechanical modeling so as to be able to capture design intent in a 3D model.
- Map out the most efficient path in 3D model creation.
- Reverse engineer existing parts and recreate them as 3D computer models.

Required Courses (9 units)		Units
ENE-21	Drafting	3
ENE-42	SolidWorks I	3
ENE-42B	SolidWorks II	3

GAME DEVELOPMENT

GAME ART: CHARACTER MODELING (N)

NAS687/NAS687B/NAS687C/NCE687

Students completing the Game Art: Character Modeling program will possess advanced knowledge of digital modeling as well as applied skills in rigging and materials. Students will gain skills in figure drawing and the application into a game environment. The final course of this program is a capstone project where students work in an interdisciplinary team with students from the other tracks of the game development programs to create a complete, original game ready to publish. Students will complete the program with a polished portfolio. Students will complete the program with a polished portfolio and be prepared to enter the workforce as a character modeler, environment modeler, lighting artist, or 3D artist.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Understand and utilize the production pipeline and workflow between Maya and ZBrush for modeling characters for use in Game, Animation and Simulation.
- Analyze and construct bipedal, quadruped and anthropomorphic character models for use in Game, Animation and Simulation.
- Utilize the industry standard techniques of Maya and ZBrush to create both low poly and high poly models for use in Game, Animation and Simulation.
- Produce industry quality character models that demonstrate a thorough understanding of anatomy and proportion as well as proper topology flow as it pertains to modeling characters for use in Game, Animation and Simulation.
- Analyze, differentiate, and construct character models that demonstrate an understanding of standard industry artistic styles such as hyper-realism, cartoony and stylized design.
- Demonstrate mastery of interdisciplinary communication and team skills while working with colleagues in an industry standard production project.
- Create an industry standard portfolio and demo reel containing 3D character models developed in class projects.

Required Courses (44 units)		Units
GAM-21	History of Video Games	3
GAM-32	Designing Game Characters	3
GAM-33	Advanced Digital Sculpting	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-41	Game Asset and Engine Integration	3
GAM/CIS-44	Portfolio Production	2
GAM-70	Game Development Basics	2
GAM-71	Perspective for Game and Animation	3
GAM-72	Anatomy for Game Art	3
GAM-73	Storyboarding for Games	3
GAM-79B	Game Studio: Character Modeling	4
GAM-80	Digital Drawing for Game Art	4
GAM-81	3D Modeling and Texturing	4
GAM-82	Game Rigging and Animation	4

Associate of Science Degree

The Associate of Science Degree in Game Art: Character Modeling will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

GAME ART: ENVIRONMENTS AND VEHICLES (N)

NAS688/NAS688B/NAS688C/NCE688

Students completing the program will be well qualified to create large scale models including environments, props, and vehicles, as well as indoor and specialized enclosures in video game worlds. The final course of this program is a capstone project where students work in an interdisciplinary team with students from the other tracks of the game development programs to create a complete, original game ready to publish. Students will complete the program with a polished portfolio and be prepared to enter the field as a 3-D environments artist, prop modeler, level builder or junior modeler. 3D character models developed in class projects.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Employ the proper use of industry standard terminology to describe geometry and scenes in a 3D environment.
- Utilize both polygonal and nurbs modeling to create 3D hard surface and organic objects for use in game,

animation and simulation environments.
- Create digital vehicles, terrains and environments to scale according to a specific art style direction containing aspects of realism, futuristic and fantasy based design and function.
- Demonstrate mastery of interdisciplinary communication and team skills while working with colleagues in an industry standard production project.
- Create an industry standard portfolio and demo reel containing 3D environments and vehicle models developed in class projects.

Required Courses (38 units)		Units
GAM-21	History of Video Games	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-41	Game Asset and Engine Integration	3
GAM/CIS-44	Portfolio Production	2
GAM-46	Environment and Vehicle Modeling	3
GAM-70	Game Development Basics	2
GAM-71	Perspective for Game and Animation	3
GAM-73	Storyboarding for Games	3
GAM-79C	Game Studio: Environments and Vehicles	4
GAM-80	Digital Drawing for Game Art	4
GAM-81	3D Modeling and Texturing	4
GAM-82	Game Rigging and Animation	4

Associate of Science Degree
The Associate of Science Degree in Game Art: Environments and Vehicles will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

GAME DESIGN (N) NAS685/NAS685B/NAS685C/NCE685
Students completing the Game Design program will be well qualified in the game design process, including game design documentation, standard game design techniques and tools for rapid prototyping including both non-digital and digital methods. Students will be prepared to enter the field as an independent designer, assistant producer, or junior level designer. The final course of this program is a capstone project where students work in an interdisciplinary team with students from the other tracks of the game development programs to create a complete, original game ready to publish. Students will complete the program with a polished portfolio and be prepared to enter the workforce.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:
- Apply the principles of theoretically sound game design including gameplay, core mechanics, game balancing, and iterative rapid prototyping to produce both non-digital and digital original games.
- Contribute to a comprehensive game design document which facilitates team management including communication, milestones/deadlines and responsiveness.
- Develop content that contributes to a milestone based studio pipeline.
- Demonstrate mastery of interdisciplinary communication and team skills while working with colleagues on an industry standard production project.
- Create an industry standard portfolio utilizing games and class projects.

Required Courses (33 units)		Units
GAM-21	History of Video Games	3
GAM-22	Game Design Principles	4
GAM-23	Digital Game Design	4
GAM-24	Video Game Prototyping	4
GAM-35	Introduction to Simulation and Game Development	3
GAM-42	Photoshop for Game Art and Animation	3
GAM/CIS-44	Portfolio Production	2
GAM-50	Introduction to Game Programming	3
GAM-79E	Game Studio: Game Design Capstone	4

Associate of Science Degree
The Associate of Science Degree in Game Design will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

GAME PROGRAMMING (N)
NAS691/NAS691B/NAS691C/NCE691
Students completing the Game Programming Certificate or A.S. degree will be well qualified in the process of designing and coding programming logic for games including coding game rules, mechanics and simulations, to create complete modules and game experiences. The final course of this program is a capstone project where students work in an interdisciplinary team with students from the other tracks of the game development programs to create a complete, original game which is ready to publish. Students will complete the program with a polished portfolio and be prepared to enter the workforce as an independent game developer specializing in game programming.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:
- Assemble multimedia assets into a single project and provide meaning and structure to those assets through programmatic solutions.
- Construct complex systems to facilitate game rules, mechanics, and simulations.
- Build games or applications driven by mathematics and physics concepts in an architecturally sound software design.
- Apply concepts and techniques in game programming to create complete modules and game experiences at an advanced level.
- Create an industry-standard portfolio containing code samples from class projects.
- Demonstrate professional communication skills effectively with colleagues on an industry production project.

Required Courses (37-38 units)		Units
GAM-24	Video Game Prototyping	4
GAM-35	Introduction to Simulation and Game Development	3
GAM/CIS-44	Portfolio Production	2
GAM-50	Introduction to Game Programming	3
GAM-51	Game Mechanics and Simulation	3
GAM-52	Game Engine Scripting I	3
GAM-53	Game Engine Scripting II	3
GAM-79F	Game Studio Production: Game Programming	4
MAT-35	Intermediate Algebra	5
Electives	Choose from list below	7-8

Electives (7-8 units)		
GAM-21	History of Video Games	3
GAM-22	Game Design Principles	4
GAM-80	Digital Drawing for Game Art	4
GAM-81	3D Modeling and Texturing	4

Associate of Science Degree
The Associate of Science Degree in Game Programming will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

GENERAL BUSINESS

See BUSINESS ADMINISTRATION

LOGISTICS MANAGEMENT

This program prepares individuals to manage business logistics functions, ranging from acquisitions to receiving and handling, through internal allocation of resources to operations units, and delivery to the final customer. This includes instruction in the domestic and international aspects of logistics contracts and purchasing, computerized logistics systems, inventory control, warehousing, transportation, and freight claims. Emphasis is placed on the efficient and effective integration of all logistics activities.

LOGISTICS MANAGEMENT (N)
NAS579/NAS579B/NAS579C/NCE579
This program prepares students for entry into or career growth within the logistics industry, and ongoing study of the field. The focus is integrated logistics, a necessity for management of effective and efficient supply chains. Logistics disciplines covered include warehousing, transportation, service contracting, purchasing, global logistics, etc.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Compare roles and objectives of the logistics disciplines.
- Understand how logistics functions can interact to efficiently use total personnel, facilities and equipment;
- Contribute knowledge needed by multidisciplinary teams to effectively integrate and exceed end user (customer) expectations.
- Analyze, prepare, file and process claims when unavoidable freight disputes arise.
- Explain how the overall flow of goods, services and information can be optimized to satisfy customer and business goals.
- Identify 3rd party logistics provider and client needs in negotiations, bidding and contracts, as well as legal and regulatory constraints to integrated logistics.
- Describe roles and value added by global logistics intermediaries.

Required Courses (18 units)		Units
BUS-80	Principles of Logistics	3
BUS-82	Freight Claims	1.5
BUS-83	Contracts	1.5
BUS-85	Warehouse Management	3
BUS-86	Transportation and Traffic Management	3
BUS-87	Purchasing and Supply Management	3
BUS-90	International Logistics	3

Note: Students may petition to have elective credit applied toward this Certificate for military training, extra-institutional learning, and transfer or articulated courses in logistics disciplines. Students must complete at least 9 units at Norco College from the above list for such credit to apply

Associate of Science Degree
The Associate of Science Degree in Logistics Management will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

Program Learning Outcomes
In addition to achieving the program learning outcome for the logistics management certificate program, students who complete the Associate of Science Degree in Logistics Management will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

MANAGEMENT

See BUSINESS ADMINISTRATION

MANUFACTURING TECHNOLOGY

This program prepares individuals to apply basic engineering principles and technical skills to the identification and resolution of production problems in the manufacture of products. This includes instruction in machine operations, production line operations, engineering analysis, systems analysis, instrumentation, physical controls, automation, computer-aided manufacturing (CAM), manufacturing planning, quality control, and informational infrastructure.

FACILITY MAINTENANCE (N)

NCE771/NAS771

The Associate in Science in Facility Maintenance program prepares students for jobs such as entry-level facility maintenance technician, field service technician, industrial maintenance technician, maintenance mechanic, or maintenance repair mechanic.

Students will gain skills in: safety standards, technical math, blueprint reading, troubleshooting, preventative maintenance, drive components, lubrication, bearings, wiring methods, hydraulics, pneumatics, basic electricity, technical communication and more. Students will learn and apply maintenance methods to repair and maintain commercial or industrial facilities, including the machinery in buildings, plants, and factory settings.

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate knowledge of maintenance techniques.
- Apply maintenance fundamentals to simulated and actual workplace applications.
- Recognize, identify, and describe the functions of hand and power tools.
- Troubleshoot and repair a given, complex configuration of maintenance equipment and create a thorough report, including necessary interactions with tools and safety standards.

Required Courses (24-25 units)		Units
MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	2
ELE/MAN-69	Fundamentals of Tooling and Test Equipment	2
ELE/MAN-68	Fundamentals of Maintenance	3
ELE/ENE-27	Technical Communications	3
ENE-51	Blueprint Reading	2
ELE/MAN-77	Electrical Theory	3
MAN-60	Hydraulic and Pneumatics Systems	3
ELE/CON-66	National Electrical Code	3
ENE-60	Math for Engineering Technology	3
or		
MAT-36	Trigonometry	4

None of the courses in the area of emphasis require a prerequisite course.
*Total Major Units: 24-25 Units
*General Education Requirements: 35-36 Units
Total A.S. Degree Units: 60 Units

Note: Students must complete all Facility Maintenance Major Core Requirements and must complete Major Concentration Requirements (total of 30 units) in order to receive the certificate in the concentration area of their choice.

Associate of Science Degree

The Associate of Science Degree in Facility Maintenance will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

INDUSTRIAL AUTOMATION (N)

NAS737/NAS737B/NAS737C/NCE737

Businesses and other organizations depend on complex electronic equipment for a variety of functions. Industrial controls automatically monitor and direct production processes on the factory floor. Transmitters and antennae provide communication links for many organizations. Industry needs well-trained technicians with the knowledge of how to design, repair and implement new equipment. The Industrial Automation program teaches how to use Electronics, Microprocessors, Microcontrollers, Programmable Logic Control and Fluid Power systems to create and program new machinery used in industry. This certificate prepares students for employment as an automated systems technician, maintenance mechanic, or general maintenance worker.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate the installation maintenance and troubleshooting of Programmable Logic Control systems (PLCs) and PLC modules.
- Set-up and operate fluid powered valves, cylinders, controls filters, and actuators.
- Solve formulas by using unknowns and apply this knowledge to solve problems encountered in technological areas and various fields of engineering.

Required Courses (23-24 units)		Units
ELE-10	Survey of Electronics	4
ELE/ENE-27	Technical Communications	3
ELE-74	Industrial Wiring and Controls	4
ELE/MAN-64	Programmable Logic Controllers	3
ENE-51	Blueprint Reading	2
ELE/MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	1
MAN-60	Hydraulics and Pneumatic Systems	3
ENE-62	Math for Automation	3
or		
MAT-36	Trigonometry	4

Associate of Science Degree

The Associate of Science Degree in Industrial Automation will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

Program Learning Outcomes

In addition to achieving the program learning outcomes for the Industrial Automation certificate program, students who complete the Associate of Science Degree in Industrial Automation will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

COMPUTER NUMERICAL CONTROL PROGRAMMING (N) NAS655/NAS655B/NAS655C/NCE655

This program prepares individuals for an entry level career in computer numerical control programming. Computer control programmers and operators use computer numerically controlled (CNC) machines to cut and shape precision products, such as automobile, aviation, and machine parts. CNC machines operate by reading the code included in a computer-controlled module, which drives the machine tool and performs the functions of forming and shaping a part formerly done by machine operators. CNC machines include machining tools such as lathes, multi-axis spindles, milling machines, laser cutting machines, and wire electrical discharge machines. CNC machines cut away material from a solid block of metal or plastic—known as a workpiece—to form a finished part. Computer control programmers and operators normally produce large quantities of one part, although they may produce small batches or one-of-a-kind items. They use their knowledge of the working properties of metals and their skill with CNC programming to design and carry out the operations needed to make machined products that meet precise specifications.

CNC programmers—also referred to as numerical tool and process control programmers—develop the programs that run the machine tools. They review three-dimensional computer aided/automated design (CAD) blueprints of the part and determine the sequence of events that will be needed to make the part. This may involve calculating where to cut or bore into the workpiece, how fast to feed the metal into the machine, and how much metal to remove.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Create a steam or stirling engine based on blueprints that involves parts using both the mill and the lathe.
- Create five-axis part drawing files using Computer Aided Manufacturing program such as Mastercam, numerical code files and Solid Works.
- Compose written assignments on occupation safety in general industry.
- Solve mathematical formulas by using unknowns and apply this knowledge to solve problems for the industry.
- Establish a systematic approach to recognizing the essential information given on a blueprint.

In addition to achieving the program learning outcomes for the Computer Numerical Control programming certificate, students who complete the Associate of Science Degree in Computer Numerical Control Programming (CNC) technology will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

Required Courses (26-27 units)		Units
ENE-30	Computer Aided Drafting (CAD)	3
ENE-42	SolidWorks I	3
ENE-51	Blueprint Reading	2
ENE-52	Geometric Dimensioning and Tolerancing	2
ENE-60	Math for Engineering Technology	3
or		
MAT-36	Trigonometry	4
MAN-35	Computer-Aided Manufacturing-Mastercam	5
MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	1
MAN-56	CNC Machine Set-up and Operation	4
MAN-57	CNC Program Writing	3

Associate of Science Degree

The Associate of Science Degree in Computer Numerical Control Programming will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

The following certificate may lead to employment competency, but does not lead to an Associate of Science Degree:

COMPUTER NUMERICAL CONTROL (CNC) OPERATOR (N) NCE799

This certificate is designed to provide entry-level skills to operate a Computer Numerical Control (CNC) lathe or milling type machine tool. Upon completion, students could secure employment as a CNC Operator.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate sufficient proficiency to apply for and obtain entry-level employment in the field of computer numerical control technology.
- Create parts specified by the National Institute of Metalworking Skills (NIMs).
- Create a portfolio which may include portable document files (PDF) printouts of CNC programs created during the program's courses.
- Solve formulas by using unknowns and apply this knowledge to solve problems encountered in technology areas and various fields of machining.
- Establish a systematic approach to recognize the essential information given on a blueprint.

Required Courses (17 units)		Units
ENE-42	Solid Works I	3
ENE-51	Blueprint Reading	2
MAN-36	General machine shop and theory of machining	4
MAN-55/ELE-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	1
MAN-56	CNC Machine Set-up and Operation	4
MAN-57	CNC Program Writing	3

CONVENTIONAL MACHINE OPERATOR (N) NCE865

This certificate is designed to prepare students with basic entry-level machine operator skills, safety knowledge, theory, and quality control skills in manufacturing processes. Students obtaining this certificate will qualify for the first level certification in National Industry Metal Skills (NIMS). This certificate prepares students for employment as Conventional Machinists, Machine Operators, and/or Machine Tool Cutting Setters.

Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate aptitude in safely setting up and operating the lathe, mill, drill press, saw and grinder.
- Demonstrate use of gages (gage blocks and pins), calculate angles for work setup, utilize the proper precision measuring tools when machining.
- Create parts specified by the National Institute of Metalworking Skills (NIMs) using conventional machining.
- Establish a systematic approach to recognize the essential information given on a blueprint

Required Courses (10 units)		Units
ENE-42	SolidWorks I	3
ENE-51	Blueprint reading	2
MAN-36	General machine shop and theory of machining	4
MAN-55/ELE-55	OSHA Standards for General Industry	1

MUSIC

MUSIC **NAA564, NAA564B, NAA564C**
PROGRAM PREREQUISITE: None.
SHORT DESCRIPTION of PROGRAM
The Associate in Arts in Music Degree is designed to prepare the student for the rigors of becoming a music major at four year institutions of higher education and is specifically intended to satisfy many of the lower division requirements for the Baccalaureate in Arts in Music at the California State University and University of California. This degree is designed to prepare students to demonstrate competence and discipline in the study of music theory, music analysis, music composition, and musicianship skills, and demonstrate proficiency in ensemble skills and solo performance skills. Completion of this curriculum will demonstrate commitment to the serious study of Music in practice and in theory and provide comprehensive preparation for upper division work.

Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Demonstrate ensemble specific performance practices and professional standards of conduct expected of ensemble participants.
- Perform solo literature with an accompanist (if appropriate) using stylistically accurate rhythm, pitch, diction (or articulation) and musical expression.
- Demonstrate the ability to "audiate" a musical score by sight reading and performing complex rhythms and by sightsinging chromatic, modulating, and post-tonal melodies.
- Demonstrate the ability to recognize patterns and musical function by aurally identifying and transcribing scales, modes, post-tonal melodies, and complex harmonic progressions.
- Analyze chromatic harmonic progressions that include modulation using 20th century techniques.
- Write, analyze, and compose music using 20th century techniques, such as: tone row, set theory, augmented sixth chords, pandiatonicism and polytonalism.
- Demonstrate keyboard proficiency at the level required to perform theoretical concepts studied in music theory courses.

Required Courses		Units
MUSIC THEORY (16 units)		
MUS 3	Music Fundamentals	4
MUS 4	Music Theory I	4
MUS 5	Music Theory II	4
MUS 6	Music Theory III	4
APPLIED MUSIC (10-12 units; 4 semesters of study from the following)		
MUS 38	Beginning Applied Music I	2
MUS 78	Beginning Applied Music II	2
MUS 39	Intermediate Applied Music I	3
MUS 79	Intermediate Applied Music I	3
OR		
MUS 39 2x	Intermediate Applied Music I	3(6)
MUS 79 2x	Intermediate Applied Music II	3(6)
MUSIC ENSEMBLES (8 units from the following over 4 semesters)		
MUS 41	Chamber Choir	2
MUS 81	Consort Singers	2
MUS 77	Guitar Ensemble	2
MIS 11a	Studio Arts Ensemble I	2
MIS 11b	Studio Arts Ensemble II	2

Total Units: 34-36

Recommended Courses:
Keyboard Proficiency - Most 4-year institutions require that lower-division students pass a keyboard proficiency exam. The following courses are recommended to prepare students for the the exam (4 units from the following):

MUS 32a	Class Piano I	1
MUS 32b	Class Piano I	1
MUS 32c	Class Piano I	1
MUS 32d	Class Piano I	1
MUS 53	Keyboard Profiency	1

Associate of Arts Degree
The Associate of Arts Degree in Music Industry Studies: Performance will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

MUSIC INDUSTRY STUDIES: AUDIO PRODUCTION

NAS684/NAS684B/NAS684C/NCE684

PROGRAM PREREQUISITE: None

The Music Industry Studies certificate in Audio Production is designed to provide students with the knowledge and skills necessary for producing popular music, and engineering in the recording studio as well as for live sound. Courses allow students to become proficient on a DAW (Digital Audio Workstation); gain experience recording and producing music on digital and analog devices; and record and mix in a state-of-the-art multi-track digital recording studio. Classes are taught utilizing industry-standard software and equipment in state-of-the-art facilities. The program prepares students for a wide variety of careers as music producers or audio engineers in studio and/or live performance settings.

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of musicianship and music theory.
- Employ music technology to create and refine musical product.
- Sensitively enhance multitrack recordings and live performances as a mixing engineer.
- Collaborate effectively with peers to create new musical works that exhibit quality and craftsmanship.
- Demonstrate a fundamental understanding of intellectual property law as it applies to music.

Required Courses		Units
Core (13 units)		
MIS-1A	Studio Techniques	2
MIS-1B	Studio Techniques	2
MIS-1C	Studio Techniques	2
MUS-3	Fundamentals	4
MUS-93	Business of Music	3
Electives (21-23 units)		
MIS-2	Songwriting	2
MIS-3	Digital Audio Production	1-4
MIS-4	Digital Audio Production	2-4
MIS-7	Intro to Music Technology	3
MIS-12	Live Sound	3
MIS-13	Studio Recording Workshop	3
AND		
4-6 units from the following:		
Elective Courses		Units
COM-9	Interpersonal Communication	3
MUS-4	Music Theory	4
MUS-23	History of Rock and Roll	3
MUS-32A	Class Piano	2
MUS-32B	Class Piano	2
MUS-32C	Class Piano	2
MUS-38	Beginning Applied Music	2
MUS-39	Applied Music	1-3
MIS-200	Work Experience	1-4

Total Units: 34-37 units

Associate of Science Degree

The Associate of Science Degree in Music Industry Studies: Audio Production will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

PERFORMANCE (N)

NAA645/NAA645B/NAA645C/NCE645

The Music Industry Studies Performance Certificate is designed to provide students with the knowledge and skills necessary for studio recording and live performance in the commercial music industry. Courses allow students to become proficient on an instrument or voice, gain experience as an ensemble member, study the fundamentals of music including sight-reading and piano skills, become familiar with digital and analog music technology, and record and mix in a state-of-the-art multi-track digital recording studio. Classes are taught utilizing industry-standard software and equipment in state-of-the-art facilities. The program prepares students for a variety of careers as instrumentalists and vocalists in studio and/or live performance settings.

Certificate Program

Program Learning Outcomes

Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of musicianship and music theory.
- Employ music technology to create and refine musical product.
- Sensitively interpret and communicate musical literature as a performer or studio musician.
- Collaborate effectively with peers to create new musical works exhibiting quality and craftsmanship.
- Demonstrate a fundamental understanding of intellectual property law as it applies to music.

Required Courses (33 units)		Units
MIS-1A	Studio Techniques	2
MIS-1B	Studio Techniques	2
MIS-1C	Studio Techniques	2
MUS-3	Fundamentals	4
MUS-93	Business of Music	3
MUS-39	Applied Music II (2x)	3
MUS-79	Applied Music II (2x)	3
(4 semesters of study)		
MUS 41	Chamber Singers (4x)	2
or		
MUS 41	Chamber Singers (2x)	2
And		
MIS 81	Consort Singers (2x)	2
or		
MIS-11A	Studio Arts Ensemble (2x)	2
MIS-11B	Studio Arts Ensemble (2x)	2
(4 semesters of study for 8 units total)		
AND		
3-4 units from the following:		

Elective Courses		Units
MIS-3	Digital Audio Production	1-4
MIS-7	Intro to Music Technology	3
MUS-4	Music Theory	4
MUS-23	History of Rock and Roll	3
MUS-32A	Class Piano	2
MUS-32B	Class Piano	2
MUS-32C	Class Piano	

Total Units: 36-37 units

Associate of Arts Degree
The Associate of Arts Degree in Music Industry Studies: Performance will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

REAL ESTATE
See BUSINESS ADMINISTRATION

RETAIL MANAGEMENT/WAFC

This program prepares individuals to perform operations associated with retail sales in a variety of settings. This includes instruction in over-the-counter and other direct sales operations in business settings, basic bookkeeping principles, customer service, team/ staff leadership and supervision, floor management, and applicable technical skills.

RETAIL MANAGEMENT/WAFC (NR) (WESTERN ASSOCIATION OF FOOD CHAINS)
NAS536/NAS536B/NAS53 6C/NCE536

Certificate Program
Program Learning Outcomes
Upon successful completion of this program, students should be able to:

- Use Generally Accepted Accounting Principles or International Accounting Standards guidelines to review and interpret financial documents.
- Calculate pricing models for mark-ups, profit margins for perishable and lost goods, discounts, and sinking funds.
- Prepare and deliver effective oral and written communications through multiple modes in multiple situations.
- Create and use basic word processing documents, spread sheets and visual (Power Point) presentations.
- Create and present a research paper on selected topics.
- Effectively apply basic management principles to actual and role-played work situations.
- Analyze and assess the legal and productivity implications of work conflicts.
- Effectively communicate in small groups.
- Analyze the effectiveness of marketing decisions and use marketing principles to assess market potential.

Required Courses (30 units)		Units
ACC-1A	Principles of Accounting I	3
or		
ACC/CAT-55	Applied Accounting/Bookkeeping	3
BUS-20	Business Mathematics	3
BUS-22	Management Communications	3
or		
BUS-24	Business Communication	3
CIS-1A	Introduction to Computer Information Systems	3
or		
CIS/CAT/ BUS-3	Computer Applications for Business	3
COM-1/1H	Public Speaking	3
or		
COM-9/9H	Interpersonal Communication	3
or		
MAG-57	Oral Communications	3
MAG-56	Human Resources Management	3
MAG-44	Principles of Management	3
or		
MAG-51	Elements of Supervision	3
MAG-53	Human Relations	3
MKT-20	Principles of Marketing	3
MKT-42	Retail Management	3

Associate of Science Degree
The Associate of Science Degree in Retail Management/ WAFC will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.

SIMULATION AND GAME DEVELOPMENT
See GAME DEVELOPMENT

SUPPLY CHAIN AUTOMATION (N) NAS408/NAS408B/ NAS408C/NCE408

Supply Chain Automation is a rapidly-emerging discipline that supports the automated warehousing industry. This program provides students with the skills and hands-on training needed to install, operate, support, upgrade or maintain the automated material handling equipment and systems that support the supply chain. This includes complex conveyer systems, robotics, sensors, optics, mechanical drive systems and programmable logic controllers. This certificate prepares students for employment as an electro-mechanical technicians, maintenance mechanic, maintenance technicians, or supply chain technicians.

Certificate Program
Program Learning Outcomes
Upon successful completion of this program students should be able to:

- Demonstrate troubleshooting procedures to diagnose and repair hydraulic and pneumatic systems used in automated processes and robotic assemblies.
- Demonstrate the installation, maintenance and troubleshooting of Programmable Logic Controllers systems (PLCS) and PLC modules.
- Solve arithmetic problems and formulas using unknowns that are typical to solving problems in engineering and industrial setting.

Required Courses (32-33 Units)		Units
SCT/SCA-1	Introduction to Automated Warehousing	3
ELC/ELE-73/MAN-73	Electric Motors and Transformers	4
ELC/ELE-74/MAN-74	Industrial Wiring and Controls	4
ELC/ELE/ELC-77	Electrical Theory for Electricians	3
DFT/ENE-27/ELE-27	Technical Communications	3
DFT/ENE-51	Blueprint Reading	2
ENE-62	Math for Automated Systems	3
or		
MAT-36	Trigonometry	4
MAN-55/ELE-55	OSHA Standards for General Industry	1
MAN-60	Hydraulic and Pneumatic Systems	3
ELE-64/MAN-64	Programmable Logic Controllers	3
ELE-26	Microcontrollers	3

Associate of Science Degree
The Associate of Science Degree in Supply Chain Automation will be awarded upon completion of the degree requirements, including general education and other graduation requirements as described in the college catalog.