



**Section V**  
**CURRICULAR PATTERNS**

## WORKSHOP COURSES

Each discipline of the college has the option of developing workshop courses that are specifically designated to be experimental courses. (They are developed by faculty members in the discipline and receive curriculum committee approval prior to being offered.) Workshop courses cannot be used to satisfy specific graduation requirements; however, they may be used as elective credit for the Associate degree. Courses with this designation may be periodically found in the semester schedule of classes.

## COOPERATIVE WORK EXPERIENCE EDUCATION

The purpose of the Cooperative Work Experience Education Program is to provide students with an opportunity to increase their overall knowledge of their jobs by relating classroom theory with the world of work, while exposing them to the concepts of human relations in their business and personal lives. There are two work experience programs: general and occupational.

## GENERAL WORK EXPERIENCE EDUCATION

This program provides career guidance, job information, human relations, and other similar services for employed students. These jobs do not have to be related to the student's major. The job may be salaried or volunteer, but students must have a job before the beginning of the third week of class. The student earns 3 units per semester for 180-225 hours of volunteer or paid work experience, respectively, plus weekly attendance at a one hour lecture class. Students can take two (2) semesters of general work experience for a maximum of six (6) units. Veterans wishing to earn units and VA benefits must take occupational work experience.

## OCCUPATIONAL WORK EXPERIENCE EDUCATION

Work Experience is a one hour per week class which allows students to earn up to 4 units per semester for experience gained through employment or volunteer service. Enroll in a general Work Experience section and you will be placed in your choice of one of the disciplines below.

### Units Determination:

General Work Experience (not related to one of the occupational disciplines listed below) is 3 units only.

Occupational Work Experience (one of the disciplines shown below) varies from 1-4 units. For every one (1) unit of work experience credit students must complete 75 hours of paid work or 60 hours of volunteer work during the college semester. No more than 20 hours per week may be applied toward this work requirement. Below is a general guide to help students enroll in the appropriate number of units of work experience.

Hours Worked Per Week	Students should enroll in:
20-40 (paid) 15-40 (volunteer)	up to 4 units
14-19 (paid) 11-14 (volunteer)	up to 3 units
9-13 (paid) 7-10 (volunteer)	up to 2 units
5-8 (paid) 4-6 (volunteer)	1 unit

Accounting  
 Architecture  
 Art  
 Business Administration  
 Computer Applications and Office Technology  
 Computer Information Systems

Construction Technology  
 Early Childhood Education  
 Electronics  
 Engineering  
 Kinesiology  
 Machine Shop  
 Management  
 Manufacturing  
 Marketing  
 Real Estate  
 Theater

## HIGH SCHOOL COURSES

### Foreign Languages

Two years of high school study in the same language with an earned grade of "C" or better for each course are equivalent to the first level of the same language at RCCD (for example, two years of Spanish in high school are equal to Spanish I at RCCD.)

### Chemistry

Information regarding validation of high school chemistry courses for prerequisites can be found on the Assessment webpage at [www.norcocollege.edu](http://www.norcocollege.edu).

### Articulated Courses

The Riverside Community College District (RCCD) and Secondary Education District articulation process provides a method by which college credit can be given for articulated high school and ROP courses, thereby creating a seamless transition from secondary to post-secondary education. Articulation means an agreement has been reached and the student will receive college credit for a specific high school or ROP course(s). Not all courses are articulated. Students can find the most up-to-date listing of articulated courses, correlating grade requirements, and instructions on how to receive credit by going to [www.explorecte.com/articulation](http://www.explorecte.com/articulation).

For further information or assistance, please contact the Career and Technical Education Projects office, 951-222-8963.

### ALVORD UNIFIED SCHOOL DISTRICT

Accounting Principles (CAT/ACC 55)  
 Anatomy/Physiology (AMY 10)  
 Architectural Design 1 (ARE 24)  
 CADD Computer Aided Drafting and Design (ENE 30)  
 Computer Keyboarding (CAT 53)  
 Drafting 2 (ENE 21)  
 Web Design (ADM 74)  
 Word Processing (CAT 50)

### ANTELOPE VALLEY UNION HIGH SCHOOL DISTRICT

EMT (EMS 50 & EMS 51)

### COLTON JOINT UNIFIED SCHOOL DISTRICT

Advanced Keyboarding/Computer Literacy (CAT 50)  
 Microsoft Word (CAT/CIS 34A)

### CORONA NORCO UNIFIED SCHOOL DISTRICT

Anatomy/Physiology 1A/1B (AMY 10)  
 Architecture Design 1A-1B (ARE 24 & ARE 25)  
 Auto 2A/2B (AUT 50)  
 Business Procedures (CAT 61)

Computer Aided Drafting 2A-2B (ENE 42)  
 Design Manufacturing Technology 1A & 1B (MAN 52)  
 Electronics 1A-1B (ELE 21)  
 Introduction to Engineering & Architecture 1A-1B (ENE 21 & ENE 30)  
 Photography 1A & 1B (PHO 8)  
 Technology Applications 2A/2B (CIS 1A)

#### **COLTON REDLAND YUCAIPA ROP (CRY-ROP)**

American Sign Language II (AML 1)  
 Automotive General Service Technician (AUT 50)  
 CISCO Internetworking Level 1 (CIS 26A)  
 CISCO Internetworking Level 2 (CIS 26B)  
 CISCO Internetworking Level 3 (CIS 26C)  
 CISCO Internetworking Level 4 (CIS 26D)  
 Construction Technology (CON 60)  
 Desktop Publishing & Printing (ADM 1)  
 Fundamental Webpage Design (ADM 74)  
 Microsoft Office (CAT/CIS 93)  
 The Art of Animation (ART 44)  
 Welding Occupations (WEL 15)

#### **CALIFORNIA SCHOOL FOR THE DEAF**

Construction Technology (CON 60)

#### **JURUPA UNIFIED SCHOOL DISTRICT**

Accounting 1 (CAT/ACC 55)  
 Auto 1 (AUT 50)  
 Digital Photo 1 (PHO 20)  
 Introduction to Business 1 & 2 (BUS 10)  
 Photography 1 (PHO 8)  
 Photography 2 (PHO 9)  
 Television Broadcasting (FTV 67)  
 Video Production (FTV 67)  
 Web Design (ADM 74)

#### **LAKE ELSINORE UNIFIED SCHOOL DISTRICT**

Advanced Engineering Design w/Solidworks (ENE 42)  
 Design 2 (ADM 71)  
 Manufacturing & Materials Engineering 1 (WEL 34)  
 Manufacturing & Materials Engineering 2 (WEL 35)

#### **MORENO VALLEY UNIFIED SCHOOL DISTRICT**

Advanced Engineering Drawing (ENE 31)  
 Accounting 1 (CAT/ACC 55)  
 Anatomy and Physiology (AMY 10)  
 Architecture Design (ARE 24)  
 Automotive Technology I & II (AUT 50)  
 Digital Electronics (ELE 25)  
 Engineering Drawing 1 & 2 (ENE 21)  
 Healthcare Level 1&2 (HET 79)  
 Photography 101 (PHO 8 & PHO 9)  
 Principles of Engineering (ENE 10 & ENE 60)  
 Web Design (ADM 74)

#### **MURRIETA VALLEY UNIFIED SCHOOL DISTRICT**

Automotive Technology (AUT 50)  
 Drafting 1 (ENE 21)

#### **NUVIEW UNION SCHOOL DISTRICT**

American Sign Language (AML 1)  
 Anatomy and Physiology (AMY 10)  
 Computer 1 (CAT/CIS 93)  
 Photography (PHO 20)

#### **RIVERSIDE COUNTY OFFICE OF EDUCATION CTE/ROP**

Allied Health Occupations (HET 79)  
 Auto Collision & Refinishing (AUB 50)  
 Automotive Technology (AUT 50)  
 CIS Microsoft Office Tools I (CAT/CIS 34A)  
 CIS Microsoft Office Tools II (CAT/CIS 98A)  
 Construction Technology (CON 60)  
 Digital Imaging (ADM 71)  
 Digital Photography I (PHO 20)  
 Emergency Medical Tech (EMS 50 & 51)  
 Graphics Technology (ADM 1)  
 Maintenance Mechanics (MAN 60 & MAN 61)  
 Masonry Occupations (CON 81, 82, 83, 84, 85, & 86)  
 Nurse Assistant (HET 80)  
 TV/Video Level I (FTV 67)  
 Website Design & Development (ADM 74)

#### **REDLANDS UNIFIED SCHOOL DISTRICT**

Advanced Multimedia Design #0962 (FTV 67)

#### **RIVERSIDE UNIFIED SCHOOL DISTRICT**

Advanced Digital Video Production or Media/Arts Academy III (FTV 67)  
 Advanced Web Design (ADM 74)  
 Anatomy and Physiology (AMY 10)  
 Beginning Computer Class (CAT/CIS 93)  
 CCNA 1 (CIS 26A)  
 CCNA 2 (CIS 26B)  
 Certified Nursing Assistant (HET 80)  
 Digital Electronics (ELE 25)  
 Health & Bioscience Academy I (FIT E2A)  
 Health & Bioscience Academy II (HET 79 & MDA 1A)  
 Keyboarding/Tech Tool I (CAT 50)  
 Medical Assistant Course A: Front & Back Office (MDA 54)  
 Medical Terminology (MDA 1A)  
 Principles of Engineering (ENE 10 & ENE 60)

#### **SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT**

Adobe Prep I & II (ADM 71)  
 Automotive Technology A & B (AUT 50)  
 CISCO Academy 1A (CIS 26A)  
 CISCO Academy 1B (CIS 26B)  
 CISCO Academy 2A (CIS 26C)  
 CISCO Academy 2B (CIS 26D)  
 Construction Occupations A/B (CON 60)  
 Introduction to Accounting (CAT/ACC 55)

#### **SAN BERNARDINO COUNTY SUPERINTENDENT OF SCHOOLS (SBCSS) ROP**

Computer Aided Drafting (ENE 21 & ENE 30)

#### **TEMECULA VALLEY UNIFIED SCHOOL DISTRICT**

American Sign Language 2 (AML 1)

**VAL VERDE UNIFIED SCHOOL DISTRICT**

Anatomy and Physiology (AMY 10)

Business Computers (CAT/CIS 3)

CISCO Academy 1A (CIS 26A)

CISCO Academy 1B (CIS 26B)

CISCO Academy 2A (CIS 26C)

CISCO Academy 2B (CIS 26D)

Computer Essentials (CAT/CIS 34A)

Web Page Design &amp; Development (ADM 74)

**CAREER AND TECHNICAL EDUCATION PROGRAMS**

Norco College offers Associate in Science Degrees and Certificate Programs with an occupational emphasis. Both provide instruction in skills and knowledge needed to enter a skilled or professional occupation. Associate in Science Degree programs require completion of at least 60 units of credit, which normally takes four semesters. Certificate programs, leading to an associate in science degree, require a minimum of 18 units, but vary in number of units required; most can be completed in two semesters. Certificates can lead to employment. Each course required for a certificate must be completed with a "C" grade or better. All certificate courses can be counted toward the degree as well as the major.

**Need for Specialized Training**

Many find it difficult to secure employment or to advance in current positions and better-paying jobs without specialized training. General education coursework has its value, but in the early stages of a career it is specific, technical skills employers seek. A certificate is the best evidence specialized training has been secured. At times employers actually require certificates as a condition of employment or reclassification for higher pay.

**Who Can Enroll in the Career and Technical Education Programs?**

Individuals wishing to enroll at Norco College must file an official application. Admission to Norco College is regulated by state law as prescribed in the California Education Code.

**Certificate Course Requirements**

Students should plan to enroll in the specific courses listed under the certificate desired. If a required course for a certificate program is no longer offered, please see the department chair to ascertain an acceptable course substitute. Fifty percent of the coursework required for any certificate pattern must be completed at Riverside Community College District.

**ASSOCIATE IN SCIENCE DEGREE**

The Associate of Science Degree consists of course work totaling 60 units or more. This includes coursework in a specific college certificate pattern plus general education and elective courses.


**STATE-APPROVED CERTIFICATE  
(Certificate of Achievement)**

The state-approved certificate consists of coursework totaling 18 units or more completed in a specific occupational college certificate pattern. State-approved certificates may lead to employment competency and may lead to an associate degree.

**LOCALLY-APPROVED CERTIFICATE  
(Certificate of Career Preparation)**

The locally-approved certificate consists of coursework totaling between 4 to 17 units completed in a specific occupational certificate pattern. Locally-approved certificates may lead to employment competency, but do not necessarily lead to an associate degree.



Program	Locally Approved Certificate	State Approved Certificate	Associate Degree	Moreno Valley	Norco	Riverside
<b>AREA OF EMPHASIS</b>						
Administration & Information Systems			•	MAA494	NAA494*	AA494*
American Studies			•	MAA492		AA492*
Communications, Media & Languages			•	MAA495	NAA495*	AA495*
Fine & Applied Arts			•	MAA496	NAA496*	AA496*
Humanities, Philosophy & Arts			•	MAA497	NAA497*	AA497*
Kinesiology, Health and Wellness			•	MAA498	NAA498*	AA498*
Social & Behavioral Studies			•	MAA499	NAA499*	AA499*
Math and Science			•	MAS493	NAS493	AS493*
 Associate Degree for Transfer™						
Administration of Justice						
With CSUGE pattern						AS642*
With IGETC pattern						AS643*
Communication Studies						
With CSUGE pattern			•	MAA587	NAA587	AA587
With IGETC pattern			•	MAA588	NAA588	AA588
Early Childhood Education						
With CSUGE pattern			•	MAS529	NAS529	AS529*
With IGETC pattern			•	MAS530	NAS530	AS530*
English						
With CSUGE pattern			•		NAA648	AA648
With IGETC pattern			•		NAA649	AA649
Journalism						
With CSUGE pattern			•			AA670
With IGETC pattern			•			AA671
Sociology						
With CSUGE pattern			•	MAA695	NAA695	AA695*
With IGETC pattern			•	MAA696	NAA696	AA696*
Studio Arts						
With CSUGE pattern			•		NAA693	
With IGETC pattern			•		NAA694	
Theatre Arts						
With CSUGE pattern			•			AA747
With IGETC pattern			•			AA748

\*50% or more of the certificate/degree may be completed online

Certificates and Degrees	Locally Approved Certificate	State Approved Certificate	Associate Degree	Moreno Valley	Norco	Riverside
<b>ADMINISTRATION OF JUSTICE</b>		•	•	MAS504/MCE504	NAS504/NCE504	AS504*/CE504*
AOJ/Basic Correctional Deputy Academy	•			MCE783		
AOJ/Basic Public Safety Dispatch Course	•			MCE784		
Crime Scene Investigation	•				NCE619	CE619
Investigative Assistant	•				NCE785	CE785
Law Enforcement		•	•	MAS563/MCE563		
Victim Services Aide	•					CE679*
<b>AIR CONDITIONING AND REFRIGERATION</b>		•	•			AS596/CE596
<b>APPLIED DIGITAL MEDIA AND PRINTING</b>		•	•			AS653/CE653
Basic Electronic Prepress	•					CE822
Basic Graphic Design	•					CE823
New Media and Interactive Design	•					CE821
<b>ARCHITECTURE</b>		•	•		NAS509/NCE509	
Architectural Graphics	•				NCE787	
<b>ART</b>						
Visual Communications-Animation	•					CE774
Visual Communications-Illustration	•					CE825
<b>AUTOMOTIVE TECHNOLOGY</b>						
Automotive Body Repair		•	•			AS511/CE511
Automotive Trim and Upholstery		•	•			AS516/CE516
Electrical		•	•			AS513/CE513
Ford Specialty			•			AS519
General Motors Specialty			•			AS583
Mechanical		•	•			AS515/CE515
<b>BANK OPERATIONS</b>	•					CE625*
<b>BUSINESS ADMINISTRATION</b>						
Accounting Concentration		•	•	MAS523/MCE523	NAS523/NCE523	AS523/CE523
Banking and Finance Concentration		•	•			AS631*/CE631*
General Business Concentration		•	•	MAS524/MCE524	NAS524/NCE524*	AS524*/CE524*
Human Resources Concentration		•	•		NAS623/NCE623*	AS623/CE623
Logistics Management Concentration		•	•		NAS580/NCE580*	
Management Concentration		•	•	MAS521/MCE521	NAS521/NCE521*	AS521*/CE521*
Marketing Concentration		•	•	MAS525/MCE525	NAS525/NCE525*	AS525*/CE525*
Real Estate Concentration		•	•	MAS527/MCE527	NAS527/NCE527*	AS527/CE527
Entrepreneurship		•	•			AS531*/CE531*
Insurance		•	•			AS629*/CE629*
International Business	•					CE627*
Operations and Production Mgmt	•					CE833*
Real Estate Salesperson and Transaction	•				NCE854	
<b>COMMERCIAL MUSIC</b>		•	•		NAA645/NCE645	
<b>COMMUNITY INTERPRETATION</b>		•	•	MAS557/MCE557		

\*50% or more of the certificate/degree may be completed online

For information about our graduation rates, the median debt of students who complete programs, and other important information, please visit our website at <http://www.rccd.edu/academicprograms/Pages/index.aspx>

Certificates and Degrees	Locally Approved Certificate	State Approved Certificate	Associate Degree	Moreno Valley	Norco	Riverside
<b>COMPUTER APPLICATIONS &amp; OFFICE TECHNOLOGY</b>						
Administrative Office Professional	•					CE637*
Executive Office Management		•	•			AS639*/CE639*
Executive Office Professional	•					CE635*
Legal Administrative Professional	•					CE611*
Office Assistant	•					CE633*
Office Fast-Track	•					CE812*
Virtual Assistant	•					CE677*
<b>COMPUTER INFORMATION SYSTEMS</b>						
C++ Programming	•				NCE803	CE803*
CISCO Networking	•					CE810*
Computer Applications		•	•	MAS726/MCE726	NAS726/NCE726	AS726*/CE726*
Computer Programming		•	•	MAS728/MCE728	NAS728/NCE728	AS728*/CE728*
Desktop Publishing		•	•		NAS647/NCE647*	
E-Commerce	•					CE807*
Java Programming	•				NCE809	CE809*
Mobile Application Development		•	•		NAS725/NCE725	
Relational Database Mgmt Tech	•					CE816*
Simulation and Gaming		•	•	MAS739/MCE739	NAS739/NCE739	
Systems Development	•					CE806*
Web Master-Web Designer	•			MCE820	NCE820	CE820*
Web Master-Web Developer	•			MCE843	NCE843	CE843*
<b>CONSTRUCTION TECHNOLOGY</b>						
		•	•		NAS532/NCE532	
<b>COSMETOLOGY</b>						
		•	•			AS534/CE534
Cosmetology Business Admin – Entrepreneurial Concentration		•	•			AS537*/CE537*
Cosmetology Business Admin – Mgmt and Supervision Concentration		•	•			AS535*/CE535*
Cosmetology, Instructor Training	•					CE675
Esthetician	•					CE673
<b>CULINARY ARTS</b>						
		•	•			AS561/CE561
<b>DENTAL ASSISTANT</b>						
		•	•	MAS621/MCE621		
<b>DENTAL HYGIENE</b>						
			•	MAS724		
<b>DENTAL LABORATORY TECHNOLOGY</b>						
		•	•	MAS723/MCE723		
<b>DRAFTING TECHNOLOGY</b>						
		•	•		NAS539/NCE539	
<b>EARLY CHILDHOOD EDUCATION</b>						
		•	•	MAS544/MCE544	NAS544/NCE544	AS544*/CE544*
ECE/Asst Teacher	•			MCE795	NCE795	CE795*
ECE/Twelve Core Units	•			MCE797	NCE797	CE797*
Early Childhood Intervention Asst		•	•	MAS601/MCE601	NAS601/NCE601	AS601/CE601*
Infant and Toddler Specialization	•			MCE681	NCE681	CE681
<b>EDUCATION PARAPROFESSIONAL</b>						
		•	•	MAS603/MCE603*		AS603*/CE603*

\*50% or more of the certificate/degree may be completed online

For information about our graduation rates, the median debt of students who complete programs, and other important information, please visit our website at <http://www.rccd.edu/academicprograms/Pages/index.aspx>



Certificates and Degrees	Locally Approved Certificate	State Approved Certificate	Associate Degree	Moreno Valley	Norco	Riverside
<b>ELECTRONICS TECHNOLOGY</b>						
Digital Electronics		•	•		NAS656/NCE656	
Electronics Technology		•	•		NAS546/NCE546	
Green Technician	•				NCE856	
<b>EMERGENCY MEDICAL SERVICES</b>						
Emergency Medical Technician	•			MCE801		
Paramedic		•	•	MAS585/MCE585		
<b>ENGINEERING</b>						
Civil Engineering Technician		•	•		NAS550/NCE550	
Engineering Graphics	•				NCE796	
Engineering Technology			•		NAS551	
<b>FILM, TELEVISION AND VIDEO</b>						
Basic Television Production	•					CE842
Production Specialist		•	•			AS641/CE641
<b>FIRE TECHNOLOGY</b>		•	•	MAS555/MCE555		
Chief Officer		•	•	MAS826/MCE826		
Fire Officer		•	•	MAS827/MCE827		
Firefighter Academy		•	•	MAS669/MCE669		
<b>HUMAN SERVICES</b>		•	•	MAS663/MCE663		AS663/CE663
Employment Support Specialization	•			MCE802		CE802
<b>KINESIOLOGY/EXERCISE, SPORT &amp; WELLNESS</b>						
Athletic Training Emphasis		•	•			AS597/CE597
Coaching Emphasis		•	•			AS599/CE599
Fitness Professions Emphasis		•	•			AS595/CE595
<b>LOGISTICS MANAGEMENT</b>		•	•		NAS579/NCE579	
<b>MANUFACTURING TECHNOLOGY</b>						
Automated Systems Technician		•	•		NAS737/NCE737	
Computer-Aided Production Technology	•				NCE799	
Computer Numerical Control Programming		•	•		NAS655/NCE655	
<b>MEDICAL ASSISTING</b>						
Admin/Clinical Medical Assisting		•	•	MAS718/MCE718		
Medical Transcription		•	•	MAS701/MCE701		
<b>MUSIC</b>			•	MAA564		AA680
Jazz Performance	•					CE852
Music Performance	•					CE851
Music Technology	•					CE850
Piano Performance	•					CE853
<b>NURSING</b>						
Critical Care Nurse	•					CE581
Nursing Assistant	•					CE584
Registered Nursing			•			AS586
Vocational Nursing		•	•			AS588/CE588
<b>PARALEGAL STUDIES</b>			•			AS591*

\*50% or more of the certificate/degree may be completed online

For information about our graduation rates, the median debt of students who complete programs, and other important information, please visit our website at

<http://www.rccd.edu/academicprograms/Pages/index.aspx>



Certificates and Degrees	Locally Approved Certificate	State Approved Certificate	Associate Degree	Moreno Valley	Norco	Riverside
PHOTOGRAPHY		•	•			AS592/CE592
PHYSICIAN ASSISTANT		•	•	MAS501/MCE501		
RETAIL MANAGEMENT/WAFC		•	•		NAS536/NCE536	AS536*/CE536*
SIGN LANGUAGE INTERPRETING		•	•			AS505/CE505
<b>SIMULATION AND GAME DEVELOPMENT</b>						
Game Art: 3D Animation		•	•		NAS686/NCE686	
Game Art: Character Modeling		•	•		NAS687/NCE687	
Game Art: Environments and Vehicles		•	•		NAS688/NCE688	
Game Art Core	•				NCE855	
Game Audio		•	•		NAS684/NCE684	
Game Design		•	•		NAS685/NCE685	
Game Programming		•	•		NAS691/NCE691	
<b>SPEECH LANGUAGE PATHOLOGY ASSISTANT</b>		•	•	MAS697/MCE697		
<b>SUPPLY CHAIN TECHNOLOGY</b>		•	•		NAS608/NCE608	
<b>WELDING TECHNOLOGY</b>		•	•			AS606/CE606
Stick Welding (SMAW)	•					CE824
TIG Welding (GTAW)	•					CE819
Wire Welding (FCAW, GMAW)	•					CE818

\*50% or more of the certificate/degree may be completed online

Location	Program & Program Code	Locally Approved Certificate	State Approved Certificate	Associate Degree
<b>MORENO VALLEY COLLEGE</b>				
Ben Clark Training Center				
	Administration of Justice MAS504/MCE504		•	•
	AOJ/Basic Correctional Deputy Academy MCE783	•		
	AOJ/Basic Public Safety Dispatch Course MCE784	•		
	Law Enforcement MAS563/MCE563		•	•
	Emergency Medical Technician MCE801	•		
	Paramedic MAS585/MCE585		•	•
	Fire Technology MAS555/MCE555		•	•
	Chief Officer MAS826/MCE826		•	•
	Fire Officer MAS827/MCE827		•	•
	Firefighter Academy MAS669/MCE669		•	•

For information about our graduation rates, the median debt of students who complete programs, and other important information, please visit our website at <http://www.rccd.edu/academicprograms/Pages/index.aspx>

**PROGRAMS AND CERTIFICATES**

R=Riverside; M=Moreno Valley; N=Norco

**ACCOUNTING**See [BUSINESS ADMINISTRATION](#)**ADMINISTRATION OF JUSTICE****ADMINISTRATION OF JUSTICE (MNR) NAS504/NCE504**

This program focuses on the criminal justice system, its organizational components and processes, as well as its legal and public policy contexts. This includes instruction in criminal law and policy, police and correction systems organization, the administration of justice and the judiciary, and public attitudes regarding criminal justice issues.

**Certificate Program****Program Learning Outcomes**

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

- Demonstrate knowledge of the breadth, scope and interconnectivity of the criminal justice system.
- Demonstrate an understanding of the theories and research in the area of crime, criminality and criminal justice.
- Demonstrate a basic knowledge of criminal law.
- Demonstrate a knowledge of the implications of legal evidence in the processing of criminal cases.
- Demonstrate a knowledge of the role of policing and the maintenance of favorable community relations.

Required Courses (27 units)		Units
ADJ-1	Introduction to the Administration of Justice	3
ADJ-2	Principles and Procedures of the Justice System	3
ADJ-3	Concepts of Criminal Law	3
ADJ-4	Legal Aspects of Evidence	3
ADJ-5	Community Relations	3
Electives	Choose from elective courses in the discipline	12

**Associate in Science Degree**

The Associate in Science Degree in Administration of Justice 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 in Science Degree:*

**CRIME SCENE INVESTIGATION (NR) NCE619**

This certificate is designed to offer a basic pattern of course work 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

**INVESTIGATIVE ASSISTANT (NR) NCE785**

This certificate is designed to offer a basic pattern of course work that will prepare the participant to enter the professional field of criminal investigation and forensic science at the assistant level. The successful participant will gain sufficient skills and understanding of the criminal investigative procedure to assist professionals in all areas of the criminal justice system to properly gather, analyze, prepare, and present evidence in criminal matters, e.g., Police, District Attorneys, and courts.

**Certificate Program****Program Learning Outcomes**

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

- Demonstrate a basic knowledge of the principle components of criminal law and the criminal justice system.
- Demonstrate a basic knowledge of the procedures and process of collecting, preserving, and cataloging physical evidence from a crime scene.
- Demonstrate the ability to properly write official reports related to the collection, preservation, and presentation of crime scene evidence.
- Demonstrate the ability to employ computer technology to facilitate student learning outcomes 1 through 3 above.

Required Courses (15 units)		Units
ADJ-3	Concepts of Criminal Law	3
ADJ-4	Legal Aspects of Evidence	3

ADJ-13	Criminal Investigation	3
ADJ-23	Criminal Justice Report Writing <sup>1</sup>	3
CIS-1A	Introduction to Computer Information Systems	3

<sup>1</sup> Successful completion of ENG-1A may substitute for this course.

## ARCHITECTURE

### ARCHITECTURE (N) NAS509/NCE509

This program prepares individuals to apply technical knowledge and skills to develop working drawings and electronic simulations for architectural and related construction projects. This includes instruction in basic construction and structural design, architectural rendering, architectural-aided drafting (CAD), layout and designs, architectural industrial print interpretation, building materials, and basic structural wiring diagramming. Students completing this certificate will be qualified for an entry level architectural drafting position.

#### Certificate Program

##### Program Learning Outcomes

Upon successful completion of this program should be able to demonstrate:

- An ability to apply and integrate computer technology in the design process exhibiting skills necessary for entry-level employment in the architecture profession.
- Knowledge of architecture theory, and practice in the solution of Architectural design problems related to industry.
- An ability to work effectively in small and large group situations similar to those found in industry.
- The ability to apply the problem solving process to create and present design solutions.

Required Courses (27 units)	Units
ARE-24 Architectural Drafting	3
ARE-25 Advanced Architectural Drafting	3
ARE-26 Architectural Rendering	3
ARE-35 History of Architecture-Beginnings of Architecture through Gothic Architecture	3
or	
ARE-36 History of Architecture-Renaissance through the 20th Century	3
ARE-37 Architectural Design I	3
or	
ART-22 Basic Design	3
ENE-21 Drafting	3
ENE-30 Computer-Aided Drafting (CAD)	3
ENE-60 Math for Engineering Technology	3
Electives (Choose from list below)	3

Electives (3 units)		
ART-17	Beginning Drawing	3
ART-23	Design and Color	3
ART-24	Three Dimensional Design	3
CON-60	Introduction to Construction	3
CON-61	Materials of Construction	3
ENE-26	Civil Engineering Drafting	3
ENE/ELE-27	Technical Communication	3

#### Associate in Science Degree

The Associate in Science Degree in Architecture 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 architecture certificate program, students who complete the Associate in Science Degree in Architecture will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

*The following certificate may lead to employment competency, but does not lead to an Associate in 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	3

## 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
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
Human Resources	12
Logistics Management	12
Management	12
Marketing	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 in Science Degree

The Associate in 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 **NAS523/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

#### GENERAL BUSINESS CONCENTRATION (MNR) **NAS524/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
<hr/>	
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

**HUMAN RESOURCES CONCENTRATION (MNR) NAS623/NCE623**

This program prepares individuals to manage the development of human capital in an organization, and to provide related services to individuals and groups. This includes instruction in personnel and organization policy, human resources dynamics and flows, labor relations, sex roles, civil rights, human resources law and regulations, motivation and compensation systems, work systems, career management, employee testing and assessment, recruitment and selection, managing employee and job training programs, and the management of human resources programs and operations.

**Program Learning Outcomes**

In addition to outcomes for the Business Administration certificate, on successful completion of the Human Resources Management concentration, students should be able to:

- Apply sound human resources management practices.
- Identify, describe and analyze the role of training and development, along with key influences that impact this function within human resources management.
- Describe and analyze the role of employee labor relations in human resources management, along with key influences impacting labor relations today.
- Understand the role that Human Resources Management plays in the successful operations of a business or organization.
- Analyze and explain various human resources laws and policies required for a professional in the field to know and understand.

Business Administration Major Core Requirements	18
Required for this concentration	3
<hr/>	
MAG-56 Human Resources Management	3
and	
Select another 9 units from the following:	9
<hr/>	
MAG-51 Elements of Supervision	3
MAG-52 Employee Training and Development	3
MAG-54 Employee Labor Relations	3
MAG/BUS-70 Introduction to Organizational Behavior	3

**LOGISTICS MANAGEMENT CONCENTRATION (N) NAS580/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
<hr/>	
BUS-80 Principles of Logistics	3
and	
Select another 9 units from the following:	9
<hr/>	
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

**MANAGEMENT CONCENTRATION (MNR) NAS521/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
<hr/>	
MAG-44 Principles of Management	3
and	
Select another 9 units from the following:	9
<hr/>	
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

#### MARKETING CONCENTRATION (MNR) NAS525/NCE525

This program prepares individuals to undertake and manage the process of developing both consumer and business markets, and communicating product benefits to targeted market segments. This includes instruction in buyer behavior and dynamics, sales promotions, building customer relationships, effective pricing, marketing campaigns, principles of marketing research, strategic market planning, advertising methods, customer service, retailing, and applications for specific products and markets.

#### Program Learning Outcomes

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

- Develop and implement marketing strategies.
- Develop a comprehensive marketing plan.
- Construct and implement a promotional program.
- Research and analyze consumer decision parameters.

Business Administration Major Core Requirements	18
Required for this concentration	3
<hr/>	
MKT-20 Principles of Marketing	3
and	
Select another 9 units from the following:	9
<hr/>	
MKT-40 Advertising	3
MKT-41 Techniques of Selling	3
MKT-42 Retail Management	3
MKT-200 Marketing Work Experience	1-2-3-4
BUS-43 International Business-Marketing	3
BUS-51 Principles of Electronic-Commerce	3
BUS-80 Principles of Logistics	3

#### REAL ESTATE CONCENTRATION (MNR) NAS527/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 perspective 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
<hr/>	
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 in Science Degree:*

#### 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

### COMMERCIAL MUSIC

#### PERFORMANCE (N)

#### NAA645/NCE645

The *Commercial Music: Performance* certificate is a program 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 music technology and record in a state-of-the-art 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 instrumentalists and vocalists in studio or live performance settings.

#### Certificate Program

#### Program Learning Outcomes

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

- Understand and employ fundamentals of music and musicianship such as melody, harmony, chord structure, rhythm, key signatures, phrasing, sight-singing and scalar patterns.
- Identify and discuss the origins of commercial music and explain how it relates to society today.
- Create and manipulate vocal or instrumental technique in a studio and live performance setting such as fingerings, dynamics, diction, breathing, rhythm, phrasing and vowel or finger placement.
- Memorize and recall standard commercial music literature in a live ensemble performance.

Required Courses (34-36 units)		Units
MUC-1A	Beginning Performance Techniques for Studio Recording	2
MUC-1B	Intermediate Performance Techniques for Studio Recording	2
MUC-1C	Advanced Performance Techniques for Studio Recording	2
MUC-7	Introduction to Music Technology	3
MUS-3	Fundamentals of Music	4
MUS-32A	Class Piano I	1

MUS-38	Beginning Applied Music Training (take 4 times/2 units)	8
MUS-65	Basic Musicianship	2
Electives (choose from the lists below)		10-12

Select 6-8 units from the following:

MUC-3	Introduction to Pro Tools: MIDI and Audio Production	3
MUS-4	Music Theory I	4
MUS-5	Music Theory II	4
MUS-19	Music Appreciation	3
MUS-23	History of Rock and Roll	3
MUS-93	The Business of Music	3

Select 4 units from the following:

MUC-10	Norco Choir	2
MUC-11	Studio Arts Ensemble	2

#### Associate in Arts Degree

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

#### GAME AUDIO

See [SIMULATION AND GAME DEVELOPMENT](#)

### 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 APPLICATIONS (MNR)

#### NAS726/NCE726

This program prepares individuals to perform basic data and text entry using standard and customized software products. This includes instruction in keyboarding skills, personal computer and work station operation, reading draft texts and raw data forms, and various interactive software programs used for tasks such as word processing, spreadsheets, databases, and others.

#### Certificate Program

#### Program Learning Outcomes

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

- Describe and use operating system software
- Describe and use Word processing software.
- Write structured programs using C++, or Java.
- Describe and use graphics software to manipulate digital images.
- Describe and use database software to construct 3NF databases.
- Construct a visually appealing web site including database structures within the design.
- Design and use spreadsheets that have embedded equations/formulas utilizing different data types.



Required Courses (31.5-32.5 units)		Units
CIS-1A	Introduction to Computer Information Systems	3
CIS-1B	Advanced Concepts in Computer Information Systems	3
CIS/CSC-5	Programming Concepts and Methodology I: C++	4
or		
CIS/CSC-28A	MS Access Programming	3
CIS/CSC-21	Introduction to Operating Systems	3
CIS-95A	Introduction to the Internet	1.5
CAT-31	Business Communications	3
or		
BUS-22	Management Communications	3
Electives 1	(Choose from list below)	7.5
Electives 2	(Choose from list below)	7.5

#### Electives 1 (7.5 units)

CIS/CSC-2	Fundamentals of Systems Analysis	3
CIS-23	Software and End User Support	3
CIS/CSC-25	Data Communications	3
CIS/CSC-61	Introduction to Databases	3
CIS/CAT-80	Word Processing: Microsoft Word for Windows	3
CIS/CAT-84	Word Processing: WordPerfect for Windows	3
CIS/CAT-98B	Advanced Excel	1.5

#### Electives 2 (7.5 units)

CIS/CSC-12	PHP Dynamic Web Site Programming	3
CIS/CSC-14A	Web Programming: Java Script	3
CIS-14B	Web Programming: Active Server Pages	3
CIS/CAT-54A	Introduction to Flash	3
CIS-56A	Designing Web Graphics	3
CIS-72A	Introduction to Web Page Creation	1.5
CIS-72B	Intermediate Web Page Creation using Cascading Style Sheets (CSS)	1.5
CIS-76A	Introduction to Microsoft Expression Web	3
CIS-76B	Introduction to DreamWeaver	3
CIS/CAT-78A	Introduction to Adobe PhotoShop	3
CIS/CAT-79	Introduction to Adobe Illustrator	3
CIS/CAT-81	Introduction to Desktop Publishing using Adobe InDesign	3

#### Associate in Science Degree

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

#### COMPUTER PROGRAMMING (MNR) NAS728/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)

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/CSC-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/CSC-17B	C++ Programming: Advanced Objects	3
CIS/CSC-17C	C++ Programming: Data Structures	3
CIS/CSC-18B	Java Programming: Advanced Objects	3
CIS/CSC-18C	Java Programming: Data Structures	3

#### Associate in Science Degree

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

**DESKTOP PUBLISHING (N) NAS647/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;
- 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 (18 units)		Units
CIS/CAT-78A	Introduction to Adobe Photoshop	3
CIS/CAT-78B	Advanced Adobe Photoshop	3
CIS/CAT-79	Introduction to Adobe Illustrator	3
CIS/CAT-81	Introduction Adobe InDesign	3
ART-22	Basic Design	3
ART-39	Design and Graphics	3

**Associate in Science Degree**

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

**MOBILE APPLICATION DEVELOPMENT (N) NAS725/NCE725**

Students completing the Mobile Application Development Certificate or A.S. degree will be well qualified in the mobile application design and development process, including building mockups and wireframes, interfacing with standard frameworks and technologies, utilizing modern mobile hardware, and employing standard design and development techniques and tools for rapid prototyping. The final course of this program is a capstone project where students work in teams to create complete, original applications which are ready to publish. Students will complete the program with a polished portfolio and be prepared to enter the workforce as an independent mobile application designer, web designer, web programmer, or junior user experience specialist.

**Certificate Program**

**Program Learning Outcomes**

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

- Apply the principles of mobile design to create intuitive, well formatted and platform optimized mobile user interfaces.

- Apply the principles of mobile application to engineer quality, functional solutions that stress mobility, usability, flexibility, and extensibility.
- Create comprehensive mobile and web designs complete with wireframes, flow charts, and use-case diagrams 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 in an industry standard production project.
- Create an industry standard portfolio containing mobile and web application projects and documents developed in class projects.

Required Courses (30 units)		Units
CIS/CSC-5	Fundamentals of Programming Logic Using C++	4
CIS/CSC-18A	Java Programming: Objects	3
CIS/CSC-18B	Java Programming: Advanced Objects	3
CIS-66	Web Development I	3
CIS-67	Web Development II	3
CIS-68	Mobile Applications Development I	3
CIS-69	Mobile Applications Development II	3
CIS-74	Digital Design I	3
CIS-75	Digital Design II	3
GAM-44	Portfolio Production	2

**Associate in Science Degree**

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

**SIMULATION AND GAMING: GAME ART (MN) NAS739/NCE739**

This is a comprehensive program that puts equal emphasis on the artistic and technical sides of 3D modeling and animation. Courses cover material that will take the student through the whole production process and workflow of 3D modeling and animation, from conceptualization to the final delivery of the rendered product. Curriculum spans traditional drawing techniques, life drawing and the technical fundamentals of 3D animation and modeling. Classes are taught in a state-of-the-art computer studio with the latest versions of industry-standard software packages.

**Certificate Program**

**Program Learning Outcomes**

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

- Identify and differentiate the game development project lifecycle and associated documents such as the Pitch Document, Game Design Document, Technical Design Document, Art Production Plan, Project Plan and Game Prototype.
- Identify and employ proper use of color media and associated materials as well as define, outline, and discuss basic to complex color theory for 2D artwork.
- Create, manipulate, animate, and implement 3D art assets for real time interactive simulations or video games.

Required Courses (36 units)		Units
CIS-35	Introduction to Simulation and Game Development	3
or		
GAM-35	Introduction to Simulation and Game Development	3
CIS/GAM-38A	Simulation and Gaming/3D Modeling	4
CIS/GAM-38B	Simulation and Gaming/3D Animation	4
CIS/GAM-38C	Simulation and Gaming/3D Dynamics and Rendering	4
CIS/CAT-78A	Introduction to Adobe Photoshop	3
ART-17	Beginning Drawing	3
ART-18	Intermediate Drawing	3
ART-22	Basic Design	3
ART-40	Figure Drawing	3
Electives	(Choose from list below)	6

#### Electives (6 units)

CIS-36	Introduction to Computer Game Design	3
CIS/GAM-37	Beginning Level Design for Computer Games	3
CIS/GAM-39	Current Techniques in Game Art	4
CIS/CAT-54A	Introduction to Flash	3
CIS/CAT-79	Introduction to Adobe Illustrator	3
ART-23	Design and Color	3
ART-36	Computer Art	3
ART-44A	Beginning Animation Principles	3

#### Associate in Science Degree

The Associate in Science Degree in Simulation and Gaming: Game Art 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 in Science Degree:*

#### 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)

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/CSC-17B	C++ Programming: Advanced Objects	3
CIS/CSC-17C	C++ Programming: Data Structures	3

#### 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)

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

#### WEB MASTER (MNR)

The Web Master certificate program prepares a student to be a valuable member of a professional web design or development team. The successful student will become a competent HTML and CSS coder, and be proficient enough in Dreamweaver to streamline the development cycle and effectively integrate all the typical technologies within a web site. Depending on the chosen emphasis, the student will also become more skilled at designing sites with web graphics and animation or more skilled at developing web applications with programming in Javascript and PHP.

#### Certificate Program

##### Core Program Learning Outcomes

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

- Create valid, properly structured web pages using a variety of HTML features to form a typical 5-10 page site.
- Create external style sheets that effectively control an entire web site's formatting and layout.



- Use a variety of Dreamweaver features to design, create, test, upload and manage an accessible and standards compliant interactive web site that includes the use of text, graphics, and multimedia.

Required Courses (17 units)		Units
Core Requirements (6 units)		
CIS-72A	Introduction to Web Page Creation	1.5
CIS-72B	Intermediate Web Page Creation using Cascading Style Sheets (CSS)	1.5
CIS-76B	Introduction to DreamWeaver	3
or		
ADM-74	Dreamweaver for Graphic Designers	3
In addition, choose one of the concentrations below		11

**WEB DESIGNER CONCENTRATION NCE820**

**Concentration Program Learning Outcomes**

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

- Apply design and visual communication principles to web site, page, and interface design.
- Use Photoshop to create and edit images for use on the web, including photographs, logos, navigation buttons, background images, image maps, and web page design mockups (tracing images).
- Use Flash to create web animations and interactive web sites.

Concentration Required Courses (11 units)		Units
CIS/CAT-54A	Introduction to Flash	3
or		
ADM-67	WEB Animation with Flash	3
and		
CIS-56A	Designing Web Graphics	3
or		
CIS-CAT-78A	Introduction to Adobe Photoshop	3
or		
ADM-71	Adobe Photoshop	3
Electives	Choose from the list below	5

**Concentration Electives (5 units)**

CIS/CAT-81	Introduction to Desktop Publishing using Adobe InDesign	3
or		
ADM-63	Adobe InDesign	3
CIS/CAT-79	Introduction to Adobe Illustrator	3
or		
ADM-77A	Adobe Illustrator	3
ADM-64	Ethics and Legalities of Digital Manipulation	1
ADM-65	Cross Platform File Management	1
ADM-89	Applied Digital Media Portfolio	1

**WEB DEVELOPER CONCENTRATION**

**NCE843**

**Concentration Program Learning Outcomes**

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

- Apply programming principles to develop a fully functioning and customized web site experience for both the site user and site administrator.
- Use JavaScript to enhance a web site's interactivity using the DOM.
- Use PHP to enhance a web site's capabilities by creating data driven web page content, custom form validation and processing, and database manipulation.

Concentration Required Courses (11 units)		Units
CIS/CSC-12	PHP Dynamic Web Site Programming	3
CIS/CSC-14A	Web Programming: Java Script	3
Electives	(Choose from the list below)	5

**Concentration Electives (5 units)**

CIS-56A	Designing Web Graphics	3
or		
CIS/CAT-78A	Introduction to Adobe Photoshop	3
or		
ADM-71	Adobe Photoshop	3
CIS/CAT-54A	Introduction to Flash	3
or		
ADM-67	Web Animation with Flash	3
CIS-54B	Flash Scripting	3
CIS-72C	Introduction to XML	1.5
ADM-64	Ethics and Legalities of Digital Manipulation	1
ADM-65	Cross Platform File Management	1
ADM-89	Applied Digital Media Portfolio	1

## 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/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.

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 in Science Degree

The Associate in 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.

#### Program Learning Outcomes

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

## 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/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.

Required Courses (24-26 units)		Units
ENE-21	Drafting	3
ENE-22	Engineering Drawing	3
ENE-28	Technical Design	3
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
Electives	(Choose from list below)	2-4

#### Electives (2-4 units)

ARE-24	Architectural Drafting	3
ENE-23	Descriptive Geometry	3
ENE-26	Civil Engineering Drafting	3
ELE/ENE-27	Technical Communication	3
ENE-42B	SolidWorks II	3
MAN-56	CNC Machine Set-Up and Operation	4
WEL-34	Metal Joining Processes	2

#### Associate in Science Degree

The Associate in 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.

#### Program Learning Outcomes

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

**EARLY CHILDHOOD EDUCATION**

This program focuses on the theory and practice of learning and teaching children from birth to age eight; the basic principles of educational and developmental psychology; the art of observing, teaching and guiding young children; planning and administration of developmentally appropriate inclusive educational activities; school safety and health issues; and the social and emotional foundations of early care and education.

**EARLY CHILDHOOD EDUCATION (MNR) NAS544/NCE544**

This program provides an educational and practical foundation for students interested in working with children from infancy to 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. As students progress through the program they fulfill required coursework for the California Child Development permit and for the Early Childhood education/Assistant certificate, and Early Childhood Education 12 Core Units certificate.

**Certificate Program**

**Program Learning Outcomes**

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

- Use observation to assess child development, curriculum success, an environmental standards of quality, and then implement program adjustments based on assessment outcomes.
- Identify the patterns of development for children ages zero to three in the areas of physical, cognitive and psychosocial domains.
- Understand and implement health and safety practices in environmental concerns and in individual child cleansing and feeding routines.
- Create and maintain an environment of care and learning specific to young infants and newly mobile children.
- Select equipment and materials conducive to the physical, cognitive and psychosocial needs of infants and toddlers.
- Plan and implement a curriculum based on a blend of routine and play activities.

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-31	Home Visiting	3
EAR-33	Caring for Infants and Toddlers in Group Settings	3
EAR-34	Curriculum Activities for Infants and Toddlers	3
EAR-37	School Age Child Care	3
EAR-38	Adult Supervision in ECE/CD Classrooms	3
EAR-40	Introduction to Infants and Children with Disabilities and Other Special Needs	3
EAR-41	Internship in Early Intervention/Special Education	4
EAR-43	Children with Challenging Behaviors	3
EAR-44	Administration Of Early Childhood Programs I	3
EAR-45	Administration Of Early Childhood Programs II	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
EDU-3	Introduction to Literacy Instruction	3
EDU-4	Introduction to Literacy/Service Learning	1
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
SOC-45	Childhood and Culture	3

**Child Development Permit**

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 in 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.

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 [www.academic.rcc.edu/earlychild/permit.jsp](http://www.academic.rcc.edu/earlychild/permit.jsp)

**Associate in Science Degree**

The Associate in 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/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 in 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.academic.rcc.edu/earlychild/permit.jsp](http://www.academic.rcc.edu/earlychild/permit.jsp).

**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 (31 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-33	Caring for Infants and Toddlers in Group Settings	3
EAR-40	Introduction to Infants and Children with Disabilities and Other 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
Electives	(Choose from list below)	6

**Electives (6 units)**

EAR-19	Observation and Assessment in Early Childhood Education	3
EAR-26	Health, Safety and Nutrition	3
EAR-31	Home Visiting	3
EAR-34	Curriculum Activities for Infants and Toddlers	3
EAR-38	Adult Supervision in ECE/CD Classrooms	3
EAR-44	Administration Of Early Childhood Programs I	3
EAR-47	Childhood Stress and Trauma	3

**Associate in Science Degree**

The Associate in 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 in Science Degree:*

**EARLY CHILDHOOD EDUCATION ASSISTANT TEACHER (MNR)****NCE795****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 twelve 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

**INFANT AND TODDLER SPECIALIZATION (MNR)**

**NCE681**

The Infant and Toddler Specialization certificate represents a composite of child development knowledge, skills, and responsibilities integral to working with children ages zero to three. Specific courses emphasize a responsive approach to the care and education of infants and toddlers in center-based programs and family child care homes.

**Certificate Program**

**Program Learning Outcomes**

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

- Identify the patterns of development for children ages zero to three in the areas of the physical, cognitive and psychosocial domains.
- Understand and implement health and safety practices in environmental concerns and in individual child cleansing and feeding routines.
- Create and maintain an environment of care and learning specific to young infants and newly mobile children.
- Select equipment and materials conducive to the physical, cognitive and psychosocial needs of infants and toddlers.
- Plan and implement a curriculum based on a blend of routine and play activities.
- Use observation to assess child development, curriculum success, and environmental standards of quality, and then implement program adjustments based on assessment outcomes.

Required Courses (12 units)		Units
EAR-20	Child Development	3
EAR-33	Caring for Infants and Toddlers in Group Settings	3
EAR-34	Curriculum Activities for Infants and Toddlers	3
EAR-35	Internship in Infant and Toddler Care	3

**ELECTRONICS TECHNOLOGY**

**DIGITAL ELECTRONICS (N)**

**NAS656/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 & 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 in 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 & 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
ELE-11	DC (Direct Current) Electronics	4
ELE-13	AC (Alternating Current) Electronics	4
ELE-25	Digital Techniques	4
ELE-26	Microprocessors and Microcontrollers	4
ENE/ELE-27	Technical Communications	3
ELE-28	MultiSim CAD & PCB Design/Fab	3
Electives	Choose from the list below	7

Electives (7 units)		Units
ELE-10	Survey of Electronics	4
ELE-23	Electronic Devices and Circuits	4
ELE/MAN-61	Introduction to Robotics	3
ELE/MAN-63	LabView Visual Programming for Automated Systems	3
ELE/MAN-64	Programmable Logic Controllers	3

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	2

### Associate in Science Degree

The Associate in 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.

### ELECTRONICS TECHNOLOGY (N) NAS546/NCE546

This program prepares individuals to apply basic engineering principles and technical skills in support of electrical, electronics, and communication engineers. Includes instruction in electrical circuitry, prototype development and testing; systems analysis and testing, systems maintenance, instrument calibration, and report preparation.

#### Certificate Program

##### Program Learning Outcomes

Students will demonstrate proficiency sufficient to apply for and obtain entry-level employment in the field of electronics technology by completing a design and construction project that utilizes analog power and signal processing circuitry, as well as digital hardware and software, to perform specific tasks according to a project framework. As part of this project, students will include wireless, bidirectional communications, proper selection and use of measurement equipment, good test procedures, circuit analysis, simulation tools and troubleshooting techniques.

Required Courses (28 units)		Units
ELE-21	DC-AC Electronics	4
ELE-23	Electronics Devices and Circuits	4
ELE-25	Digital Techniques	4
ELE-26	Microprocessors and Microcontrollers	4
ELE/ENE-27	Technical Communication	3
Electives	(Choose from list below)	9

#### Electives (9 units)

CIS/CSC-5	Programming Concepts and Methodology I: C++	4
CIS/CSC-17A	Programming Concepts and Methodology II: C++	3
CIS/CSC-17B	C++ Programming: Advanced Objects	3
ELE-22	Passive Circuit Analysis	3
ELE-24	Active Circuit Analysis	3
ELE-36	Advanced Microprocessors	4
ELE-38	Computer Systems Troubleshooting	4
ELE-39	PCM and Digital Transmissions	3
ELE-40	Fiber Optic Basics	3
ELE-200	Electronics Work Experience	1-4
ENE-22	Engineering Drawing	3
ENE-31	Computer-Aided Drafting and Design	3
ENE-60	Math for Engineering Technology	3
MAN-60	Hydraulic and Pneumatic Systems	3
MAN-75A	Robotic Systems	4

### Associate in Science Degree

The Associate in Science Degree in Electronics Technology 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 electronics technology certificate program, students who complete the Associate in Science Degree in Electronics Technology will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

*The following certificates may lead to employment competency, but do not lead to an Associate in 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 (13 units)		Units
ELE-11	DC Electronics	4
ELE-13	AC Electronics	4
ELE-91	Fundamentals of Solar Energy	3
MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	2

**ENGINEERING TECHNOLOGY**

This program generally prepares individuals to apply basic engineering principles and technical skills in support of engineers engaged in a wide variety of projects. This includes instruction in various engineering support functions for research, production, and operation, and application to specific engineering specialties. This discipline focuses on Engineering Technology, Mechanical Engineering and Civil Engineering (Engineering Technicians).

**CIVIL ENGINEERING TECHNICIAN (N) NAS550/NCE550 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, such as Computer-Aided Drafting (CAD) and total station, in the field of civil engineering to qualify for entry-level position as a land surveyor and/or CAD technician.
- An ability to apply the problem solving process to create and present design solutions.

**Required Courses (27 units) Units**

ENE-1A	Plane Surveying I	3
ENE-1B	Plane Surveying II	3
ENE-21	Drafting	3
ENE-22	Engineering Drawing	3
ENE-30	Computer-Aided Drafting (CAD)	3
MAT-35	Intermediate Algebra	5
MAT-36	Trigonometry	4
Electives	(Choose from list below)	3

**Electives (3 units)**

ARE-24	Architectural Drafting	3
ENE-23	Descriptive Geometry	3
ENE-26	Civil Engineering Drafting	3
ENE-31	Computer-Aided Drafting and Design	3

**Associate in Science Degree**

The Associate in Science Degree in Engineering Technician 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 engineering technician certificate program, students who complete the Associate in Science Degree in Engineering Technician will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

**ENGINEERING TECHNOLOGY (N) NAS551**

**Associate in Science Degree**

**Program Learning Outcomes**

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

- An ability to integrate computer technology in the field of Engineering Technology at a sufficient level for entry-level employment.
- Knowledge of engineering principles necessary for transfer to a four-year engineering institution.
- An ability to apply the problem solving process to create and present design solutions.

**Required Courses (32-34 units) Units**

ENE-21	Drafting	3
ENE-22	Engineering Drawing	3
ENE/ELE-27	Technical Communication	3
ENE-30	Computer Aided Drafting (CAD)	3
ELE-21	DC-AC Electronics	4
MAT-11	College Algebra	4
MAT-36	Trigonometry	4
WEL-34	Metal Joining Processes	2
Electives	(Choose from list below)	6-8

**Electives (6-8 units)**

CHE-2A	Introductory Chemistry I	4
ENE-23	Descriptive Geometry	3
MAT-5	Calculus, A Short Course	4
MAT-12	Statistics	3
PHY-2A	General Physics I	4

**Associate in Science Degree**

The Associate in Science Degree in Engineering Technology 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**

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

Students who complete the Associate in Science Degree in Engineering Technology will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

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

**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

**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/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

**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.

**Program Learning Outcomes**

In addition to achieving the program learning outcome for the logistics management certificate program, students who complete the Associate in 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.

**AUTOMATED SYSTEMS TECHNICIAN (N) NAS737/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 Automated Systems Technician program teaches how to use Electronics, Microprocessors, Microcontrollers, Programmable Logic Control and Fluid Power systems to create and program new machinery used in industry. Students completing this certificate are prepared for entry-level employment as Avionics Technicians, Maintenance Technician, Automation Technicians, and Electromechanical Systems Technician.

**Certificate Program**

**Program Learning Outcomes**

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

- Discuss and demonstrate occupation safety and technical communications.
- 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.
- Establish a systematic approach to recognizing the essential information given on a blueprint.
- Solve formulas by using unknowns and apply this knowledge to solve problems encountered in technological areas and various fields of engineering.
- Demonstrate quantitative measurement of electrical circuit parameters; assemble, and test direct current and alternating current series, parallel, and series parallel circuits.
- Explain the basic operation of a microprocessor/microcontroller.

Required Courses (28 units)		Units
ELE-11	DC Electronics	4
ELE-13	AC Electronics	4
ELE-26	Microprocessors and Microcontrollers	4
ELE/ENE-27	Technical Communications	3
ELE/MAN-64	Programmable Logic Controllers	3
ENE-51	Blueprint Reading	2
ENE-60	Math for Engineering Technology	3
MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	2
MAN-60	Hydraulics and Pneumatic Systems	3

**Associate in Science Degree**

The Associate in Science Degree in Manufacturing Technology, Automated Systems Technician 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 automated systems technician certificate program, students who complete the Associate in Science Degree in manufacturing technology will demonstrate proficiency in general education student learning outcomes and proficiency in subject matter student learning outcomes.

**COMPUTER NUMERICAL CONTROL PROGRAMMING (N)**

**NAS655/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 in 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 (29 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
MAN-52	Computer-Aided Manufacturing-Mastercam	4
MAN-53	Advanced Computer-Aided Manufacturing	3
MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	2
MAN-56	CNC Machine Set-up and Operation	4
MAN-57	CNC Program Writing	3

**Associate in Science Degree**

The Associate in 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 in Science Degree:

**COMPUTER-AIDED PRODUCTION TECHNOLOGY (N) NCE799**

Computer control programmers and operators use computer numerically controlled (CNC) machines to produce a wide variety of products, from automobile engines to computer keyboards. The Computer-Aided Production Technology certificate teaches how parts are produced in industry using Computer Numerical Control Machines and Computer Aided Machine programming systems. Students completing this certificate are prepared for entry-level employment as a Machinist or as Machine setters, operators and tenders.

**Certificate Program**

**Program Learning Outcomes**

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

- Create a steam or stirling engine that involves parts using both the mill and the lathe.
- Create a portfolio which may include printouts of Mastercam or other Computer Aided Manufacturing program part file drawings, numerical code files and operation sheets.
- Solve formulas by using unknowns.
- Establish a systematic approach to recognizing the essential information given on a blueprint.

Required Courses (14-15 units)		Units
ENE-51	Blueprint Reading	2
ENE-60	Math for Engineering Technology	3
MAN-55	Occupational Safety and Health Administration (OSHA) Standards for General Industry	2
MAN-56	CNC Machine Set-up and Operation	4
Electives	(Choose from list below)	3-4
Electives (3-4 units)		
MAN-52	Computer-Aided Manufacturing-Mastercam	4
MAN-57	CNC Program Writing	3
MAN-59	Computer-Aided Manufacturing-GibbsCAM	4

**MARKETING**

See [BUSINESS ADMINISTRATION](#)

**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) NAS536/NCE536 (WESTERN ASSOCIATION OF FOOD CHAINS)**

**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
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 in Science Degree**

The Associate in 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**

**GAME ART: 3D ANIMATION (N) NAS686/NCE686**

The Game Art: 3D Animation program is designed to provide students with the knowledge and skills necessary for an entry level job in the video games industry and animation industry. Courses cover fundamental artistic preparation and animation principles, as well as industry-standard production tools and techniques. Students are provided a solid foundation in traditional and digital art techniques which are then applied to 3D animation applications. Students learn to plan, set-up, execute, fine tune, and finally import character animations into a game engine. 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. Classes are taught in state-of-the-art computer studios with the latest versions of industry-standard software packages. Students will be prepared to enter the field as a junior character animator, previsualization artist, layout artist, or concept artist.

**Certificate Program**

**Program Learning Outcomes**

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

- Create accurate, scaled, well-constructed character and environment drawings for use in traditional 2D animation, Flash animation, and storyboards.
- Demonstrate competent skill in 3D character animation including thoughtful application of the 12 principles of animation.
- Utilize character animation cycles effectively within a game engine including the use of forward and inverse kinematics.
- Demonstrate effective professional communication skills while working with colleagues in an industry standard production project.
- Create an industry standard portfolio and demo reel containing 3D animations developed in class projects.

Required Courses (40 units)		Units
ART-17	Beginning Drawing	3
ART-44A	Beginning Animation Principles	3
CAT/CIS-54A	Introduction to Flash	3
GAM-31	Introduction to 3D Modeling	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-42	Photoshop for Game Art and Animation	3
GAM-44	Portfolio Production	2
GAM-47	Introduction to 3D Animation	3
GAM-48	3D Character Animation	3
GAM-70	Computer Skills for Game Art	1
GAM-71	Perspective for Game and Animation	3
GAM-72	Anatomy for Game Art	3
GAM-73	Storyboarding for Games	3
GAM-79	Game Studio Production	4

**Associate in Science Degree**

The Associate in Science Degree in Game Art: 3D Animation will be awarded upon completion of the degree requirements, including

general education and other graduation requirements as described in the college catalog.

**GAME ART: CHARACTER MODELING (N) NAS687/NCE687**

The Game Art: Character Modeling program is designed to provide students with the knowledge and skills necessary for an entry level job in the video games industry and animation industry. Courses cover fundamental artistic skills, human and animal anatomy, character design, 3D modeling, and rigging a character for animation. 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. Classes are taught in state-of-the-art computer studios with the latest versions of industry-standard software packages. Students will be prepared to enter the field 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 (37 units)		Units
ART-17	Beginning Drawing	3
GAM-31	Introduction to 3D Modeling	3
GAM-32	Designing Game Characters	3
GAM-33	Advanced Digital Sculpting	3
GAM-34	Character Rigging	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-42	Photoshop for Game Art and Animation	3
GAM-44	Portfolio Production	2
GAM-45	Materials and Lighting	3
GAM-70	Computer Skills for Game Art	1
GAM-71	Perspective for Game and Animation	3
GAM-72	Anatomy for Game Art	3
GAM-79	Game Studio Production	4



**Associate in Science Degree**

The Associate in 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/NCE688**

The Game Art: Environments and Vehicles program is designed to provide students with the knowledge and skills necessary for an entry level job in the video games industry. 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. Classes are taught in state-of-the-art computer studios with the latest versions of industry-standard software packages. Students will be prepared to enter the field as a 3-D environments artist, prop modeler, level builder or junior modeler.

**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 (31 units)		Units
ART-17	Beginning Drawing	3
GAM-31	Introduction to 3D Modeling	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-42	Photoshop for Game Art and Animation	3
GAM-44	Portfolio Production	2
GAM-45	Materials and Lighting	3
GAM-46	Environment and Vehicle Modeling	3
GAM-49	Game Modeling and Texturing	3
GAM-70	Computer Skills for Game Art	1
GAM-71	Perspective for Game and Animation	3
GAM-79	Game Studio Production	4

**Associate in Science Degree**

The Associate in 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 AUDIO (N)****NAS684/NCE684**

The Game Audio program is designed to provide students with the knowledge and skills necessary for an entry-level job in the video games industry or recording industry. Students will gain foundational skills in both the creative and technical side of game and multimedia audio design as well as an overview of the game industry. Courses cover fundamental skills in music, computer programming, recording, game development and sound design. Students will be prepared to enter the field as a sound designer, audio director, folio artist, composer, audio programmer or producer. The final course of this program is a capstone project with students from the other tracks of the game design program. Classes are taught in state-of-the-art facilities with the latest versions of industry-standard software packages.

**Certificate Program****Program Learning Outcomes**

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

- Understand the basic elements of game development and design including group working processes, game strategy, theory and gameplay.
- Diagram and describe the major elements of video games from its beginning through the present.
- Create multi-track MIDI and audio recordings utilizing basic and advanced editing techniques in Pro Tools.
- Create and implement audio assets for a video game utilizing industry-standard software, hardware, game engines and audio engine middleware.
- Create an industry-standard portfolio containing audio samples from class projects.
- Demonstrate professional communication skills effectively with colleagues in an industry production project.

Required Courses (38 units)		Units
CIS/CSC-5	Programming Concepts and Methodology I: C++	4
GAM-21	History of Video Games	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-44	Portfolio Productions	2
GAM-79	Game Studio Production	4
MUC-3	Introduction to Pro Tools: MIDI and Audio Production	3
MUC-4	Intermediate Pro Tools: 110	3
MUC-5	Sound Design I	3
MUC-6	Sound Design II	3
MUC-8	Composing Music for Video Games	3
MUS-3	Music Fundamentals	4
Electives	Choose from the list below	3

**Electives (3-4 units)**

GAM-22	Game Design Principles	4
MUC-9	Voice Acting and Dialogue for Games	3

**Associate in Science Degree**

The Associate in Science Degree in Game Audio 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/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/CIS-24	Video Game Prototyping	4
GAM-31	Introduction to 3D Modeling	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-42	Photoshop for Game Art and Animation	3
GAM-44	Portfolio Production	2
GAM/CIS-50	Introduction to Game Programming	3
GAM-79	Game Studio Production	4

**Associate in Science Degree**

The Associate in 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/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 (36-37 units)		Units
GAM/CIS-24	Video Game Prototyping	4
GAM-35	Introduction to Simulation and Game Development	3
GAM-44	Portfolio Production	2
GAM/CIS-50	Introduction to Game Programming	3
GAM-51	Game Mechanics and Simulation	3
GAM/CSC-52	Game Engine Scripting I	3
GAM/CSC-53	Game Engine Scripting II	3
GAM-79	Game Studio Production	4
MAT-35	Intermediate Algebra	5
Electives	Choose from list below	6-7

**Electives (6-7 units)**

GAM-21	History of Video Games	3
GAM-22	Game Design Principles	4
GAM-31	Introduction to 3D Modeling	3
GAM-42	PhotoShop for Game Art and Animation	3

**Associate in Science Degree**

The Associate in 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.

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

**GAME ART CORE (N) NCE855**  
Students completing the Game Art Core will have a broad background in art concepts and digital media and an overview of the games industry. Foundational skills prepare the student to focus on the advanced courses in one or more concentration areas: Environments and Vehicles, Character Modeling and/or 3D Animation.

#### Certificate Program

##### Program Learning Outcomes

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

- Navigate a computer operating system and utilize standard file management techniques such as creating, naming, copying, and saving files and folders and backing up files.
- Demonstrate competency in traditional illustration techniques through the creation of perspective and still life drawings.
- Demonstrate appropriate use of industry standard terminology and understand the game industry's primary production processes.
- Create and manipulate simple 3D models and assets which are ready to import into game engines or simulations.

Required Courses (16 units)		Units
GAM-31	Introduction to 3D Modeling	3
GAM-35	Introduction to Simulation and Game Development	3
GAM-42	Photoshop for Game Art and Animation	3
GAM-70	Computer Skills for Game Art	1
GAM-71	Perspective for Game and Animation	3
ART-17	Beginning Drawing	3

#### SUPPLY CHAIN TECHNOLOGY (N) NAS608/NCE608

Supply Chain Technologies such as Radio Frequency Identification (RFID), Geographic Information Systems (GIS) and Global Positioning Systems (GPS) are the critical technologies related to logistics. Logistics is the management of the flow of goods and services between the point of origin and the point of consumption in order to meet the requirements of customers. The Supply Chain Technology Certificate/Associate of Science degree prepares students for immediate entry or promotion within the Supply Chain/Warehousing/Transportation industry in a variety of roles such as Supply Chain Technician, designer of equipment to support operations within the supply chain. This program provides students with the theoretical knowledge and hands on training necessary to function as part of an interdisciplinary team in the creation of mechatronic equipment used in the supply chain.

#### Certificate Program

##### Program Learning Outcomes

Students will demonstrate proficiency sufficient to apply for and obtain entry-level employment in the field of Supply Chain Technology by compiling a portfolio of their work, which will include:

- Application of routing problems and algorithms related to transportation and delivery of goods and services;

- Description of the role of transportation in the economy and supply chain using ArcGIS;
- Application of Programmable Logic Control (PLCs) and Radio Frequency Identification systems to design, configure and drive conveyor belt systems.
- Compose written assignments on occupation safety in general industry on an advanced level to help companies prevent industrial accidents;
- Formal presentations as required by technicians working the field of supply chain technology.

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

Required Courses (25-29 units)		Units
SCT-2	Supply Chain Technology Analysis and Models	3
SCT-3	Supply Chain Technology	4
SCT-4	Transportation Technology and Vehicle Routing	3
ELE/ENE-27	Technical Communications	3
ELE/MAN-64	Programmable Logic Controllers	3
MAN-55	OSHA Standards for General Industry	2
MAN-60	Hydraulic/Pneumatic Systems	3
Electives	Choose either Option A or B	4-8

#### Option A (4 units)

ELE-10	Survey Electronics	4
--------	--------------------	---

OR

#### Option B (8 units)

ELE-11	DC Electronics	4
ELE-13	AC Electronics	4

#### Associate in Science Degree

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