

Career Technical Programs



www.clackamas.edu

Approved Related Instruction Courses

Associate of General Studies • Associate of Applied Science Certificates

Associate of Applied Science (AAS) Associate of General Studies (AGS)

For an Associate of Applied Science or Associate of General Studies degree complete one course from each of the following requirement areas:

- Communication
- Computation
- Human Relations
- Physical Education/Health/Safety/First Aid

Certificate of Completion (CC)

For a Certificate of Completion that is at least one academic year in program length, complete one course from each of the following requirement areas:

- Communication
- Computation
- Human Relations

Students are encouraged to work closely with an academic advisor if they are planning to transfer to a four-year institution upon completion of any of these programs.

List of Approved Courses:

The following represents approved courses for meeting related instruction requirement areas.

Communication

WR-101, 121, 122, 123, 222, 227, BA-214

Computation

Computer Science: CS-133VB, 161, 162, 260

Mathematics: MTH-050, 052, 054, 065 or above (except 199 and 299)

Human Relations

Business: BA-285

Criminal Justice: CJA-250

Education: ED-258

Human Services: HS-156

Oral Communication: COMM-100, 100A, 100B, 100C, 105, 126, 140, 218, 219, 227

Psychology: PSY-101, 110, 200, 205, 214, 215, 219, 221, 231, 240

Sociology: SOC-204, 205, 206, 223, 225, 230

Physical Education/Health/Safety/First Aid

Health/Safety/First Aid: Courses with an HE prefix or MFG-107

Physical Education: Courses with an HPE or PE prefix



Cooperative Work Experience (CWE)

The Cooperative Work Experience (CWE) is an internship program which offers students the opportunity to earn college credit by working in a job directly related to their program of study. CWE offers expanded learning experiences through exposure to actual work situations, organizational relationships, equipment, and techniques that cannot be duplicated in the classroom.

CCC's CWE program creates a vital bridge between college studies and workplace success

Requirements & Registration for CWE:

- Declare a program of study and complete all prereqs for CWE
- 1-3 terms before the end of your program, meet with the CWE instructor in your department to discuss CWE requirements.
- Determine number of credits to enroll in. You are expected to work approximately 30 hours for each CWE credit.
- Secure the CWE Work Site
 - If you have a job appropriate to your program of study, get this approved by your CWE instructor.
 - If you do not have a CWE site, find one with the assistance of your instructor
- Final Steps to enrolling in CWE
 - Fill out online application. (Application can be found at www.clackamas.edu/CWE-Students.aspx)
 - Fill out the form with 1) the appropriate CWE course for program of study, and 2) the classroom or online CWE seminar.
 - Get signature from your instructor on the registration form
 - Get signature and stamp from the CWE office on the registration form
 - Turn registration form in to registration office.
- Participate in a CWE seminar course on career management skills and complete seminar assignments.
- Successfully complete 30 hours of work experience for every credit.

Credit & Grading

The number of credits earned depends on the number of hours worked and the program requirements. Students may earn a maximum of 12 CWE credits per year.

Work/Credit Chart			
# of Credits	Hours Worked Per Week	Total Hours Per Term	Seminar Hours Per Term
6 credits	18-20 hours	180-216 hours	16 hours
5 credits	15-17 hours	150-179 hours	16 hours
4 credits	12-14 hours	120-149 hours	16 hours
3 credits	9-11 hours	90-119 hours	16 hours
2 credits	6-8 hours	60-89 hours	16 hours
1 credit	3-5 hours	30-59 hours	16 hours



Career Technical Programs

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Early Childhood Education & Family Studies.....	95	Renewable Energy Technology.....	130
Electronics Engineering Technology	97	Retail Management	132
Emergency Management.....	98	Under Car Technician–Automatic Transmission	76
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Fire Science (Wildland)	104	Water & Environmental Technology	134
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Accounting

Associate of Applied Science Degree

The Accounting program at Clackamas Community College emphasizes developing an advanced understanding of accounting principles, analytical skills and the capacity to solve problems. Students should have the ability to reason, read with comprehension and compute math applications.

The program is not designed to lead to a traditional four-year business administration degree. For students interested in pursuing a bachelor's degree, the Accounting Associate of Applied Science articulates to a Bachelor of Applied Science in Technology and Management at Oregon Tech.

For information contact Hugo Grimaldi, 503-594-3073 or hugog@clackamas.edu

PROGRAM OUTCOMES

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

- accurately analyze, journalize, and adjust accounting transactions and closing entries;
- accurately analyze and interpret basic financial statements,
- accurately prepare basic budgets,
- identify and explain the basics of general fund accounting as used in municipal governments,
- identify and explain basic tax concepts with regard to individuals, partnerships, and corporations;
- identify and explain the issues and objectives auditors face during the audit of financial statements,
- accurately prepare product cost sheets in order to price manufacture goods,
- accurately prepare accounting records for a business entity using Quickbooks.

CAREERS

Career opportunities include GS8 Accountant I, bookkeeper, data-entry clerk, financial staff accountant, cost accountant and general office clerk.

For information contact Hugo Grimaldi, 503-594-3073 or hugog@clackamas.edu

ACCOUNTING ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
BA-101	Introduction to Business	4
BA-104*	Business Math	3
BA-211	Financial Accounting I	4
BA-226	Business Law I	4
WR-121	English Composition	4
WINTER TERM		
BA-131	Introduction to Business Computing	4
BA-156	Business Forecasting	3
BA-177	Payroll Accounting	3
BA-212	Financial Accounting II	4
BA-251	Supervisory Management	3
SPRING TERM		
BA-205	Business Communications with Technology	4
BA-213	Decision Making with Accounting Information	4
BA-218	Personal Finance	4
BA-285	Human Relations in Business	4

ACCOUNTING ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM		CREDITS
BA-223	Principles of Marketing	4
BA-256	Income Tax Accounting	3
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
— —	Any BA/BT course not already included in the Accounting AAS program	3
WINTER TERM		
BA-206	Management Fundamentals	4
BA-216	Cost Accounting	3
BA-222	Financial Management	3
BA-227	Business Law II	4
SPRING TERM		
BA-217	Budgeting for Managers	3
BA-225	Business Report Writing	
or WR-227	Technical Report Writing	3-4
BA-228	Computerized Accounting	3
BA-255	Advanced Topics in Accounting & Auditing	4
BA-280	Business/CWE	3
Credits required for degree		93-94

* For this degree, BA-104 meets the Related Instruction Computation requirement.

Accounting Clerk

Certificate

Curriculum includes basic bookkeeping and accounting, including manual and computerized data entry, transaction analysis, preparation of financial statements and other related tasks. Graduates of this certificate program can specialize in tax preparation or general accounting assistant work.

PROGRAM OUTCOMES

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

- accurately analyze, journalize, and adjust accounting transactions and closing entries;
- accurately analyze and interpret basic financial statements,
- accurately prepare and account for basic payroll,
- accurately prepare basic budgets.

CAREERS

Career opportunities include accounts payable clerk, accounts receivable clerk and data entry clerk for small and medium-sized service businesses.

For information contact Hugo Grimaldi, 503-594-3073 or hugog@clackamas.edu

ACCOUNTING CLERK CERTIFICATE

FIRST TERM		CREDITS
BA-101	Introduction to Business	4
BA-104*	Business Math	3
BA-211	Financial Accounting I	
or BA-111	General Accounting I	4
WR-121	English Composition	4

Continued

*Accounting Clerk continued...***SECOND TERM**

BA-131	Introduction to Business Computing	4
BA-156	Business Forecasting	3
BA-177	Payroll Accounting	3
BA-212	Financial Accounting II	
or BA-112	General Accounting II	4
BA-251	Supervisory Management	3

THIRD TERM

BA-205	Business Communications with Technology	4
BA-213	Decision Making with Accounting Information	4
BA-226	Business Law I	4
BA-280	Business/CWE	3
BA-285	Human Relations in Business	4

Credits required for certificate 51

* For this certificate, BA-104 meets the Related Instruction Computation requirement.

Courses in this program can be applied to satisfy elective requirements in the Business AAS degree.

Administrative Office Professional

Associate of Applied Science Degree

This program provides a strong foundation of office and technology skills and courses in business administration, with an emphasis on critical thinking and human relations skills. The program includes Related Instruction requirements, industry standard computer programs and more advanced business administration courses.

PROGRAM OUTCOMES

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

- effectively and independently use Microsoft Office (Word, Excel, Access, and PowerPoint), Adobe Professional, and Google Applications;
- identify and analyze organizational and planning procedures in business office operations,
- identify and analyze effective working relationships and Human Resources practices within a business or office environment,
- articulate, analyze, and apply basic business math and accounting skills common to business operations;
- analyze the concepts, rules, and principles of law applying to effective business practices.

CAREERS

Career opportunities may include administrative assistant, office manager, project coordinator, legal assistant and medical secretary.

For information contact Beverly Forney, 503-594-3115 or beverlyf@clackamas.edu

ADMINISTRATIVE OFFICE PROFESSIONAL ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
BA-101	Introduction to Business	4
BA-131	Introduction to Business Computing	4
BT-121	Data Entry	1
BT-122	Keyboard Skillbuilding	2
BT-124	Business Editing I	3

WINTER TERM

BA-111	General Accounting	
or BA-211	Financial Accounting I	4
BT-125	Business Editing II	3
BT-160	Word I	3
CS-135S	Microsoft Excel	3
— —	Administrative Office Professional program electives	3

SPRING TERM

BA-228	Computerized Accounting	3
BT-161	Word II	3
BT-172	Introduction to Microsoft Outlook	2
BT-216	Office Procedures	4
WR-121	English Composition	4

ADMINISTRATIVE OFFICE PROFESSIONAL ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM		CREDITS
BA-218	Personal Finance	4
BA-226	Business Law I	4
BA-285	Human Relations in Business	4
BT-262	Integrated Projects	4

WINTER TERM

BA-104*	Business Math	3
BA-205	Business Communications with Technology	4
BA-206	Management Fundamentals	4
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
— —	Administrative Office Professional program electives	3

SPRING TERM

BA-224	Human Resource Management	4
BA-280	Business/CWE	3
BT-271	Advanced Business Projects	4
— —	Administrative Office Professional program electives	3

Credits required for degree 91

*For this degree, BA-104 meets the Related Instruction Computation requirement

ADMINISTRATIVE OFFICE PROFESSIONAL PROGRAM ELECTIVES

Any Business Administration (BA) or Business Technology (BT) course not included in the Administrative Office Professional program.

Administrative Office Assistant

Certificate

This program provides a strong foundation of basic skills in office administration. Emphasis is placed on critical thinking and human relations skills. Course work includes Related Instruction requirements, industry-standard computer programs and specific business and office administration courses.

PROGRAM OUTCOMES

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

- identify and analyze effective working relationships and Human Resources practices within a business or office environment,
- identify and analyze the skills necessary for effective business office operations,
- effectively use of Microsoft Office (Word, Excel, Access, and PowerPoint);
- apply correct English grammar in a business office environment,
- apply key concepts in the full cycle bookkeeping process,
- effectively apply basic math skills as required in business and financial environments.

CAREERS

Career opportunities include administrative assistant, legal secretary and medical secretary.

For information contact Beverly Forney, 503-594-3115 or beverlyf@clackamas.edu

ADMINISTRATIVE OFFICE ASSISTANT CERTIFICATE

FALL TERM		CREDITS
BA-104*	Business Math	3
BA-131	Introduction to Business Computing	4
BT-121	Data Entry	1
BT-122	Keyboarding Skillbuilding	2
BT-124	Business Editing I	3
WR-121	English Composition	4
WINTER TERM		
BA-285	Human Relations in Business	4
BT-125	Business Editing II	3
BT-160	Word I	3
CS-135S	Microsoft Excel	3
— —	Any BA/BT course not already included in the Administrative Office Assistant program	4
SPRING TERM		
BA-111 or BA-211	General Accounting I Financial Accounting I	4
BA-280	Business/CWE	3
BT-161	Word II	3
BT-172	Introduction to Microsoft Outlook	2
BT-216	Office Procedures	4
<i>Credits required for certificate</i>		50

* For this certificate, BA-104 meets the Related Instruction Computation requirement.

Administrative Office Assistant Training

Certificate

This is a targeted job training program designed for those seeking new career opportunities in administrative office support positions. This program covers two-thirds of the required curriculum for the Administrative Office Assistant (one-year) certificate program.

PROGRAM OUTCOMES

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

- identify and analyze organizational and planning procedures in business office operations,
- effectively use Microsoft Office Outlook (email, calendar, and meeting scheduling);
- effectively use Microsoft Office Word,
- apply correct English grammar in a business office environment,
- analyze and apply basic computer literacy, including typing by touch,
- apply key concepts in the full cycle bookkeeping process,
- effectively apply basic math skills as required in business and financial environments.

CAREERS

Continued education and/or experience may lead to positions such as administrative assistant, office manager, or legal or medical office assistants.

For information contact Beverly Forney, 503-594-3115 or beverlyf@clackamas.edu

ADMINISTRATIVE OFFICE ASSISTANT TRAINING CERTIFICATE

COURSE		CREDITS
BA-104	Business Math	3
BA-111	General Accounting I	4
BT-120	Personal Keyboarding	2
BT-122	Keyboard Skillbuilding	2
BT-124	Business Editing I	3
BT-125	Business Editing II	3
BT-160	Word I	3
BT-161	Word II	3
BT-172	Introduction to Microsoft Outlook	2
BT-216	Office Procedures	4
<i>Credits required for certificate</i>		29

Apprenticeship

Certificate

Associate of Applied Science Degree

Apprenticeship programs are approved for BOLI registered apprentices and are not available to the general student population. For more information about Oregon State registered apprenticeship programs, visit: www.oregon.gov/BOLI/ATD/Pages/A_Atdopen.aspx or contact the Apprenticeship and Training Division at 971-673-0760 for program and entrance requirements.

In conjunction with the Oregon State Apprenticeship Council, the Apprenticeship and Training Division (ATD), of the Bureau of Labor and Industry (BOLI), and local Joint Apprenticeship Training Committees (JATC), Clackamas Community College offers apprenticeship programs for the different trades. Clackamas' Apprenticeship model offers educational trainings to prepare students for careers in the trades, provides statewide transfer opportunities, ladder-type certificates of completion, and an optional transfer path into Bachelor of Science degrees at Oregon Tech.

Clackamas offers a Certificate of Completion (CC) and an Associate of Applied Science (AAS) degree in Electrician Technologies Apprenticeship for Hydro-Generation, Inside Electrician, Limited Energy Technician-License A, Limited Energy Technician-License B (CC only), Line Estimator, Lineman, Meterman, and Wireman; a Certificate of Completion and an Associate of Applied Science degree in Construction Trades, General Apprenticeship for Plumbers and Painters.

An apprentice has the opportunity to receive a certificate of completion (CC) and/or Associate of Applied Science degree (AAS) in their designated field of study upon the completion of their OJT, related training, journey level card/Certificate and the required Related Instruction courses and possible elective courses, depending on the trade.

For more information on Clackamas' apprenticeship certificates and degrees, please contact Leslie Donohue at 503-594-3031 or apprenticeship@clackamas.edu

RELATED TRAINING

The related training is usually available from a nearby community college, employer, or union-based training program. The related training courses are based on ATD and local JATC-approved related training courses developed to meet industry standards. The related training provides the theories and background information that a person may not otherwise be exposed to working on the job. This technical knowledge complements the on-the-job training during the apprenticeship program and requires at least 144 hours per year. The course of study relates to the specific craft (electrician, plumber, etc.). The related training is a vital component that provides the apprentice with a solid background from which to continue learning and growing to meeting the changing demands of the workplace.

APPRENTICE

Upon completion of an apprenticeship program, the worker has enjoyed the opportunity to work with qualified craft workers and has learned the theories and science of the craft from qualified instructors. In addition, the apprentice receives an Apprenticeship Certificate of Completion that is recognized by companies nationwide. This certificate is one of the most basic and highly portable industry credentials in use today.

PROGRAM OUTCOMES

Construction Trades, General Apprenticeship AAS Degree (Limited Entry Program-Journeyman's card required)

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

- complete a minimum of 6000-8000 hours State of Oregon-approved on-the-job training (OJT),
- repair, install and maintain a variety of building construction projects using trade specific tools and techniques in compliance with building codes and OSHA regulations,
- complete required related training with a C or better,
- complete required General Education instruction courses and general electives with a C or better.

CAREERS

6000-8000 Hours BOLI-ATD Trades: Asbestos Removal, Carpenter, HVAC/R, Interior/Exterior Finisher, Painter, Pile Driver, Plumber, Scaffold Erector, and Sheet Metal. (This degree does not guarantee licensure.)

PROGRAM OUTCOMES

Electrician Apprenticeship Technologies AAS Degree (Limited Entry Program-Journeyman's card required)

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

- complete the 6000-8000 hours State of Oregon-approved on-the-job training,
- apply theory to electrical wiring,
- repair, install electrical wire devices according to licensure regulations to meet NEC and OSC for inside electrician, limited energy technician license A, limited manufacturing plant electrician, sign assembler/fabricator, sign maker/erector, and stationary engineer;
- complete required related training with a C or better,
- complete required General Education instruction courses and general electives with a C or better.

CAREERS

6000 hour BOLI-ATD Trades: Limited Energy Technician-License A and Sign Maker/Fabricator.

8000 hour BOLI-ATD Trades: Hydro Generation, Inside Electrician, Line Estimator, Lineman, Manufacturing Plant Electrician, Meterman, Sign Assembler/Fabricator, Sign Maker/Erector and Stationary Engineer, and Wireman. (This degree does not guarantee licensure.)

PROGRAM OUTCOMES

Construction Trades, General Apprenticeship Certificate of Completion Degree (Limited Entry Program-Journeyman's card required)

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

- complete a minimum of 6000-8000 hours State of Oregon-approved on-the-job training (OJT),
- repair, install and maintain a variety of building construction projects using trade specific tools and techniques in compliance with building codes and OSHA regulations;
- complete required related training with a C or better.

CAREERS

6000-8000 hour BOLI-ATD Trades: Asbestos Removal, Carpenter, HVAC/R, Interior/Exterior Finisher, Painter, Pile Driver, Plumber, Scaffold Erector, and Sheet Metal. (This degree does not guarantee licensure.)

PROGRAM OUTCOMES

Electrician Apprenticeship Technologies Certificate of Completion Degree (Limited Entry Program-Journeyman's card required)

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

- complete the 6000-8000 hours State of Oregon-approved on-the-job training,
- apply theory to electrical wiring,
- repair and install electrical wire devices according to licensure regulations to meet NEC and OSC for inside electrician, limited energy technician license A, limited manufacturing plant electrician, sign assembler/fabricator, sign maker/erector, and stationary engineer;
- complete required related training with a C or better.

CAREERS

6000 hour BOLI-ATD Trades: Limited Energy Technician-License A and Sign Maker/Fabricator.

8000 hour BOLI-ATD Trades: Inside Electrician, Manufacturing Plant Electrician, Sign Assembler/Fabricator, Sign Maker/Erector and Stationary Engineer. (This degree does not guarantee licensure.)

PROGRAM OUTCOMES

Electrician Apprenticeship Technologies, Limited Electrician Technologies Certificate of Completion Degree (Limited Entry Program-Journeyman's card required)

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

- complete 4000 hours State of Oregon-approved on-the-job training (OJT),
- repair or install electrical wire devices according to limited licensure regulations to meet NEC and OSC for limited inside electrician--license B, limited maintenance electrician, limited renewable energy technician, and limited residential electrician;
- complete required related training with a C or better.

CAREERS

4000 hour BOLI-ATD Trades: Limited Energy Technician--license B, Limited Maintenance Electrician, Limited Renewable Energy Technician, and Limited Residential Electrician. (This degree does not guarantee licensure.)

Automotive Service Technology

Associate of Applied Science Degree

The program focuses on the repair and maintenance of passenger cars and light trucks. Course work includes cooperative work experience working for a local employer. Those who wish to specialize may take advanced mechanic studies courses for more in-depth experience. Students may enter the program any term.

PROGRAM OUTCOMES

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

- perform inspections on major automotive systems, including steering, suspension, and brakes;
- demonstrate and perform testing and servicing on all hybrid systems,
- understand and perform basic repairs to automotive electrical systems,
- diagnose, service, test and repair modern automotive brake systems, including ABS and traction control/vehicle stability systems;
- diagnose, service, and repair front and rear suspensions of different designs;
- diagnose and repair engine problems, including cylinder head and valvetrain, block, reciprocating assembly, and cooling system;
- service and repair fuel storage and delivery systems, electronic fuel injection systems and emission controls;
- rebuild manual and automatic transmissions, for both front and rear wheel drive vehicles.

CAREERS

Career opportunities include: automotive service mechanic/technician, recreational vehicle service technician and truck service mechanic/technician.

For information contact the Automotive Department, 503-594-3047.

AUTOMOTIVE SERVICE TECHNOLOGY**ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

FALL TERM		CREDITS
AM-121	General Auto Repair I	3
AM-129	Electrical Systems	7
AM-130	Brake Systems	7
WINTER TERM		
AM-122	General Auto Repair II	3
AM-131	Chassis Systems	7
MTH-050	Technical Mathematics I	
or MTH-065 Algebra II		3-4

Continued

*Automotive Service Technology continued...***SPRING TERM**

AM-123	General Auto Repair III	3
AM-133	Engine Systems	7
WR-101 or WR-121	Communication Skills: Occupational Writing English Composition	3-4

SUMMER TERM

AM-280*	Auto Mechanics/CWE	6
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**AUTOMOTIVE SERVICE TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
AM-245	Automatic Transmission Systems	7
WLD-102 or AB-112	Introduction to Welding Collision Repair Welding I	2
— —	Human Relations requirement (see page 68) (Recommended: PSY-101 or COMM-100**)	3
— —	PE/Health/Safety/First Aid requirement (see page 68) (Recommended: HE-252 or MFG-107)	3

WINTER TERM

AM-243	Fuel & Emission Control Systems	7
AM-244	Advanced Electrical Systems	7

SPRING TERM

AM-224	Comfort Systems	4
AM-228	Service Shop Management	4
AM-235	Power Transmission Systems	7

Credits required for degree 93-95

*May be taken after the first year

**COMM-100 may be substituted by taking all of the following:
COMM-100A, COMM-100B and COMM-100C

Note: Alternative course schedule is available. Contact the Automotive Department, 503-594-3047 for information.

Under Car Technician–Automatic Transmission

Career Pathway Certificate

The Under Car Technician–Automatic Transmission Program combines the initial courses of the Associate of Applied Science (AAS) Automotive Service Technology degree to provide the student with an opportunity to gain entry level employment. This alternate first-year schedule offers accelerated employment qualification for the student. These courses train the student in the skills necessary to earn certification from Automotive Service Excellence (ASE) in the specified areas of A2, A3, A4, and C1, as described in the ASE Alignment Section. Coursework also qualifies the student to earn American Welding Society (AWS) certification. The National Institute for Automotive Service Excellence requires two years of documented time in trade before testing, and this nine month program is awarded 4.5 months equivalency. The AWS requires one year of documented time in trade before testing. These classes comprise an alternate first year schedule of our AAS degree in Automotive Service Technology. They focus on one skill set necessary for employment within the automotive service industry.

PROGRAM OUTCOMES

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

- understand and perform basic repairs to automotive electrical systems,
- perform inspections on major automotive systems, including steering, suspension, and brakes;
- diagnose, service, and repair front and rear suspensions of different designs;
- demonstrate and perform testing and servicing on all hybrid systems,
- rebuild manual and automatic transmissions, for both front and rear wheel drive vehicles;
- diagnose, service, test and repair modern automotive brake systems, including ABS and traction control/vehicle stability systems;
- diagnose, service, and repair front and rear suspensions of different designs.

CAREERS

Manual transmission technician, automatic transmission technician, front-end and alignment technician, drive axle specialist, four wheel drive service technician, apprentice technician, and service writer.

For information, contact David Bradley, Automotive Department Chair, 503-594-3051 or bradleyd@clackamas.edu

**UNDER CAR TECHNICIAN—AUTOMATIC TRANSMISSION
CAREER PATHWAY CERTIFICATE**

FALL TERM		CREDITS
AM-121	General Auto Repair I	3
AM-129	Electrical Systems	7
AM-245	Automatic Transmission Systems	7
WINTER TERM		
AM-131	Chassis Systems	7
AM-122	General Auto Repair II	3
WLD-102 or AB-112	Introduction to Welding Collision Repair Welding I	2
SPRING TERM		
AM-123	General Auto Repair III	3
AM-228	Service Shop Management	4
AM-235	Power Transmission Systems	7
<i>Credits required for certificate</i>		43

ASE ALIGNMENT

AM-245 aligns with ASE A2 Automatic Transmission/ Transaxle
AM-131 aligns with ASE A4 Suspension and Steering
AM-235 aligns with ASE A3 Manual Drive Train and Axles
AM-228 aligns with ASE C1 Automotive Service Consultant

Under Car Technician–Manual Transmission

Career Pathway Certificate

The Under Car Technician–Manual Transmission Program combines the initial courses of the Associate of Applied Science (AAS) Automotive Service Technology degree to provide the student with an opportunity to gain entry level employment. This alternate first-year schedule offers accelerated employment qualification for the student. These courses train the student in the skills necessary to earn certification from Automotive Service Excellence (ASE) in the specified areas of A3, A4, A5, and C1, as described in the ASE Alignment Section. Coursework also qualifies the student to earn American Welding Society (AWS) certification. The National Institute for Automotive Service Excellence requires two years of documented time in trade before testing, and this nine month program is awarded 4.5 months equivalency. The AWS requires one year of documented time in trade before testing. These classes comprise an alternate first-year schedule of our AAS degree in Automotive Service Technology. They focus on one skill set necessary for employment within the Automotive Service industry.

PROGRAM OUTCOMES

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

- understand and perform basic repairs to automotive electrical systems,
- diagnose, service, test and repair modern automotive brake systems, including ABS and traction control/vehicle stability systems;
- diagnose, service, and repair front and rear suspensions of different designs;
- demonstrate and perform testing and servicing on all hybrid systems,
- perform inspections on major automotive systems, including steering, suspension, and brakes;
- diagnose, repair, or rebuild manual transmissions, transfer cases, and differentials in front, rear, and all wheel drive vehicles.

CAREERS

Manual transmission technician, front-end and alignment technician, brake technician, drive axle specialist, four wheel drive service technician, apprentice technician, and service writer.

For information contact David Bradley, Automotive Department Chair, 503-594-3051 or bradleyd@clackamas.edu

UNDER CAR TECHNICIAN–MANUAL TRANSMISSION CAREER PATHWAY CERTIFICATE

FALL TERM		CREDITS
AM-121	General Auto Repair I	3
AM-129	Electrical Systems	7
AM-130	Brake Systems	7

WINTER TERM

AM-131	Chassis Systems	7
AM-122	General Auto Repair II	3
WLD-102 or AB-112	Introduction to Welding Collision Repair Welding I	2

SPRING TERM

AM-123	General Auto Repair III	3
AM-235	Power Transmission Systems	7
AM-228	Service Shop Management	4
Credits required for certificate		43

ASE ALIGNMENT

AM-130 aligns with ASE A5 Brakes
 AM-131 aligns with ASE A4 Suspension and Steering
 AM-235 aligns with ASE A3 Manual Drive Train and Axles
 AM-228 aligns with ASE C1 Automobile Service Consultant

Under Hood Technician

Career Pathway Certificate

The Under Hood Technician Program combines the initial courses of the Associate of Applied Science (AAS) Automotive Service Technology degree to provide the student with an opportunity to gain entry level employment. This alternate first-year schedule offers accelerated employment qualification for the student. These courses train the student in the skills necessary to earn certification from Automotive Service Excellence (ASE) in the specified areas of A1, A6, A7, A8, C1, and L1, as described in the ASE Alignment Section. Coursework also qualifies the student to earn American Welding Society (AWS) certification. The National Institute for Automotive Service Excellence requires two years of documented time in trade before testing, and this nine month program is awarded 4.5 months equivalency. The AWS requires one year of documented time in trade before testing. These classes comprise an alternate first year schedule of our AAS degree in Automotive Service Technology. They focus on one skill set necessary for employment within the Automotive Service industry.

PROGRAM OUTCOMES

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

- perform inspections on major automotive systems, including steering, suspension, and brakes;
- understand and perform basic repairs to automotive electrical systems,
- service and repair fuel storage and delivery systems, electronic fuel injection systems and emission controls;
- diagnose and repair engine problems, including cylinder head and valvetrain, block, reciprocating assembly, and cooling system;
- diagnose and repair electrical accessories, gauges, warning devices, and information systems;
- diagnose computerized engine controls and ignition systems,
- diagnose and repair heating and air conditioning systems.

Continued

Under Hood Technician continued...

CAREERS

Diagnostic tune-up technician, electrical and electronics specialist, air conditioning service technician, apprentice technician, and service writer.

For information, contact David Bradley, Automotive Department Chair at 503-594-3051 or bradleyd@clackamas.edu

UNDER HOOD TECHNICIAN CAREER PATHWAY CERTIFICATE

FALL TERM		CREDITS
AM-121	General Auto Repair I	3
AM-129	Electrical Systems	7
WLD-102 or AB-112	Introduction to Welding Collision Repair Welding I	2
WINTER TERM		
AM-122	General Auto Repair II	3
AM-243	Fuel & Emission Control Systems	7
AM-244	Advanced Electrical Systems	7
SPRING TERM		
AM-224	Comfort Systems	4
AM-133	Engine Systems	7
AM-228	Service Shop Management	4
<i>Credits required for certificate</i>		44

ASE ALIGNMENT

AM-129 and AM-244 align with ASE A6 Electrical/Electronic Systems
 AM-243 aligns with ASE A8 Engine Performance, and L1 Advanced Engine Performance Specialist
 AM-133 aligns with ASE A1 Engine Repair
 AM-224 aligns with ASE A7 Heating and Air Conditioning
 AM-228 aligns with ASE C1 Automotive Service Consultant

Business

Associate of Applied Science Degree

This AAS degree establishes a foundation for a successful management career while enabling students to explore a wide variety of business topics. The program is designed to enhance skills and employability for students who desire a career path in management as well as those who choose the entrepreneurial path. The AAS in Business permits students to complete certificates in Accounting, Business Management, Human Resource Management, Marketing, Project Management or Retail Management and to apply those credits towards completion of the AAS in Business degree. Students may also select courses from a cross section of the aforementioned disciplines.

PROGRAM OUTCOMES

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

- demonstrate an understanding of fundamental business concepts through the integration of the functional areas of business into a comprehensive plan,
- interpret and present business-related financial information,

- use Microsoft Office applications to create business documents, data files and presentations;
- demonstrate the ability to communicate effectively,
- identify effective human resource practices,
- demonstrate an understanding of key legal concepts as they apply to business, e.g. torts, crimes, ethics, and contracts;
- identify effective interpersonal strategies for individual and group situations.

CAREERS

Career opportunities include managers, coordinators, or supervisors in areas such as project management, human resource management, customer service, or retail management.

For information contact Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

BUSINESS ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
BA-101	Introduction to Business	4
BA-104*	Business Math	
or MTH-065	Algebra I	3-4
BA-224	Human Resource Management	4
WR-121	English Composition	4

WINTER TERM

BA-131	Introduction to Business Computing	4
BA-223	Principles of Marketing	4
BA-285	Human Relations in Business	4
— —	Business program electives	3

SPRING TERM

BA-205	Business Communications with Technology	4
BA-211	Financial Accounting I	4
BA-226	Business Law I	4
— —	Business program electives	3

BUSINESS ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM		CREDITS
BA-206	Management Fundamentals	4
BA-212	Financial Accounting II	4
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
— —	Business program electives	7

WINTER TERM

BA-213	Decision Making with Accounting Information	4
— —	Business program electives	12

SPRING TERM

BA-217	Budgeting for Managers	3
WR-227 or BA-225	Technical Report Writing Business Report Writing	3-4
BA-280	Business/CWE	3
— —	Business program electives	7

Credits required for this degree: **93-95**

* For this degree, BA-104 meets the Related Instruction Computation requirement.

BUSINESS PROGRAM ELECTIVES

Any Business Administration (BA) or Business Technology (BT) course not included in the Business AAS program; or up to 12 credits from CS-125P, CS-125R, CS-133VA, CS-133VB, CS-135DB, CS-135I, CS-135S, CS-135W, EC-201, EC-202, COMM-111, MTH-111, MTH-243, and MTH-244 may also be used to satisfy program electives.

Business Management

Certificate

This certificate focuses on basic management and leadership skills, motivation, decision-making, ethics, work flow analysis, ergonomics, personality and human relations, communications, technological innovations and adapting to change.

PROGRAM OUTCOMES

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

- demonstrate an understanding of fundamental business concepts through the integration of the functional areas of business into a comprehensive plan,
- select appropriate marketing strategies for an organization,
- make informed business decisions based on the use analysis of financial and budgetary data,
- demonstrate an understanding of the functions of leading, planning, organizing, and controlling in an organization;
- identify effective supervisory strategies (e.g. motivation, goal setting, coaching, leadership, etc.) for given individual and group situations;
- demonstrate all the programs learning outcomes for the Management Fundamentals Career Pathway Certificate.

CAREERS

Career opportunities include management trainee, first-line supervisory, management analyst, merchandiser, or marketing/sales representative in small and medium-sized retail and service companies.

For information call Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

BUSINESS MANAGEMENT CERTIFICATE

FALL TERM		CREDITS
BA-101	Introduction to Business	4
BA-104*	Business Math	3
BA-131	Introduction to Business Computing	4
BA-211	Financial Accounting I	4
WR-121	English Composition	4
WINTER TERM		
BA-156	Business Forecasting	3
BA-223	Principles of Marketing	4
BA-226	Business Law I	4
BA-251	Supervisory Management	3
BA-285	Human Relations in Business	4

SPRING TERM

BA-205	Business Communications with Technology	4
BA-206	Management Fundamentals	4
BA-217	Budgeting for Managers	3
BA-224	Human Resource Management	4
BA-280	Business/CWE	3

Credits required for certificate 55

* For this certificate, BA-104 meets the Related Instruction Computation requirement.

Courses in this program can be applied to satisfy elective requirements in the Business AAS degree.

Management Fundamentals

Career Pathway Certificate

This program is designed for students who seek a foundation of managerial knowledge to support their advancement toward a career in management.

PROGRAM OUTCOMES

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

- demonstrate the ability to communicate effectively,
- identify the various laws that impact employee management practices,
- identify effective supervisory strategies (e.g. motivation, goal setting, coaching, leadership, etc.) for given individual and group situations.

CAREERS

Career opportunities include frontline or entry-level supervisory positions in retail, manufacturing, sales, and service industries.

For information contact Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

MANAGEMENT FUNDAMENTALS CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
BA-205	Business Communications with Technology	4
BA-217	Budgeting for Managers	3
BA-224	Human Resource Management	4
BA-251	Supervisory Management	3
BA-285	Human Relations in Business	4
WR-121	English Composition	4

Credits required for certificate 22

Courses in this program can be applied to satisfy requirements in the Business Management certificate.

Human Resource Management

Certificate

This certificate is recommended for students and/or professionals currently working in the human resource field who wish to obtain national certification in Professional in Human Resources (PHR) from the Human Resource Certification Institute. Though this certificate is intended to enhance the qualifications of people already working in the human resource field, others may wish to take the classes to advance their own skills and knowledge.

PROGRAM OUTCOMES

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

- describe the impacts of the major laws and Supreme Court decisions affecting Human Resource Managers,
- describe disparate treatment and adverse impact, and explain the Uniform Guidelines related to national origin, religion, and other discrimination;
- conduct job analyses,
- conduct recruitment and selection processes, and advise hiring supervisors regarding legal and ethical issues,
- implement and maintain Human Resource Management processes, including Training and Development and Performance Management, under direction of HR Manager;
- describe issues related to financial equity and direct and indirect financial compensation,
- apply reflective thinking and self-management in professional settings,
- explain legal and process considerations related to collective bargaining and Collective Bargaining Agreement management.

CAREERS

Career opportunities include human resource manager, human resource generalist, human resource specialist, human resource assistant, and information and records clerk.

For information contact Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

HUMAN RESOURCE MANAGEMENT CERTIFICATE

FALL TERM		CREDITS
BA-101	Introduction to Business	4
BA-211	Financial Accounting I	4
BA-224	Human Resource Management	4
BA-226	Business Law I	4
WR-121	English Composition	4
WINTER TERM		
BA-177	Payroll Accounting	3
BA-206	Management Fundamentals	4
BA-208	Employee Labor Relations	4
BA-285	Human Relations in Business	4
BA-104*	Business Math	4
or MTH-065 Algebra II		3-4

SPRING TERM

BA-131	Introduction to Business Computing	4
BA-229	Employment Law	4
BA-254	Basic Compensation and Benefits	4
BA-280	Business/CWE	3

Credits required for certificate 53-54

* For this certificate, BA-104 meets the Related Instruction Computation requirement.

Courses in this program can be applied to satisfy requirements in the Business AAS degree.

Human Resource Management Essentials

Career Pathway Certificate

This program is designed for students who either are currently employed in or desire to be employed in Human Resource Management (HRM), and who lack formal education in Human Resource Management laws and processes. The classes provided in this pathway certificate form the foundation for work as a Human Resource Manager or for future education in the discipline.

PROGRAM OUTCOMES

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

- describe the impacts of major laws and Supreme Court decisions affecting Human Resource Managers,
- describe disparate treatment and adverse impact, and explain the Uniform Guidelines related to national origin, religion, and other discrimination;
- assist in conducting job analyses,
- assist in recruitment and selection processes, and advise hiring supervisors regarding legal and ethical issues,
- assist in implementing and maintaining Human Resource Management processes, including Training and Development and Performance Management;
- describe issues related to financial equity and direct and indirect financial compensation,
- apply reflective thinking and self-management in professional settings.

CAREERS

Careers includes human resource specialists, human resource generalists, and human resource assistants.

For information contact Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

HUMAN RESOURCE MANAGEMENT ESSENTIALS CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
BA-224	Human Resource Management	4
BA-229	Employment Law	4
BA-254	Basic Compensation and Benefits	4
BA-285	Human Relations in Business	4
<i>Credits required for certificate</i>		16

Courses in this program can be applied to satisfy requirements in the Human Resource Management certificate.

Marketing

Certificate

This certificate focuses on technical marketing skills in areas such as need identification, product and service development, determining price, communicating information to potential customers, and distributing the products to customers.

PROGRAM OUTCOMES

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

- demonstrate the skills necessary for entry-level employment in areas such as retail and wholesale sales, marketing management, market research and advertising and distribution;
- develop a business plan,
- develop a marketing plan,
- develop a promotional plan,
- launch an entrepreneurial endeavor,
- prepare and deliver effective presentations,
- demonstrate an understanding of fundamental business concepts through the integration of the functional areas of business into a comprehensive plan.

CAREERS

Career opportunities include wholesale and manufacturing sales representative, insurance and financial sales agents and marketing and advertising assistants.

For students interested in an AAS in Business with a concentration in Marketing, include the following courses within your Business AAS electives: BA-223 Principles of Marketing, BA-238 Sales, BA-239 Advertising, & BA-261 Consumer Behavior

For information contact Dale Hatfield, 503-594-3074 or daleh@clackamas.edu

MARKETING CERTIFICATE

FALL TERM		CREDITS
BA-101	Introduction to Business	4
BA-131	Introduction to Business Computing	4
BA-239	Advertising	4
WR-121	English Composition	4
WINTER TERM		
BA-104*	Business Math	3
BA-156	Business Forecasting	3
BA-223	Principles of Marketing	4
BA-285	Human Relations in Business	4
SPRING TERM		
BA-205	Business Communications with Technology	4
BA-226	Business Law I	4
BA-238	Sales	4
BA-261	Consumer Behavior	4
BA-280	Business/CWE	3
<i>Credits required for certificate</i>		49

* For this certificate, BA-104 meets the Related Instruction Computation requirement.

Courses in this program can be applied to satisfy elective requirements in the Business AAS degree.

Integrated Marketing & Promotion

Career Pathway Certificate

Students who successfully complete this pathway will be prepared to develop integrated marketing and promotional strategy within the current business environment. Skills developed in this pathway should enhance effectiveness of the marketing and promotional functions for small business owners and develop practical marketing and promotion skills for employees working within the marketing function.

PROGRAM OUTCOMES

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

- demonstrate a conceptual understanding of the strategic organization through the integration of the functional areas of business into a comprehensive marketing plan,
- develop a marketing plan,
- develop a promotional plan,
- prepare and deliver effective presentations.

For information contact Dale Hatfield, 503-594-3074 or daleh@clackamas.edu

INTEGRATED MARKETING & PROMOTION CAREER PATHWAY CERTIFICATE

COURSE	CREDITS
BA-223 Principles of Marketing	4
BA-238 Sales	4
BA-239 Advertising	4
BA-261 Consumer Behavior	4
<i>Credits required for certificate</i>	16

Courses in this program can be applied to satisfy requirements in the Marketing certificate.



CAD/CAM Technology

Associate of Applied Science Degree

This program combines training in computer-aided drafting (CAD) and computer-aided manufacturing (CAM). Course work emphasizes machine tool fundamentals, computer numerical control (CNC) and computer-aided manufacturing.

PROGRAM OUTCOMES

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

- accurately interpret technical drawings to determine product manufacturing specifications;
- work safely in an industrial environment around machinery, power tools and chemicals;
- operate manual machine tools to produce products to required specifications;
- operate CNC machine tools including: program try-out, tooling/work-piece setup and adjustment, communicate effectively with G & M code language to perform everyday machining operations on three-axis milling machines and two-axis lathes;
- utilize computer software to create CAD models and CAM generated programs for machining processes;
- apply technical mathematics to solve manufacturing problems including: manual machining positioning, dimensional inspection, and NC programming;
- apply knowledge of materials, physics and mathematics to effectively machine industrial materials;
- plan manufacturing operations in a logical and efficient manner to produce products on both manual and CNC machine tools;
- work and communicate effectively in team environment to achieve high quality value stream;
- work independently to solve common problems in manufacturing processes;
- apply industrial drafting standards to technical drawings;
- use CAD software to develop, modify and test machine elements and assemblies in 2D and 3D applications.

CAREERS

Career opportunities may include CNC programmer and operator, CAD technician, manufacturing engineering technician and CAD/CAM technician. For information contact Mike Mattson, 503-594-3322 or mattsonm@clackamas.edu

MANUFACTURING ENGINEERING TECHNOLOGY (Oregon Tech transfer courses)

The Manufacturing Technology Department, in partnership with Oregon Tech, offers a significant number of transferable classes into Oregon Tech's Manufacturing Engineering Technology degree program.

Contact the Manufacturing Department for more information, 503-594-3318.

CAD/CAM TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FIRST TERM		CREDITS
CDT-102	Sketching and Problem Solving	3
CDT-108A	Introduction to SolidWorks	3
MFG-104	Print Reading	2
MTH-050**	Technical Mathematics I	3
WR-101**	Communication Skills: Occupational Writing	3

SECOND TERM

CDT-223	Inventor Fundamentals	
or CDT-225	Advanced SolidWorks	3
MFG-105	Dimensional Inspection	2
MFG-109	Computer Literacy for Technicians	3
MFG-111	Machine Tool Fundamentals I	6
MTH-080**	Technical Mathematics II	3

THIRD TERM

MFG-106	Applied Geometric Dimensioning & Tolerancing for Manufacturing	3
MFG-112	Machine Tool Fundamentals II	6
MFG-221	Materials Science	3
— —	CAD/CAM program elective	3

CAD/CAM TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FOURTH TERM		CREDITS
MFG-113	Machine Tool Fundamentals III	6
MFG-201	CNC I: Set-up & Operation	4
MFG-204	Computer-Aided Manufacturing I	4
— —**	Human Relations requirement (see page 68)	3

FIFTH TERM

MFG-202	CNC II: Programming & Operation	4
MFG-205	Computer-Aided Manufacturing II	4
MFG-209	Programming and Automation for Manufacturing	3
MFG-107	Industrial Safety & First Aid	3

SIXTH TERM

MFG-203	CNC III: Applied Programming & Operation	3
MFG-206	Computer-Aided Manufacturing III	3
MFG-211	Machine Tool Fundamentals IV	6
MFG-280	Manufacturing Technology/CWE	4

Credits required for degree 93

CAD/CAM TECHNOLOGY PROGRAM ELECTIVES

Any course with a CDT, EET, GIS, MFG, RET, SM or WLD prefix.

Students with specialized job training needs may be eligible to substitute some classes. Consult your instructor or the department chair for more information.

**Substitute college transfer courses for these courses if you plan to continue your education at a higher education institution. It is recommended that you consult with a faculty advisor or a staff member in Student Services for the transfer requirements of the specific advanced program or school.

Clinical Laboratory Assistant

Certificate

Clinical laboratory assistants serve a diverse ancillary role assisting other laboratory personnel, physicians and patients. Their duties may include data entry, laboratory billing practices, and the performance of waived testing according to standard operating procedures. Students are trained in all aspects of the medical laboratory support personnel, including phlebotomy, specimen processing, quality control, laboratory orientation, and regulation. Students will participate in unpaid, supervised externships in ambulatory or acute care laboratory settings. See website below for Program mission statement.

The CCC Clinical Laboratory Assistant (CLA) program is approved through the National Accrediting Agency for Clinical Laboratory Science (NAACLS), 5600 N River Rd, Suite 720, Rosemont, IL, 60018, 773-714-8880, www.naaccls.org

PROGRAM REQUIREMENTS AND PREREQUISITES

Students who wish to apply to the CLA program are welcome to apply for our fall cohort. The CLA applications may be downloaded from our website.

To determine the availability of applications and the appropriate deadlines for each cohort, please visit the Health Sciences website: www.clackamas.edu/Programs/Clinical-Laboratory-Assistant.aspx

Applicants are advised that a high level of dexterity, the ability to multi-task, and a high degree of attention to detail are required for the successful completion of this program. For a complete list of Essential Functions please visit the above website.

During the application process, CLA applicants must:

- Meet appropriate placement scores in reading, writing, and math by either taking the placement exams or by providing proof of comparable assessment. The CLA program accepts competencies in writing, math, and reading as measured by CCC placement assessments dated no earlier than 2003, or previous college coursework as documented on official college transcripts. To be eligible to apply, students must show placement by: 1) passing WR-095 or placement in WR-121; 2) passing RD-090 or placement in RD-115.
- Have completed MA-110 Medical Terminology, and MTH-050 Technical Mathematics I or MTH-065 Algebra II. Curriculum prerequisites and requirements may be subject to change. In order to assure students have the most current information, please review the department website.
- Provide; 1) proof of a recent physical examination by a licensed healthcare provider, 2) required immunizations, 3) a current AHA or ASHI Healthcare Provider CPR, First Aid card, and complete a criminal history background check and drug testing as arranged by the Health Sciences department. Students may also be subject to a second drug and criminal screen just prior to clinical placement depending on clinical site requirements.

CLA students will be required to participate in unpaid, supervised externships in ambulatory or acute care laboratory settings. For a list of community partners, please visit the website.

PROGRAM OUTCOMES

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

- demonstrate the ability to serve in an entry-level role as a clinical laboratory assistant,
- demonstrate proficiency in all types in blood collection techniques,
- understand and apply all laboratory regulations, standard operating procedures, Health and safety issues, and Quality Assurance;
- understand the roles of all laboratory personnel,
- demonstrate knowledge of health care delivery model and how clinical laboratories are an integrated part of patient care,
- successfully pass the Clinical Laboratory Assistant/Phlebotomy entry-level certification examinations.

CLINICAL LABORATORY ASSISTANT APPLICATION REQUIREMENTS

Application packets with admission procedures and requirements are available online: www.clackamas.edu/Programs/Clinical-Laboratory-Assistant.aspx

CAREERS

Career opportunities may include but are not limited to phlebotomist, laboratory specimen processor, waived testing analyzer, medical research assistant and physician office laboratory assistant.

For continuing education opportunities for healthcare providers see Healthcare Professional Development (HPD) in the course description section on page 198.

For more information, contact: health-sciences-questions@clackamas.edu

CLINICAL LABORATORY ASSISTANT CERTIFICATE PREREQUISITES

The following prerequisites must be completed prior to the start of the student's cohort. Curriculum prerequisites and requirements may change yearly. To see prerequisites or requirements, please review the department website.

COURSE		CREDITS
MA-110	Medical Terminology	3
MTH-050	Technical Mathematics I or MTH-065 Algebra II	3-4

CLINICAL LABORATORY ASSISTANT CERTIFICATE

FALL TERM		CREDITS
BI-120*	Introduction to Human Anatomy & Physiology	4
CLA-100	Introduction to Healthcare	2
CLA-101	Clinical Laboratory Assistant Skills I	4
CLA-118	Phlebotomy for Clinical Laboratory Assistants	2
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4

Continued

*Clinical Laboratory Assistant continued...***WINTER TERM**

CLA-102	Clinical Laboratory Assistant Skills II	4
CLA-115	Laboratory Administrative Skills	2
CLA-119	Phlebotomy/Laboratory Practicum I	3
CLA-130	Specimen Collection	1
CS-120	Survey of Computing	4

SPRING TERM

CLA-103	Clinical Laboratory Assistant Skills III	4
CLA-120	Phlebotomy/Laboratory Practicum II	4
CLA-125	Introduction to Clinical Research	2
COMM-100**	Basic Speech Communication	
or COMM-111	Public Speaking	
or COMM-218	Interpersonal Communication	3-4
PSY-101	Human Relations	3

Credits required for certificate 51-54

*Additional options to meet biology requirement: pass with C or better BI-101 & BI-102 or successfully complete the entire BI-231, BI-232, BI-233, Anatomy & Physiology series.

**COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C

Current First Aid card and Healthcare Provider level CPR (AHA or ASHI) card are required during practicums and must be taken prior to the first term practicum. All CLA students will be required to complete a criminal history background, provide proof of immunization, and take a drug test.

Note: All clinical practicum courses are Pass/No Pass. All other courses are letter grades and must be passed with a C grade or better in order to continue to the next term.

Core curriculum is sequential and may not be taken out of order, with the exception of CLA-100 which may be taken prior to beginning the program. Curriculum is intended to be completed in one academic year.

Individuals who have been found guilty of a felony or pleaded guilty to a felony may not be eligible for clinical practicum placement or be eligible to take the National exams.



Collision Repair and Refinishing Technology

Associate of Applied Science Degree

The Collision Repair and Refinishing program simulates real working conditions in a well-equipped modern shop facility. Training combines intensive theory and practical lab experience tailored to specific needs. Course work includes one term of cooperative work experience with a local employer. The flexibility of the program allows students to enter any term and proceed at their own pace.

Technicians repair or replace parts, straighten structure, install and adjust glass and components, repair electrical systems, restraints, suspension components, brakes, prepare all types of surfaces for necessary refinishing operations, mix and apply modern urethane and waterborne paint products, and finish their work to industry standards. Skills learned include welding, metal straightening, filler use, plastic repair, surface preparation, masking, product selection, mixing, color matching and application techniques, as well as detailing and troubleshooting.

PROGRAM OUTCOMES

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

- demonstrate the proper selection of tools and materials needed to perform metal straightening and plastic filler repair processes;
- prepare a repaired surface, choose and apply appropriate materials, block sand, clean surface, and apply topcoat, detail;
- repair sheet metal damage, demonstrate panel replacement techniques, identify structural damage, and formulate viable repair processes;
- perform spot repairs and blends using the latest industry accepted practices and materials, to the standards of industry;
- demonstrate skill in major body repair, including frame and unibody repair;
- demonstrate the use of electronic frame measuring systems, during the repair of full frame and unibody vehicles;
- plan and execute an industry acceptable repair on both full frame and unibody vehicles, including structural, non-structural, cosmetic and mechanical repairs;
- display the skills needed to apply high-end automotive finishes to a variety of automotive substrates;
- perform a variety of welding processes needed to properly repair vehicles of both steel and aluminum construction, in accordance with I-CAR guidelines;
- demonstrate competency in Collision Repair Estimating, using Mitchells, Shoplink, and CCC One software.

CAREERS

Employment opportunities include auto body technician, frame technician, auto body mid-tech, painter's helper, painter, estimator or manager in an independent repair shop, automobile dealership, truck or heavy equipment dealer or service center, or sales of auto body related tools and materials.

For information contact Dave Bradley, 503-594-3051, or the Automotive Department, 503-594-3047.

**COLLISION REPAIR AND REFINISHING TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

FIRST TERM		CREDITS
AB-112	Collision Repair Welding I	2
AB-113	Collision Repair I/Nonstructural	6
ABR-125	Collision Repair Refinishing I	6
MTH-050	Technical Mathematics I	3-4
	or MTH-065 Algebra II	
SECOND TERM		
AB-123	Collision Repair Welding II	2
AB-133	Collision Repair II/Structural	6
ABR-127	Collision Repair Refinishing II*	6
THIRD TERM		
AB-222	Collision Repair III/Advanced Structural	6
ABR-129	Collision Repair Refinishing III	6
— —	Human Relations requirement (see page 68)	3
	(Recommended: COMM-100** or PSY-101)	

**COLLISION REPAIR AND REFINISHING TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FOURTH TERM		CREDITS
AB-149	Collision Repair Estimating I	2
AB-224	Collision Repair IV/Advanced Structural	6
ABR-225	Production Shop Techniques	6
— —	PE/Health/Safety/First Aid requirement (see page 68) (Recommended: HE-252 or MFG-107)	3
FIFTH TERM		
AB-150	Collision Repair Computerized Estimating-Shoplink	2
AB-226	Collision Repair V/Advanced Structural	6
AB-235	Collision Repair Welding III	2
ABR-227	Restoration Practices	6
SIXTH TERM		
AB-151	Collision Repair Computerized Estimating-CCONE	2
AB-280	Collision Repair/CWE	6
ABR-142	Airbrush Art	2
or ABR-152	Custom Painting Fundamentals	
or ABR-162	Basic Automotive Pinstriping	
WR-101	Communication Skills: Occupational Writing	3-4
or WR-121	English Composition	
<i>Credits required for degree</i>		<i>92-94</i>

* Program requirements: Current enrollment in or successful completion of AB-112 Collision Repair Welding I and ABR-125 Collision Repair Refinishing I must be completed or in progress prior to enrolling in ABR-127 Collision Repair Refinishing

**COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C

Collision Repair Refinishing Technology

Career Pathway Certificate

The Collision Repair Refinishing Technology program simulates real working conditions in a well-equipped modern shop facility. Training combines intensive theory and practical lab experience tailored to specific needs. In order to complete the course in three consecutive terms, students must start fall term.

Technicians repair or replace parts, straighten frames and unibody structure, install and adjust components and glass, repair electrical systems, restraints, suspension components, brakes, prepare all types of surfaces for necessary refinishing operations, mix and apply modern waterborne and solvent-borne paint products, and finish their work to industry standards. Skills learned include welding, metal straightening, filler use, plastic repair, surface preparation, masking, product selection, mixing, color matching and application techniques, as well as detailing and troubleshooting. This certificate qualifies students to apply for an I-CAR Pro Level 1 Certification.

PROGRAM OUTCOMES

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

- demonstrate the proper selection of tools and materials needed to perform metal straightening and plastic filler repair processes,
- prepare a repaired surface, choose and apply appropriate materials, block sand, clean surface, and apply topcoat, detail;
- repair sheet metal damage, demonstrate panel replacement techniques, identify structural damage, and formulate viable repair processes;
- perform spot repairs and blends using the latest industry accepted practices and materials, to the standards of industry;
- demonstrate skill in major body repair, including frame and unibody repair;
- perform a variety of welding processes needed to properly repair vehicles of both steel and aluminum construction, in accordance with I-CAR guidelines,
- demonstrate competency in Collision Repair Estimating, using Mitchells, and Shoplink software.

CAREERS

Employment opportunities may include entry level positions as a prepper, masker, painter's helper, body mid-tech, paint or body technician at independent, dealership, or fleet repair facilities in any transportation related field: automotive, trucking, transit, light rail, aircraft, recreational vehicle, industrial or marine.

For information contact Dave Bradley, 503-594-3051, or the Automotive Department, 503-594-3047.

Continued

Collision Repair Refinishing Technology continued...

COLLISION REPAIR REFINISHING CAREER PATHWAY CERTIFICATE

FIRST TERM		CREDITS
AB-112	Collision Repair Welding I	2
AB-113	Collision Repair I/Nonstructural	6
AB-149	Collision Repair Estimating I	2
ABR-125	Collision Repair Refinishing I	6
SECOND TERM		
AB-123	Collision Repair Welding II	2
AB-133	Collision Repair II/ Structural	6
AB-150	Collision Repair Computerized Estimating-Shoplink	2
ABR-127	Collision Repair Refinishing II*	6
THIRD TERM		
AB-222	Collision Repair III/Advanced Structural	6
ABR-129	Collision Repair/Refinishing III	6
<i>Credits required for certificate</i>		44

* Program requirements: AB-112 Collision Repair Welding I and ABR-125 Collision Repair Refinishing I must be completed or be in progress prior to enrolling in ABR-127 Collision Repair Refinishing II.

Computer & Network Administration

Certificate

Associate of Applied Science Degree

The Computer & Network Administration program prepares students for technical support careers specializing in network administration and maintenance. Students may earn either a one-year Certificate of Completion or two-year Associate of Applied Science degree. The course work emphasizes development of analytical and problem-solving skills in addition to specific hardware and software configurations. Cooperative Work Experience (CWE) is supervised real-world employment that supplements the academic classroom environment.

For students interested in pursuing a bachelor's degree, the Computer & Network Administration Associate of Applied Science articulates to a Bachelor of Applied Science in Technology and Management at Oregon Tech.

For information contact Debra Carino, 503-594-3170 or dcarino@clackamas.edu

PROGRAM REQUIREMENTS

Prerequisites for first term classes include completed course work or placement out of BA-131 Introduction to Business Computing, WR-095 Paragraph to Essay and MTH-065 Algebra II. This is an open program. Students may take any class in the program for which they have completed the prerequisite.

PROGRAM OUTCOMES

Computer & Network Administration AAS Degree

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

- demonstrate all the program learning outcomes of the Computer & Network Administration Certificate.
- operate, install, manage, and troubleshoot major server operating systems;
- understand advanced network technologies and implement intricate internetwork infrastructures,
- understand and demonstrate basic computer and network security principles,
- develop, implement, and document an integrated information systems project;
- communicate the importance of professional and ethical responsibilities and be aware of codes of conduct and other sources of guidance for professionally ethical decision making,
- articulate and justify technical solutions to an audience through oral, written, and graphical communication.

PROGRAM OUTCOMES

Computer & Network Administration Certificate Degree

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

- explain basic troubleshooting processes and procedures from initial diagnosis to final documentation and reporting,
- explain and demonstrate how to interact and communicate effectively with people of different technical backgrounds and professional positions,
- operate, install, manage, and troubleshoot major desktop operating systems;
- identify, install, and troubleshoot computer and network hardware components,
- understand fundamental network technologies and implement a basic local area network,
- exhibit good teamwork skills and serve as effective members of project teams.

CAREERS

Career opportunities include network specialist, computer service technician, field engineer, customer service engineer, computer technician, and PC/LAN support specialist.

For information contact Debra Carino, 503-594-3170 or dcarino@clackamas.edu

COMPUTER & NETWORK ADMINISTRATION CERTIFICATE

FALL TERM		CREDITS
CS-140	Introduction to Operating Systems	4
CS-150	Computer Technician Orientation	3
CS-225	Computer End-User Support	3
CS-227	Computer Hardware & Repair	4
WINTER TERM		
CS-179	Networking I	3
CS-228	Computer OS Maintenance & Repair	4
CS-240W	Windows Desktop Administration	3
WR-101 or WR-121	Communication Skills: Occupational Writing English Composition	3-4
SPRING TERM		
CS-229	Networking II	4
CS-240L	Linux Administration	4
CS-279W	Windows Server Administration	4
SUMMER TERM		
CS-125H	HTML & Web Site Design	3
CS-280	Computer Science/CWE	3
MTH-050	Technical Mathematics I	3
— —	Human Relations requirement (see page 68)	3-4
<i>Credits required for certificate</i>		51-53

**COMPUTER & NETWORK ADMINISTRATION
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

Complete certificate program

**COMPUTER & NETWORK ADMINISTRATION
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
CS-135DB	Microsoft Access	3
CS-280	Computer Science/CWE	3
— —	Computer & Network Administration program elective	6-8
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
WINTER TERM		
CS-240M	MacOS Administration	3
CS-275	Database Design	3
CS-284	Network Security	3
CS-288W	Windows Network Administration	4
SPRING TERM		
CS-280	Computer Science/CWE	3
CS-289	Web Server Administration	4
CS-297N	Network Capstone	4
— —	Computer & Network Administration program elective	3-4
<i>Credits required for degree</i>		91-96

COMPUTER & NETWORK ADMINISTRATION PROGRAM ELECTIVES

Complete 9-12 credits from the following:

COURSE	CREDITS
BA-101 or BA-103 or BA-120	Introduction to Business Business Strategies for Computer Consultants Project Management Fundamentals
BA-131	Introduction to Business Computing
BT-177	Microsoft Project
— —	Any computer science course numbered CS-125 or higher

Note: Students may not take more than six credits of CWE in any one term.

Computer Application Support

Certificate

Associate of Applied Science Degree

The Computer Application Support program prepares students for a variety of technical support careers including help desk, training, and design positions. Students may earn either a one-year certificate or a two-year Associate of Applied Science degree. The course work emphasizes development of analytical and problem-solving skills in addition to specific hardware and software configurations. Cooperative work experience (CWE) is supervised real-world experience that supplements the academic classroom environment.

For students interested in pursuing a bachelor's degree, the Computer Application Support Associate of Applied Science articulates to a Bachelor of Applied Science in Technology and Management at Oregon Tech.

For information contact Debra Carino, 503-594-3170 or dcarino@clackamas.edu

PROGRAM REQUIREMENTS

Prerequisites for first term classes include completed course work for CS-120 Survey of Computing, WR-095 Paragraph to Essay and MTH-065 Algebra II or placement in BA-131 Introduction to Business Computing, WR-121 English Composition, and MTH-095 Algebra III. This program is an open program, meaning that students may take any class in the program for which they have completed the prerequisite.

PROGRAM OUTCOMES

Computer Application Support AAS Degree

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

- operate, install, manage, and troubleshoot major desktop operating systems;
- apply sophisticated word processing and spreadsheet development techniques and provide support to businesses using word processing and spreadsheet applications,
- using HTML and CSS, along with current web editing software, to create standards-compliant websites or support a front-end web development team,
- integrate into a help desk or IT support team to provide professional customer service and application training,
- exhibit good teamwork skills and serve as effective members of project teams,
- articulate and justify technical solutions to an audience through oral, written, and graphical communication.

PROGRAM OUTCOMES

Computer Application Support Certificate Degree

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

- operate, install, manage, and troubleshoot major desktop operating systems;

Continued

Computer Application Support continued...

- apply sophisticated word processing and spreadsheet development techniques and provide support to businesses using word processing and spreadsheet applications,
- use HTML and CSS, along with current web editing software, to create standards-compliant websites or support a front-end web development team;
- integrate into a help desk or IT support team to provide professional customer service and application training,
- exhibit good teamwork skills and serve as effective members of project teams,
- articulate and justify technical solutions to an audience through oral, written, and graphical communication.

CAREERS

Career opportunities include web designer, database specialist, software trainer, software installation and maintenance engineer, computer applications specialist, client support representative, customer service engineer, help desk technician or software consultant.

For information contact Debra Carino, 503-594-3170 or dcarino@clackamas.edu

COMPUTER APPLICATION SUPPORT CERTIFICATE

FALL TERM		CREDITS
CS-140	Introduction to Operating Systems	4
CS-150	Computer Technician Orientation	3
CS-225	Computer End-User Support	3
CS-227	Computer Hardware & Repair I	4

WINTER TERM

CS-125H	HTML & Web Site Design	3
CS-135W	Microsoft Word	3
CS-179	Networking I	3
CS-240W	Windows Desktop Administration	3

SPRING TERM

BA-103	Business Strategies for Computer Consultants	3
CS-135I	Advanced Web Design with Dreamweaver	3
CS-135S	Microsoft Excel	3
CS-240L	Linux Administration	4

SUMMER TERM

CS-280	Computer Science/CWE	3
MTH-050	Technical Mathematics I	3
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
— —	Human Relations requirement (see page 68)	3

Credits required for certificate: 51-52

**COMPUTER APPLICATION SUPPORT
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

Complete certificate program.

**COMPUTER APPLICATION SUPPORT
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
ART-225	Computer Graphics I	3
CS-133VB	Visual Basic.NET I	3
CS-135DB	Microsoft Access	3
— —	Focus Area	4-6

WINTER TERM

CS-133S	Introduction to JavaScript & Server Side Scripting	3
CS-195	Flash Web Development	3
CS-275	Database Design	3
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
— —	Focus Area	4-6

SPRING TERM

CS-133VA	Visual Basic for Applications	3
CS-280	Computer Science/CWE	6
— —	Focus Area	4-6
<i>Credits required for degree</i>		91-93

ADDITIONAL COURSES FROM FOCUS AREA

Complete all courses from one of the following Focus Areas:

APPLICATION SUPPORT

COURSE		CREDITS
ART- 226	Computer Graphics II	3
BT-177	Microsoft Project	3
CS-289	Web Server Administration	4
— —	Computer Application Support program elective	3-4

PROGRAMMING

COURSE		CREDITS
CS-161	Computer Science I	4
CS-162	Computer Science II	4
CS-260	Data Structures	4

COMPUTER APPLICATION SUPPORT PROGRAM ELECTIVES

Complete 3-4 credits from the following:

BA-120 Project Management Fundamentals
Any Computer Science course numbered CS-125 or higher

Corrections

Associate of Applied Science Degree

The Corrections program utilizes an interdisciplinary approach, including sociological, psychological and biological behavioral perspectives to provide students with a well-rounded basis for interacting with corrections clients in a variety of correctional settings.

Course work includes cooperative work experience, hands-on experience in a correctional agency to supplement and apply knowledge gained in academic courses.

PROGRAM OUTCOMES

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

- identify the major steps of the criminal justice process,
- define each step in the criminal justice process, and critically analyze how a case proceeds through the system;
- explain the functions of law enforcement and corrections in the United States in terms of historical roots, structure and contemporary issues;
- describe the role of the criminal court system in the United States,
- communicate effectively both verbally and in writing,

- identify conditions that are specific to working with offenders in an institutional or community setting, and develop strategies for coping with those conditions;
- analyze contemporary issues in the adult and juvenile corrections systems in the United States and outline possible responses to those issues.

CAREERS

Career opportunities are generally in jail and prison facilities as well as community corrections agencies and may include correctional officer, correctional counselor and probation and parole officer.

For more information contact Ida Flippo, 503-594-3363 or iflipp@clackamas.edu

CORRECTIONS ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM	CREDITS
CJA-110 Introduction to Law Enforcement	4
CJA-252 Introduction to Restorative Justice	3
WR-121 English Composition	4
— — Corrections program elective	3

WINTER TERM

CJA-120 Judicial Process	3
CJA-243 Drugs, Crime, & the Law	3
MTH-050 Technical Mathematics I	
or MTH-065 Algebra II	3-4
WR-122 English Composition	4

SPRING TERM

CJA-101 Criminology	3
CJA-130 Introduction to Corrections	3
CJA-203 Crisis Intervention	3
CJA-250 Reporting, Recording, & Testifying	4
PSY-219 Introduction to Abnormal Psychology	4

CORRECTIONS ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM	CREDITS
CJA-122 Criminal Law	4
CJA-134 Correctional Institutions	3
CJA-170 Introduction to Field Work in Criminal Justice	3
HE-151 Body & Drugs I	
or HE-205 Youth Addictions	
or HE-255 Body & Alcohol	3
— — Corrections program elective	3

WINTER TERM

CJA-201 Juvenile Delinquency	4
CJA-223 Criminal Justice Ethics	3
HS-156 Interviewing Theory & Techniques	3
HS-211 HIV, TB, & Infectious Diseases	1
CJA-280 Criminal Justice/Corrections/CWE	3

SPRING TERM

CJA-232 Corrections Casework	3
CJA-281 Criminal Justice/Corrections/CWE	3
HS-216 Group Counseling	3
HS-260 Victim Advocacy & Assistance	4
— — Corrections program elective	3

Credits required for degree

90-91

CORRECTIONS PROGRAM ELECTIVES

Students select from the following:

COURSE	CREDITS
COMM-126 Communication Between the Sexes	4
COMM-140 Introduction to Intercultural Communication	4
COMM-218 Interpersonal Communication	4
COMM-227 Nonverbal Communication	4
GRN-183 Death and Dying	3
HDF-260 Understanding Child Abuse and Neglect	3

Any CJA, HS, PHL, PS, PSY, or SOC course not already included in the Correction AAS program.

Juvenile Corrections

Certificate

The Juvenile Corrections Certificate is a one-year program developed in cooperation with the Oregon Youth Authority. Students are prepared to interview for an entry level position in a juvenile correctional facility. The certificate curriculum is challenging and is aimed at providing the skills most desired for working within the juvenile corrections system in Oregon.

Course work includes cooperative work experience, hands-on experience in a correctional agency enabling students to demonstrate the skills and knowledge acquired in the academic courses in a practical manner.

PROGRAM OUTCOMES

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

- explain the function of juvenile corrections in the United States in terms of historical roots, structure and contemporary issues;
- determine causes of juvenile delinquency, and identify system responses based upon the various theories of causation;
- identify conditions that are specific to working with juvenile offenders in an institutional or community setting, and develop strategies for coping with those conditions;
- analyze contemporary issues in the juvenile corrections system in the United States and outline possible responses to those issues,
- communicate effectively both verbally and in writing.

CAREERS

Career opportunities are within secure facilities or in the community and may include youth correctional counselor, juvenile detention officer and group life coordinator.

For more information contact Ida Flippo, 503-594-3363 or iflipp@clackamas.edu

JUVENILE CORRECTIONS CERTIFICATE

FALL TERM	CREDITS
CJA-252 Restorative Justice	3
HE-205 Youth Addictions	3
MTH-050 Technical Mathematics I	
or MTH-065 Algebra II	3-4
PSY-215 Introduction to Developmental Psychology	4
WR-121 English Composition	4

Continued

*Juvenile Corrections continued...***WINTER TERM**

CJA-170	Careers In Criminal Justice Fields	3
CJA-201	Juvenile Delinquency	4
HS-156	Interviewing Theory & Technique	
or PSY-221	Introduction to Counseling	3-4
— —	Juvenile Corrections program elective	3-4

SPRING TERM

CJA-203	Crisis Intervention	3
CJA-232	Corrections Casework	3
CJA-280	Criminal Justice/Corrections/CWE	4
HDF-140	Contemporary American Families	
or SOC-210	Marriage, Family & Intimate Relations	3-4
SOC-205	Social Stratification & Social Systems	
or ED-258	Multicultural Education	
or COMM-140	Intercultural Communication	
or ANT-103	Cultural Anthropology	3-4

Credits required for certificate 46-51

JUVENILE CORRECTIONS PROGRAM ELECTIVES

COURSE		CREDITS
CJA-130	Introduction to Corrections	3
CJA-134	Correctional Institutions	3
CJA-250	Reporting, Recording & Testifying	4
HDF-260	Understanding Child Abuse and Neglect	3
HE-249	Mental Health	3
HS-154	Community Resources	3
HS-211	HIV, TB & Infectious Diseases	1
HS-216	Group Counseling Skills	3

Criminal Justice

Associate of Applied Science Degree

The course work for this two-year program is designed to develop students' knowledge and skills in the areas of law enforcement, courts and corrections. Areas emphasized include community policing, criminal investigation, routine patrol and criminological theory. Students gain an appreciation of the various parts of the criminal justice system and how they function as a whole. Students may enter this program any term.

The course work for this program includes cooperative work experience which affords the student opportunity for hands-on experience with many local, federal and state law enforcement agencies.

PROGRAM OUTCOMES

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

- identify the major steps of the criminal justice process,
- define each step in the criminal justice process, and critically analyze how a case proceeds through the system;
- explain the functions of law enforcement and corrections in the United States in terms of historical roots, structure and contemporary issues;
- describe the role of the criminal court system in the United States,

- communicate effectively both verbally and in writing,
- apply key United States Supreme Court cases to real-life situations,
- develop strategies for coping with stressors associated with working in law enforcement.

CAREERS

Career opportunities include law enforcement officer at the local, state or national level, loss prevention officers and Homeland Security officers. Many departments require college course work or degrees in addition to civil service requirements.

For general information or information about transferring to a four-year institution contact Ida Flippo, 503-594-3363 or iflippo@clackamas.edu

CRIMINAL JUSTICE ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
CJA-110	Introduction to Law Enforcement	4
CJA-200	Community Policing in a Culturally Diverse Society	4
WR-121	English Composition	4
— —	Criminal Justice program electives	3

WINTER TERM

CJA-120	Judicial Process	3
CJA-243	Drugs, Crime, & the Law	3
WR-122	English Composition	4
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II	3-4

SPRING TERM

CJA-101	Criminology	3
CJA-130	Introduction to Corrections	3
CJA-203	Crisis Intervention	3
CJA-250	Reporting, Recording, & Testifying	4
— —	Criminal Justice program electives	3

CRIMINAL JUSTICE ASSOCIATE OF APPLIED SCIENCE DEGREE 2ND YEAR

FALL TERM		CREDITS
CJA-122	Criminal Law	4
CJA-170	Introduction to Field Work in Criminal Justice	3
CJA-210	Criminal Investigation I	3
PSY-219	Introduction to Abnormal Psychology	4

WINTER TERM

CJA-201	Juvenile Delinquency	4
CJA-211	Criminal Investigation II	3
CJA-223	Criminal Justice Ethics	3
CJA-280	Criminal Justice/Corrections/CWE	3
— —	Criminal Justice program electives	3

SPRING TERM

CJA-212	Criminal Investigation III	3
CJA-222	Procedural Law	3
CJA-281	Criminal Justice/Corrections/CWE	3
HE-151	Body & Drugs I	
or HE-205	Youth Addictions	
or HE-255	Body & Alcohol	3
HS-260	Victim Advocacy & Assistance	4

Credits required for degree 90-91

CRIMINAL JUSTICE PROGRAM ELECTIVES

Students select from the following:

COURSE		CREDITS
COMM-126	Communication Between the Sexes	4
COMM-140	Introduction to Intercultural Communication	4
COMM-218	Interpersonal Communication	4
COMM-227	Nonverbal Communication	4
GRN-183	Death and Dying	3
HDF-260	Understanding Child Abuse and Neglect	3

Any CJA, HS, PHL, PS, PSY, or SOC course not already included in the Criminal Justice AAS program.

Dental Assistant

Certificate

The Dental Assistant (DA) program is designed to prepare students for entry level positions in the dental care setting. The goal of the program is to graduate students that have demonstrated competencies in clinical and administrative practices as well as demonstrated work ethics and professional values consistent with that of the American Dental Association (ADA).

PROGRAM REQUIREMENTS AND PREREQUISITES

This limited entry program requires the applicant to meet the program requirements prior to being formally admitted into the program. The requirements are to be completed in a four-phase process, with specific timelines for each phase. Information regarding specific requirements and timelines are located at www.clackamas.edu/healthSciences/

The applicant must follow all steps to be invited to continue through each phase of the admission process, with the final phase resulting in the opportunity to be invited for admission.

DA students will participate in unpaid, supervised externships in the dental care setting.

PROGRAM OUTCOMES

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

- successfully pass the national and state dental assistant exams, required for entry-level positions;
- demonstrate competencies in dental procedures to provide dental care,
- collaborate strategically with others,
- apply current knowledge of aseptic procedures when delivering dental care,
- demonstrate basic competencies in dental administrative practices,
- demonstrate and practice effective communication techniques,
- utilize dental materials for specific dental procedures,
- demonstrate mastery of EFDA skills to obtain certification,
- produce diagnostic quality radiographs,
- assists with medical emergencies in the dental office,
- identify and practice all OSHA policies designed to provide employee protection.

CAREERS

Career opportunities may include but are not limited to managed care facilities, private dental practices, state and county clinics, dental schools and the insurance industry.

Application packets with admission procedures and requirements are available online at: www.clackamas.edu/HealthSciences/DentalAssistant/

For continuing education opportunities for healthcare providers see Healthcare Professional Development (HPD) in the course description section on page 198.

For more information, contact: health-sciences-questions@clackamas.edu

DENTAL ASSISTANT CERTIFICATE

FIRST TERM		CREDITS
DA-101	Dental Radiology I	3
DA-104	Clinical Procedures I	3
DA-107	Dental Materials I	3
DA-110	Clinical Practicum I	1
DA-115	Dental Science	1
DA-125	Dental Infection Control	1
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
SECOND TERM		
CS-120	Survey of Computing	4
DA-102	Dental Radiology II	1
DA-105	Clinical Procedures II	3
DA-108	Dental Materials II	2
DA-120	Clinical Practicum II	5
DA-135	Pharmacology/Medical Emergencies	1
THIRD TERM		
DA-106	Clinical Procedures III	2
DA-130	Clinical Practicum III	8
DA-145	Dental Office Procedures	2
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II	3-4
PSY-101	Human Relations	3

Credits required for certificate 49-51

Dental lab schedules (am/pm) are based on lottery. Information will be provided at orientation.

Current Healthcare Provider level CPR (AHA) are required during practicums and must be taken prior to the first term practicum. All DA students will be required to complete a criminal history background, provide proof of immunization, and students will be asked to take a drug test as arranged by the department.

Note: Students must achieve a C or higher grade in all required courses prior to advancing to the next term.

Core curriculum is sequential and may not be taken out of order. Core curriculum is intended to be completed over three consecutive terms.

Digital Media Communications

Associate of Applied Science Degree

The Digital Media Communications (DMC) degree is designed to successfully prepare students for careers in the expanding fields of digital media productions and communications.

PROGRAM OUTCOMES

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

- employ concepts and use terminology reflecting an understanding of two-dimensional design fundamentals in the context of completed multimedia design and/or artistic projects,
- produce a final multimedia project that demonstrates preparedness for entry into a field related to one of the DMC focus areas, and articulate how that project relates to professional opportunities in that field;
- critically analyze and discuss multimedia works in the context of mass media and society,
- demonstrate an awareness of ethical and legal considerations involved when creating multimedia works, including basic professional skills related to documentation and rights licensing for copyright, fair use, etc.;
- complete digital multimedia video projects illustrating professional entry-level competence in planning, production, and editing tools and techniques;
- create or contribute to a comprehensive digital multimedia project in a way that showcases specialized skills in one or more of the following focus areas: Motion Graphics & Computer Animation, Web Design, Multimedia Journalism, Film Studies, Video Production, Audio & Sound Engineering, or Music & Sound for Media.

CAREERS

Some of the careers available in media include: production designer, art department coordinator, camera operator, writer (general, film and documentary), editor, visual effects production, multimedia producer, sound mixer and recordist, boom operator, post production sound design, duplication, music composer, looping and foley, mobile location recording, voice-over work, audio for interactive multimedia, steadicam operator, assistant editor, weblog contributor, broadcast journalist, podcast writer and production, script supervisor and continuity, videographer, production assistant, graphic artist, photographer (still), location assistant, storyboard artist, art assistant, web designer, electronic news gatherer, web radio program editor, live sound engineer, broadcast reporter and other emerging opportunities.

For information contact Andy Mingo, 503-594-3264 or andym@clackamas.edu

DIGITAL MEDIA COMMUNICATIONS ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
ART-115	Basic Design: Two Dimensional Design	4
DMC-100	Introduction to Media Arts	3
WR-121	English Composition	4
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
— —	Digital Media Communications program electives	4

WINTER TERM

DMC-104	Digital Video Editing	4
J-211	Mass Media & Society	
or COMM-212	Mass Media & Society	4
MTH-065	Algebra II (or higher level of math)	4
COMM-100*	Basic Speech Communication	
or PSY-101	Human Relations	3

SPRING TERM

— —	Focus Area courses	3-8
— —	Digital Media Communications program electives	8

SUMMER TERM

DMC-280	Digital Media Communications/CWE	3
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DIGITAL MEDIA COMMUNICATIONS ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM		CREDITS
HUM-233	Electronic Culture	
or SSC-233	Electronic Culture	4
— —	Focus Area courses	4-6
— —	Digital Media Communications program electives	10

WINTER TERM

— —	Humanities program electives	7
— —	Focus Area courses	6-8

SPRING TERM

BA-146	Entertainment Law & New Media	3
DMC-191	Digital Media Communications Portfolio Project II	
or DMC-192	Digital Media Communications Portfolio Project III	3-4
— —	Focus Area course	4
— —	Digital Media Communications program electives	4

Credits required for degree 90-110

*COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C

ADDITIONAL COURSES FROM FOCUS AREA

Complete all courses from one of the following Focus Areas

MOTION GRAPHICS & COMPUTER ANIMATION

COURSE		CREDITS
ART-106	Animation & Motion Graphics I	
or DMC-106	Animation & Motion Graphics I	3
ART-107	Animation & Motion Graphics II	
or DMC-107	Animation & Motion Graphics II	3
ART-131	Drawing	
or ART-132	Drawing	
or ART-133	Drawing	4
ART-221	Flash Animation: Design & Techniques	3
ART-222	Advanced 2D Animation	3
ART-225	Computer Graphics I	3
ART-226	Computer Graphics II	3
CS-195	Flash Web Development	3

WEB DESIGN

COURSE		CREDITS
ART-116	Basic Design: Color Theory & Composition	4
ART-221	Flash Animation: Design & Techniques	3
ART-227	Computer Graphics III	3
ART-262	Digital Photography & Photo-Imaging	3
BA-103	Business Strategies for Computer Consultants	3
CS-125H	HTML & Web Site Design	3
CS-135I	Advanced Web Design with Dreamweaver	3
CS-195	Flash Web Development	3

MULTIMEDIA JOURNALISM

COURSE		CREDITS
J-134	Photojournalism	4
J-215	College Newspaper Lab: Writing & Photography	3
J-216	Writing for Media	
or J-230	Multimedia Reporting	4
J-220	Introduction to Broadcast Journalism	4
J-221	Broadcast Journalism	
or J-226	Introduction to College Newspaper: Design & Production	4

FILM STUDIES

COURSE		CREDITS
DMC-264	Digital Filmmaking	4
DMC-265	Advanced Digital Filmmaking	4
DMC-195	American Film	
or ENG-195	American Film	4
DMC-295	Revolutionary Film	
or ENG-295	Revolutionary Film	4
ENG-105	Introduction to Literature: Drama	4
WR-262	Introduction to Screenwriting	4

VIDEO PRODUCTION

COURSE		CREDITS
ART-106	Animation & Motion Graphics I	
or DMC-106	Animation & Motion Graphics I	3
DMC-205	Directing for Film & Video	4
DMC-242	Field Recording & Sound Design for Media	1
DMC-247	Music, Sound & Moviemaking	
or MUS-247	Music, Sound & Moviemaking	3
DMC-264	Digital Filmmaking	4
DMC-265	Advanced Digital Filmmaking	4
WR-262	Introduction to Screenwriting	4

AUDIO & SOUND ENGINEERING

COURSE		CREDITS
DMC-147	Music, Sound, and Moviemaking	
or MUS-147	Music, Sound, and Moviemaking	1
DMC-242	Field Recording & Sound Design for Media	1
MUS-101	Music Fundamentals	3
MUS-107	Introduction to Audio Recording I	3
MUS-108	Introduction to Audio Recording II	3
MUS-109	Introduction to Audio Recording III	3
MUS-148	Live Sound Engineering	3

MUSIC & SOUND FOR MEDIA

COURSE		CREDITS
DMC-242	Field Recording & Sound Design for Media	1
DMC-247	Music, Sound, and Moviemaking	
or MUS-247	Music, Sound, and Moviemaking	3
MUS-101	Music Fundamentals	3
MUS-107	Introduction to Audio Recording I	3
MUS-141	Introduction to the Music Business	3
MUS-142	Introduction to Electronic Music I	3

MUS-143	Introduction to Electronic Music II	3
MUS-144	Introduction to Electronic Music III	3
MUS-145	Introduction to Digital Sound, Video & Animation	3

DIGITAL MEDIA COMMUNICATIONS PROGRAM ELECTIVES

COURSE		CREDITS
ART-262	Digital Photography & Photo-Imaging	3
BA-101	Introduction to Business	4
BA-120	Project Management Fundamentals	3
BA-124	Negotiation	3
BA-223	Principles of Marketing	4
COMM-112	Persuasive Speaking	4
COMM-150	Competitive Platform Speaking	4
COMM-167	Parliamentary Procedure	4
CS-125P	Computer Publishing	3
CS-125R	Podcasting	3
DMC-109	Introduction to Stop Motion Animation	1
DMC-180	Digital Media Communications Internship	1-12
DMC-190	Digital Media Communications Portfolio Project I	1-4
DMC-191	Digital Media Communications Portfolio Project II	3
DMC-192	Digital Media Communications Portfolio Project III	4
DMC/ENG-194	Introduction to Film	4
DMC-250	Motion Capture	4
DMC/ENG-296	Adaption: Literature into Film	4
ENG-194	Introduction to Film	4
ENG-279	Focused Drama Study	1
J-134	Photojournalism	4
J-226	Introduction to College Newspaper: Design & Production	4
J-227	Intermediate College Newspaper: Design & Production	4
J-228	Advanced College Newspaper: Design & Production	4
MUS-130	Music Media: Sex, Drugs, Rock & Roll	1
MUS-230	Music Media: Sex, Drugs, Rock & Roll	4
TA-101	Appreciation of Theatre Arts	4
TA-102	Appreciation of Theatre Arts	4
TA-103	Appreciation of Theatre Arts	4
TA-111	Fundamentals of Technical Theatre	4
TA-112	Fundamentals of Technical Theatre	4
TA-113	Fundamentals of Technical Theatre	4
TA-141	Acting I	4
TA-142	Acting II	4
TA-143	Acting III	4
WR-122	English Composition	4
WR-123	English Composition	3
WR-222	English Composition	4
WR-227	Technical Report Writing	4
WR-240	Creative Writing: Nonfiction	4
WR-241	Creative Writing: Fiction	4
WR-242	Creative Writing: Poetry	4
WR-245	Advanced Poetry Writing	4
WR-246	Advanced Creative Writing: Editing & Publishing	4
WR-247	Advanced Playwriting	4
WR-249	Publishing on Land and Online	1
WR-263	Advanced Screenwriting	4

HUMANITIES PROGRAM ELECTIVES

Additional selected humanities electives must be from the following list of prefixes: ANT, ART, DMC, EC, ENG, GEO, HST, J, MUS, PS, PSY, SOC, SSC, WR, WS. Additional Digital Multimedia Communications program electives may be chosen from focus areas not used to meet degree requirements.

Entry Level Multimedia Journalist

Career Pathway Certificate

The Entry Level Multimedia Journalist certificate prepares students for entry level positions in the field of multimedia and journalism. Students attain knowledge and learn skills to seek careers in creative and support professions related to multimedia and broadcast journalism, such as visual and audio editing, multimedia production, post production, weblog and podcast writing and production, broadcast reporting and electronic news gathering.

PROGRAM OUTCOMES

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

- display preparedness for an entry-level position in the field of multimedia journalism by orchestrating multiple news teams, generating newsworthy story ideas, and checking content for problem with libel and newsworthiness;
- demonstrate video production skills and understanding in broadcast Journalism by managing a news crew to follow up and record video news stories, editing video news stories, compressing video into needed formats, uploading and updating video news stories onto an internet server;
- demonstrate skills and understanding in Journalism by writing news stories and taking photographs for publication in the weekly newspaper, working with a peer group toward a common goal, conducting interviews in a professional manner, synthesizing information gathered from sources to put together news articles, writing photo captions with no errors, researching, collecting and evaluating information for use in news stories, practicing ethical journalism in gathering information, and processing advertising contracts;
- demonstrate skills and understanding in digital video editing which include logging and capturing raw video, cutting video sequences into individual shots, assembling shots into cohesive and meaningful order within a timeline, generating text to place into video, adjusting audio levels and apply audio transitions and color correction, discuss the historical cultural impact of the language of film and how that impacts present-day editing decisions, apply established editing techniques and style to a creative video editing project using Premiere Pro, create a digital slide show, produce an audio news story, design and maintain a working news website.

CAREERS

Career opportunities include work in radio, television stations, motion picture industry, as well as advertising and promotions.

For information contact Andy Mingo, 503-594-3264 or andym@clackamas.edu

ENTRY LEVEL MULTIMEDIA JOURNALIST CAREER PATHWAY CERTIFICATE

FALL TERM		CREDITS
DMC-100	Introduction to Media Arts	3
DMC-104	Digital Video Editing	4
J-216	Writing for Media	
or J-230	Multimedia Reporting	4
J-220	Introduction to Broadcast Journalism	4
WINTER TERM		
COMM-100*	Speech Communications	
or PSY-101	Human Relations	3
J-215	College Newspaper Lab: Writing & Photography	3
WR-121	English Composition	4
SPRING TERM		
BA-146	Entertainment Law & New Media	3
DMC-190	Digital Media Communications Portfolio Project I	1
J-211	Mass Media & Society	4
J-221	Broadcast Journalism	
or J-226	Introduction to College Newspaper: Design & Production	4
<i>Credits required for certificate</i>		37

*COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C

Video Production Technician

Career Pathway Certificate

The Video Production Technician certificate prepares students for entry level positions in the field of multimedia video production. Students attain knowledge and learn skills to seek careers in creative and support professions related to multimedia video production, such as visual and audio editing, multimedia production, post production, sound design, duplication production assistant, camera operators, multimedia artists and animators, titling, and motion graphics.

PROGRAM OUTCOMES

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

- create and produce a multimedia production by the following process of logging and capturing raw video, cutting video sequences into individual shots, generating text to place into video and using skills with software to produce a professionally edited video;
- demonstrate skills and understanding in visual editing by assembling shots into cohesive and meaningful order within a timeline and use effects such as video transitions and color correction;
- demonstrate skills and understanding in audio editing by adjusting audio levels and apply audio crossfades,
- demonstrate competency in entry-level positions in the field of multimedia video production,
- display skills and knowledge of software used in the multimedia industry by using the software to create the work and using advanced techniques like, compositing multiple video clips together.

CAREERS

Career opportunities include audio and video equipment technicians; broadcast technician; camera operators; film/video editor; media and communication equipment workers; media and communication workers; and multimedia artists and animators.

For information contact Andy Mingo, 503-594-3264 or andym@clackamas.edu

VIDEO PRODUCTION TECHNICIAN CAREER PATHWAY CERTIFICATE

FALL TERM	CREDITS
ART-106 Animation & Motion Graphics or DMC-106 Animation & Motion Graphics	3
COMM-100* Basic Speech Communications or PSY-101 Human Relations	3
DMC-100 Introduction to Media Arts	3
DMC-104 Digital Video Editing	4
WINTER TERM	
DMC-264 Digital Filmmaking	4
DMC-247 Music, Sound & Moviemaking or MUS-247 Music, Sound & Moviemaking	3
WR-121 English Composition	4
SPRING TERM	
BA-146 Entertainment Law & New Media	3
DMC-190 Digital Media Communications Portfolio Project I	1
DMC-242 Field Recording & Sound Design for Media	1
WR-262 Introduction to Screenwriting	4
<i>Credits required for certificate</i>	33

*COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C

Early Childhood Education & Family Studies

Certificate**Associate of Applied Science Degree**

This program provides a foundation in the ten core knowledge categories: Family and Community Systems; Diversity; Health, Safety and Nutrition; Human Growth and Development; Learning Environments and Curriculum; Observation and Assessment; Personal, Professional and Leadership Development; Program Management; Special Needs; and Understanding and Guiding Behavior (The Oregon Registry, 2008).

Students must obtain a First-Aid certificate with infant-toddler CPR by the end of the first year.

PROGRAM OUTCOMES**Early Childhood Education & Family Studies AAS Degree**

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

- promote children's development and learning by creating and maintaining environments that are healthy respectful, supportive and challenging for each child;
- build family and community partnerships based on understanding and valuing the complex characteristics of children's families and communities,
- observe, document and assess young children;

- implement developmentally effective approaches, depending on children's ages, characteristics and the settings within which teaching and learning occurs;
- use content knowledge to build meaningful curriculum by designing, implementing and evaluating experiences that promote positive development and learning for each and every young child;
- identify and conduct themselves as members of the early childhood profession and be continuous collaborative learners.

PROGRAM OUTCOMES**Early Childhood Education & Family Studies Certificate**

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

- promote children's development and learning by collaborating to create healthy, respectful and supportive environment;
- respect, support and communicate with families,
- observe and document young children,
- define and understand developmentally effective approaches, depending on the children's ages, characteristics and the setting within which teaching and learning occur;
- use content knowledge to understand curriculum by designing and implementing experiences that promote positive development and learning for each and every young child,
- identify and conduct themselves as members of the early childhood community.

CAREERS:

After completing the two-year AAS in Early Childhood Education & Family Studies, students will be prepared to work in a variety of education and family support settings: in-charge teachers in private preschools/kindergartens or teaching assistants (paraeducators) in public school settings (PK-4th Grade and Head Start). Additionally, students will be prepared to work as family support personnel (e.g. family advocates, parent practitioners, family life paraprofessionals, etc.) in various education settings or child and family support agencies.

For information contact Dawn Hendricks, 503-594-6158 or dawn.hendricks@clackamas.edu

EARLY CHILDHOOD EDUCATION & FAMILY STUDIES CERTIFICATE

SUMMER TERM	CREDITS
MTH-050 Technical Mathematics I or MTH-065 Algebra II	3-4
WR-101 Communication Skills: Occupational Writing or WR-121 English Composition	3-4
FALL TERM	
ECE-150 Introduction to Early Childhood Education	3
ECE-235 Nutrition, Music & Movement	3
HDF-225 Prenatal, Infant & Toddler Development	3
HDF-260 Understanding Child Abuse & Neglect	3
— — PE/Health/Safety/First Aid requirement (see page 68)	2-3

Continued

*Early Childhood Education & Family Studies continued...***WINTER TERM**

ECE-121	Observation & Guidance I in ECE Settings	4
ECE-154	Language & Literacy Development	3
ECE-240	Environments & Curriculum Planning I	3
HDF-247	Preschool Child Development	3
— —	Early Childhood Education program electives	3

SPRING TERM

ECE-179	The Professional in Early Childhood Education & Family Studies	2
ECE-239	Helping Children & Families Cope With Stress	3
ECE-280	Early Childhood Education/CWE	3
ED-258	Multicultural Education	3
HDF-140	Contemporary American Families	3
<i>Credits required for certificate</i>		50-53

**EARLY CHILDHOOD EDUCATION & FAMILY STUDIES
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

Complete certificate program.

**EARLY CHILDHOOD EDUCATION & FAMILY STUDIES
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
ECE-221	Observation & Guidance II in ECE Settings	4
ECE-245	Environments & Curriculum Planning II	3
ED-100	Introduction to Education	3
— —	Early Childhood Education program electives	4

WINTER TERM

ECE-289	The Project Approach in Early Childhood Education	1
ED-169	Overview of Students with Special Needs	3
ED 254	Instructional Strategies for Dual Language Learners	3
ED-271	Practicum II/CWE	4
— —	Early Childhood Education program electives	3

SPRING TERM

ECE-177	Maximizing the Outdoors in ECE Curriculum	3
ED-114	Instructional Strategies in Math & Science	3
ED-246	School, Family & Community Relations	4
or SOC-210	Marriage, Family and Intimate Relations	4
ED-272	Practicum III/CWE	4
<i>Credits required for degree</i>		92-95

**EARLY CHILDHOOD EDUCATION & FAMILY STUDIES
PROGRAM ELECTIVES**

COURSE	CREDITS
COMM-100* Basic Speech Communication	3
COMM-105 Listening	4
ECE-135 Self-Esteem in the ECE Classroom	1
ECE-139 Program Management in ECE	1
ECE-142 Media, Technology and the Influences on Child Development	1
ECE-143 Kindergarten Readiness	1
ECE-144 Working with the Gifted Young Child	1
ECE-145 Understanding Superhero Play in the Classroom	1
ED-150 Creative Activities for Children	3
ED-229 Learning & Development	3
ED-235 Educational Technology	3
HS-154 Community Resources	3
HST-138 History of Love, Marriage and the Family	4
PSY-101 Human Relations	3

PSY-205	Psychology as a Social Science	4
PSY-215	Introduction to Developmental Psychology	4
PSY-221	Introduction to Counseling	4
WR-122	English Composition	4
WS-101	Introduction to Women's Studies	4

*COMM-100 may be substituted by taking all of the following:
COMM-100A, COMM-100B and COMM-100C

Family Development

Career Pathway Certificate

The Family Development Career Pathway Certificate is designed to provide paraprofessionals, working within child and family support agencies, with competencies to assist families to become self-reliant and interdependent within the scope of their communities.

PROGRAM OUTCOMES

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

- build family and community partnerships based on understanding and valuing the complex characteristics of families and communities,
- design a strengths-based family development plan,
- promote cooperative solutions to conflicts that families may experience,
- implement respectful, cross-cultural communication strategies when interacting with families,
- assist families in locating resources to achieve their goals,
- conduct family meetings, including home visits, with strengths-based outcomes.

CAREERS

Career opportunities include: family advocates, child care and education practitioners, home visitors and family practitioners, employment and training counselors, community or nutrition workers, home health aides and direct care workers, early intervention staff, outreach workers, crisis intervention staff, intake and social welfare workers, case managers.

For information contact Dawn Hendricks, 503-594-6158 or dawn.hendricks@clackamas.edu

FAMILY DEVELOPMENT CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
HDF-130	Introduction to Family Development	1
HDF-131	Communication in Family Development	1
HDF-132	Self-Care Skills Family Development Workers	1
HDF-133	Diversity in Family Development	1
HDF-134	Strengths-Based Assessment in Family Life Development	1
HDF-135	Setting & Achieving Goals in Family Development	1
HDF-136	Community Resources in Family Development	1
HDF-137	Home Visiting in Family Development	1
HDF-138	Facilitation Skills in Family Development	1
HDF-280	Practicum I: Family Studies/CWE	
or ECE-280	Early Childhood Education/CWE	3
<i>Credits required for certificate</i>		12

Electronics Engineering Technology

Certificate

Associate of Applied Science Degree

Program course work focuses on a traditional electronics foundation, including a basic electronics series, digital logic series, a troubleshooting series, a physics series and a semiconductor linear circuit series. The degree focuses on electronics and engineering design principles and electronics systems and is taught in a team environment whenever possible.

Specific skill areas for the Electronics Engineering Technology degree include test equipment use, computer use, problem-solving, teamwork, understanding math and electronics fundamentals and writing and oral communication.

PROGRAM OUTCOMES

Electronics Engineering Technology AAS Degree

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

- collaborate safely and professionally in an electronic technology-focused workplace,
- use and comprehend standard electronics terminology in communication,
- identify and isolate technology problems,
- identify electronic components including resistors, capacitors, inductors, diodes, transistors, amplifiers and digital logic gates;
- read specifications, symbols, schematics, ladder diagrams and assembly drawings;
- recognize common circuit arrangement like bridges, Darlington pairs, differential pairs;
- comprehend AC, DC, amps, volts, ohms, impedance, watts, frequency, apparent and reactive power;
- operate and interpret oscilloscopes, multimeters, signal generators, power supplies;
- assemble, disassemble, adjust and verify electronic equipment performance;
- use test procedures and test equipment to service and maintain equipment.

PROGRAM OUTCOMES

Electronics Engineering Technology Certificate Degree

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

- safely and professionally collaborate in an electronic technology-focused workplace,
- use and comprehend standard electronics terminology in communication,
- identify electronic components including resistors, capacitors, diodes, transistors, amplifiers, and digital logic gates;
- read specifications, symbols and schematics;
- recognize common circuit arrangements like bridges, Darlington pairs, differential pairs;

- comprehend AC, DC, amps, volts, ohms, impedance, watts, frequency, apparent and reactive power;
- operate and interpret oscilloscopes, multimeters, signal generators, power supplies;
- assemble and disassemble electronic equipment.

CAREERS

Career opportunities may include engineering technician, manufacturing equipment technician, field services technician and operators and processors with large and small employers in high-tech industries.

For information contact the Manufacturing Department, 503-594-3318.

ELECTRONICS ENGINEERING TECHNOLOGY CERTIFICATE

FIRST TERM		CREDITS
EET-112	Electronic Test Equipment & Soldering	3
EET-137	Electrical Fundamentals I	4
MFG-109	Computer Literacy for Technicians	3
MTH-095	Algebra III	4
SM-150	Semiconductor Processing I	2
WR-101*	Communication Skills: Occupational Writing	3
SECOND TERM		
EET-139	Principles of Troubleshooting I	2
EET-141	Electrical Fundamentals II	4
EET-157	Digital Logic I	3
MTH-111	College Algebra	5
— —	Human Relations requirement (see page 68)	3
THIRD TERM		
EET-127	Semiconductor Circuits I	4
EET-142	Electrical Fundamentals III	4
EET-257	Digital Logic II	4
MTH-112	Trigonometry/Pre-Calculus	5
SM-280	Electronics & Microelectronics/CWE	2
Credits required for certificate		55

ELECTRONICS ENGINEERING TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

Complete certificate program.

ELECTRONICS ENGINEERING TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FOURTH TERM		CREDITS
EET-215	Electromechanical Systems I	2
EET-227	Semiconductor Circuits II	3
EET-239	Principles of Troubleshooting II	2
MFG-107	Industrial Safety & First Aid	3
PH-201**	General Physics	5
FIFTH TERM		
EET-250	Linear Circuits	3
EET-252	Control Systems	3
EET-254	Introduction to Microcontrollers	4
MFG-209	Programming & Automation for Manufacturing	3
PH-202**	General Physics	5
SIXTH TERM		
EET-230	Laser and Fiber Optics	3
MFG-133	Programmable Logic Controllers	3
PH-203**	General Physics	5
SM-280	Electronics & Microelectronics/CWE	2
— —	Electronics Engineering Technology program electives	3

Credits required for degree

104

Continued

Electronics Engineering Technology continued...

ELECTRONICS ENGINEERING TECHNOLOGY PROGRAM ELECTIVES:

Any course with a CDT, EET, MFG, MET, RET, SM, or WLD prefix not already in the Electronics Engineering Technology program.

*Substitute college transfer courses for these courses if you plan to continue your education at a higher education institution. It is recommended that you consult with a faculty advisor or a staff member in Student Services for the transfer requirements of the specific advanced program or school.

**The General Physics with Calculus series PH-211/212/213 may be substituted.

ELECTRONICS ENGINEERING TECHNOLOGY (Oregon Tech transfer courses)

The CCC Manufacturing Technology Department, in partnership with Oregon Tech, offers a number of transferable classes into Oregon Tech's Electronics Engineering Technology degree program.

For information contact the Manufacturing Department, 503-594-3318.

Emergency Management

Associated of Applied Science Degree

Emergency Management course work prepares a student to make decisions, problem solve, communicate effectively and coordinate all sources necessary for preparedness, mitigation, response and recovery for any possible emergency or disaster. A program description and list of approved courses can be found on the Criminal Justice/Emergency Management website:

www.clackamas.edu/HumanServices/EmergencyManagement/

For information call 503-594-3207.

PROGRAM OUTCOMES

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

- identify the components of the National Incident Management System (NIMS),
- describe the duties and functions of each of the major roles within the Incident Command System (ICS),
- discuss the role of non-professional responders in emergency management,
- chart the interaction between federal, state, local and tribal agencies when managing an emergency,
- list the uses of emergency management exercises for improving emergency preparedness,
- demonstrate skills necessary to function as an Emergency Management professional.

CAREERS

Career opportunities include local emergency manager, FEMA worker, public safety manager, Homeland Defense Agency worker and risk assessment manager.

For information contact Yvonne Smith, 503-594-3207 or yvonne@clackamas.edu

Emergency Medical Technology

Certificate

Emergency Medical Technicians (EMTs) give immediate care to critically ill or injured people in the pre-hospital setting and provide transport to hospitals, care facilities and private residences. The ability to work under pressure in challenging environments, think critically to make difficult decisions independently and perform life-saving skills precisely are essential to success in this career. A criminal history background check, immunizations, and drug testing will be required.

EMTs in Oregon must be licensed by the state through the Oregon Health Authority, EMS & Trauma Systems Section (OHA/EMS). National certification is available through the National Registry of EMTs (NREMT). Each certification requires approved continuing education classes in emergency care for certification renewal. The CCC Emergency Medical Technology (EMT) certificate program includes the required Oregon license and national EMT certification.

PROGRAM OUTCOMES

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

- demonstrate the ability to safely provide immediate care to the critically ill patients or injured people in the pre-hospital setting,
- demonstrate the ability to be an effective member of a 911 emergency medical response team,
- demonstrate the ability to safely transport sick and injured person to emergency medical facilities,
- effectively evaluate each situation and administer basic and advance life support care, including patient extrication;
- demonstrate the ability to properly document patient information, treatment plans and patient progress in the pre-hospital setting;
- demonstrate the ability to apply the laws and rules relevant to emergency responders,
- become an Oregon licensed and National Certified EMT, preparing for entry-level employment within Oregon.

CAREERS

Career opportunities that may require EMT training include but are not limited to: firefighter (career or volunteer), paramedic, search and rescue, critical care transport or basic life support transport provider. The EMT certificate can lead to a career as a paramedic if a student wishes to continue their studies and completes the requirements for an AAS-EMT (Associate of Applied Science - EMT) degree at an accredited institution.

For continuing education opportunities for healthcare providers see Healthcare Professional Development (HPD) in the course description section on page 198.

For information contact the EMT program director at 503-594-0696 or department at 503-594-0650.

EMERGENCY MEDICAL TECHNOLOGY CERTIFICATE

FALL TERM		CREDITS
BI-231	Human Anatomy & Physiology I	4
COMM-111	Public Speaking	4
EMT-101*	EMT Part I	5
EMT-105	Introduction to Emergency Medical Services	3
MTH-065	Algebra II	4
WINTER TERM		
BI-232	Human Anatomy & Physiology II	4
EMT-102	EMT Part II	5
EMT-109	Emergency Response Communication/Documentation	2
MA-110	Medical Terminology	3
WR-121	English Composition	4
SPRING TERM		
BI-233	Human Anatomy & Physiology III	4
CJA-203	Crisis Intervention	3
CS-120	Survey of Computing	4
EMT-107	EMT Rescue	3
EMT-108	Emergency Response Patient Transportation	2
SOC-205	Social Stratification & Social System	4
<i>Credits required for certificate</i>		58

*Instructor consent required.

Current Healthcare Provider level CPR (AHA or ASHI) are required; criminal history background check, proof of immunization, and students will be asked to take a drug test as arranged by the department.

Employment Skills Training

Certificate

The Employment Skills Training Certificate provides a quick entry strategy for learning the knowledge and skills necessary to start or change a career path.

The certificate combines college courses with specified hands-on instruction at a local employer to improve employability. The student's goals and needs are combined with information from employers, the labor market and the college to determine the knowledge and skills needed to obtain employment in a specific occupation. The student receives an individualized Employment Skills Training (EST) plan.

In addition to preparing a person for employment, the individualized EST plan guides the student in gaining more education and training which develops the student's career path. The program is open entry/open exit, allowing students to begin any term.

PROGRAM REQUIREMENTS

An EST plan must be developed with and approved by a department's faculty advisor.

All of the college's collegiate level credit courses are eligible to be included in the certificate. Developmental courses may be included as prerequisites in a plan but can not be part of the EST certificate.

PROGRAM OUTCOMES

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

- demonstrate the knowledge developed on-the-job and in the classroom,

- complete an individualized career plan,
- demonstrate employment skills, job search skills, career management skills and/or introductory contact with an employer(s) and/or hiring manager.

CAREERS

Completion of an EST certificate can impact any career.

For information contact Student Academic Support Services Department, 503-594-3475, or www.clackamas.edu/Advising/

Energy & Resource Management

Certificate

Associate of Applied Science Degree

The Energy & Resource Management (ERM) program prepares students for entry-level careers in the utility, energy and resource industries. The program will prepare graduates for employment in the energy industry by emphasizing current concepts in traditional and alternative energy generation, distribution, management and leadership. The ERM program is endorsed by the Utility Training Alliance (UTA) comprised of Portland General Electric and Clackamas Community College.

PROGRAM REQUIREMENTS

Students who wish to participate in the Energy & Resource Management (ERM) program are welcome to register for the ERM classes once all prerequisites are met.

Students are advised of the necessary utility industry standards for math, writing, reading, and computer skills required for the successful completion of this program.

Prior to registration in the ERM courses, students must meet the following:

- Pass RD-090 or placement in RD-115, pass WR-095 or placement in WR-121, pass MTH-060 or placement in MTH-065 and pass CS-090 or placement in CS-120.
- Pass ERM-121 with a C or better.
- Meet with EURM Department Advisor.

PROGRAM OUTCOMES

Energy & Resource Management AAS Degree

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

- describe the current and potential applications of renewable energy resources through the energy and resource industries, such as the renewable energy impact on generation, transmission, distribution, transportation and end-use in buildings;
- analyze and describe various methods for generating electricity and power distribution throughout the Northwest; coal, natural gas, nuclear, hydro, diesel powered plants, wind, solar, geothermal and wave energy resources;
- discuss management and leadership strategies to deal with major issues faced in the energy and resource industries,

Continued

Energy & Resource Management continued...

- develop and customize a working portfolio to record the application of knowledge and skills acquired from their education, work history and this program which may relate to their current and future career path in the energy and resource industries;
- prepare and test for the National Career Readiness Certificate (NCRC) by practicing on the WIN website application,
- articulate principles and concepts that govern safe work practices in the utility industry,
- identify and demonstrate personal health and safety within industry standards,
- earn a CPR/First Aid/AED certification.

PROGRAM OUTCOMES*Energy & Resource Management Certificate Degree*

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

- explain basic principles of alternating and direct current as it affects electrical flow and the generation sources of electricity, transmission, and final delivery to the consumer;
- discuss the various methods for generating electricity and power distribution throughout the Northwest such as coal, natural gas, nuclear, hydro, diesel powered plants, and the path to emerging technologies such as wind, solar, geothermal and wave energy resources;
- develop and customize a working portfolio to record the application of knowledge and skills acquired from their education, work history and this program which may relate to their current and future career path in the energy and resource industries;
- prepare and test for the National Career Readiness Certificate (NCRC) by practicing on the WIN website application,
- articulate principles and concepts that govern safe work practices in the utility industry,
- identify and demonstrate personal health and safety within industry standards,
- earn a CPR/First Aid/AED certification.

Students will have additional related elective courses to strengthen their base knowledge on specific topics which enhance the overall outcome of this degree. Students will also earn the Project Management Leadership & Communication Career Pathways Certificate (See page 129.) with the successful completion of second year coursework and applying with a separate petition for graduation.

CAREERS

Career opportunities may include: customer service representative, technician operator, support personnel, utilities assistant, resource specialist, business administration and project management.

For information contact:

Angie Sandercock, EURM Department Advisor
503-594-0944 or angies@clackamas.edu

Shelly Tracy, Wilsonville Campus Director
503-594-0945 or shellyt@clackamas.edu

OREGON TECH TRANSFER AGREEMENT

Graduates from CCC's Energy & Resource Management AAS Degree may transfer with a maximum of 60 credits to Oregon Tech's Bachelor of Applied Science (BAS) in the Technology and Management program. Admission to Oregon Tech is not guaranteed. Transfer students must apply for admission to Oregon Tech in accordance with policies and procedures of Oregon Tech. Students are responsible for notifying the Oregon Tech Admissions and Registrar's Office to ensure their credits transfer. Students must be attending Clackamas Community College during the current catalog year and must enroll at Oregon Tech within three years of the current catalog year.

ENERGY & RESOURCE MANAGEMENT CERTIFICATE:

FALL TERM		CREDITS
BA-131	Introduction to Business Computing	4
ERM-100	Introduction to Utility Industry & Career Options	3
ERM-107	Career Portfolio	4
ERM-109	Career Interview Strategies	1
ERM-110	OSHA 10 Training	1
ERM-160	Utility Industry Health Awareness	3
HE-261	Community CPR	1
WINTER TERM		
ERM-101	History of Energy Industry in the Pacific Northwest	3
ERM-102	Electricity Fundamentals in the Utility Industry	3
MFG-104	Blueprint Reading	2
MFG-130	Basic Electricity I	3
WR-121	English Composition	4
SPRING TERM		
BA-285	Human Relations in Business	4
COMM-111	Public Speaking	4
ERM-103	Fossil Fuels in the Utility Industry	3
MTH-065	Algebra II or higher level of math	4
<i>Credits required for certificate</i>		47

**ENERGY & RESOURCE MANAGEMENT
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

Complete certificate program.

**ENERGY & RESOURCE MANAGEMENT
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
BA-122	Teamwork	3
BA-123	Leadership & Motivation	3
ERM-201	Energy Applications I: Renewable Energy Resources	4
— —	Energy & Resource Management program electives	3-4
WINTER TERM		
BA-205	Business Communications with Technology	4
EC-201	Principles of Economics: MICRO	4
ERM-202	Energy Applications II: Leadership	4
— —	Energy & Resource Management program electives	4
SPRING TERM		
BA-124	Negotiation	3
ERM-203	Energy Applications III: Energy Issues	4
ERM-280	Energy & Utility Resource Management/CWE	3
— —	Energy & Resource Management program electives	4
<i>Credits required for degree</i>		90-91

ENERGY & RESOURCE MANAGEMENT PROGRAM ELECTIVES

COURSE		CREDITS
ART-131	Drawing	4
ART-132	Drawing	4
ART-133	Drawing	4
BA-119	Project Management Practices	2
CDT-102	Sketching & Problem Solving	1-3
EET-112	Electronic Test Equipment & Soldering	3
EET-137	Electrical Fundamentals I	4
ERM-111	Flagging-Work Zone Protection	1
ERM-161	Utility Industry Safety Development	4
ERM-162	Groundworker Training	3
ERM-163	Initial Pole Climbing	4
GIS-201	Introduction to Geographic Information System	3
GIS-232	Data Collection & Application	3
MFG-131	Basic Electricity II	3
MFG-132	Basic Electricity III	3
MTH-095	Algebra III	4
MTH-111	College Algebra	5
MTH-112	Trigonometry/Pre-Calculus	5
MTH-251	Calculus I	5
MTH-252	Calculus II	5
MTH-253	Calculus III	5
MTH-254	Vector Calculus	5
MTH-256	Differential Equations	4
MTH-261	Linear Algebra	4
WR-121	English Composition	4
WR-122	English Composition	4
WR-123	English Composition	3
WR-222	English Composition	4
WR-227	Technical Report Writing	4

Occupational Health & Safety

Career Pathway Certificate

The Occupational Health and Safety Career Pathway program provides training that prepares students for entry-level positions within the utility industry. It is important to be physically fit, to work well in a team environment, adhere to safety requirements and maintain ethical conduct in all work practices. The Occupational Health and Safety Career Pathway Certificate is offered as part of the Energy and Resource Management Program. This certificate is endorsed by the Utility Training Alliance (UTA) comprised of Portland General Electric (PGE), and Clackamas Community College.

PROGRAM REQUIREMENTS

Students who wish to participate in the Occupational Health and Safety program are welcome to register for the ERM classes once all prerequisites are met.

Students are advised of the necessary utility industry standards for math, writing, reading, and computer skills required for the successful completion of this program.

PRIOR TO REGISTRATION IN THE ERM COURSES, STUDENTS MUST MEET THE FOLLOWING:

- Must be 18 years or older
- Pass RD-090 or placement in RD-115, pass WR-095 or placement in WR-121, pass MTH-060 or placement in MTH-065 and pass CS-090 or placement in CS-120
- Pass ERM-121 with a C or better
- Meet with EURM Department Advisor

PROGRAM OUTCOMES

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

- identify and demonstrate a working knowledge of personal health and safety practices by using fire extinguishers, tie ropes and knots, OSHA 10, Personal Protective Equipment (PPE), and ladder safety;
- develop and customize a working portfolio to record the application of knowledge and skills they've acquired from their education, work history and this program which may relate to their current and future career path in the energy and resource industries;
- prepare and test for the National Career Readiness Certificate (NCRC) by practicing on the WIN website application,
- articulate principles and concepts that govern safe work practices in the utility industry,
- identify and demonstrate personal health and safety within industry standards;
- earn a CPR/First Aid/AED certification.

CAREERS

Career opportunities may include: flagger, extraction worker's helper, meter reader and utility locator-damage prevention specialist.

For information contact:

Angie Sandercock, EURM Department Advisor
503-594-0944 or angies@clackamas.edu

Shelly Tracy, Wilsonville Campus Director
503-594-0945 or shellyt@clackamas.edu

OCCUPATIONAL HEALTH AND SAFETY CAREER PATHWAY CERTIFICATE

FALL TERM		CREDITS
ERM-100	Introduction to Utility Industry and Career Options	3
ERM-107	Career Portfolio	4
ERM-109	Career Interview Strategies	1
ERM-110	OSHA 10 Training	1
ERM-111	Flagging-Work Zone Protection	1
ERM-160	Utility Industry Health Awareness	3
HE-261	Community CPR	1
<i>Credits required for certificate</i>		14

Utility Workforce Readiness

Career Pathway Certificate

The Utility Workforce Readiness Career Pathway program provides training that prepares students for entry-level positions in technical careers within the utility industry. It is important to be physically fit, to work well in a team environment, adhere to safety requirements and maintain ethical conduct in all work practices. The Utility Workforce Readiness Career Pathway Certificate is offered as part of the Energy and Resource Management Program. This certificate is endorsed by the Utility Training Alliance (UTA) comprised of Portland General Electric (PGE) and Clackamas Community College.

This program is approved by the Oregon State Apprentice & Training Council (OSATC) Division of the Bureau of Labor & Industries (BOLI) as an authorized Pre-Apprenticeship program.

PROGRAM REQUIREMENTS

Students who wish to participate in the Utility Workforce Readiness program are welcome to register for the ERM classes once all prerequisites are met.

Students are advised of the necessary utility industry standards for math, writing, reading, computer skills and the physical capability required for the successful completion of this program.

Prior to registration in the ERM courses, students must meet the following:

- Must be 18 years or older
- Possess a valid driver's license and CDL permit
- Capable of strenuous physical activity
- Pass RD-090 or placement in RD-115, pass WR-095 or placement in WR-121, pass MTH-060 or placement in MTH-065 and pass CS-090 or placement in CS-120.
- Pass ERM-121 with a C or better.
- Meet with EURM Department Advisor.

PROGRAM OUTCOMES

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

- demonstrate the hands-on skills needed and describe the core knowledge required to acquire entry-level positions within the utility industry,
- identify and comply with all laws and performance standards, and produce reliable results to blend safety and performance into a unified work practice by identifying and demonstrating health and safety practices both personally and as a team,
- demonstrate a working knowledge of utility tools of the trade: use of fire extinguishers, tie ropes and knots, trenching and shoring, chain saw, basic rigging, operating a fork lift, OSHA 10, Personal Protective Equipment (PPE), ladder safety, electrical hazard awareness, and pole identification;

- develop and customize a working portfolio to record the application of knowledge and skills they've acquired from their education, work history and this program which may relate to their current and future career path in the energy and resource industries;
- prepare and test for the National Career Readiness Certificate (NCRC) by practicing on the WIN website application,
- articulate principles and concepts that govern safe work practices in the utility industry, identify and demonstrate personal health and safety within industry standards;
- earn a CPR/First Aid/AED certification.

CAREERS

Career opportunities may include: ground worker, general laborer, flagger, service technician, store room, general maintenance and repair workers, hydro maintenance, telcom construction or technical assistant. It also will prepare students to enter a utility industry apprenticeship.

For information contact:

Angie Sandercock, EURM Department Advisor
503-594-0944 or angies@clackamas.edu

Shelly Tracy, Wilsonville Campus Director
503-594-0945 or shellyt@clackamas.edu

UTILITY WORKFORCE READINESS CAREER PATHWAY CERTIFICATE

FIRST TERM		CREDITS
ERM-100	Introduction to Utility Industry & Career Options	3
ERM-107	Career Portfolio	4
ERM-109	Career Interview Strategies	1
ERM-110	OSHA 10 Training	1
ERM-111	Flagging-Work Zone Protection	1
ERM-160	Utility Industry Health Awareness	3
ERM-161	Utility Industry Safety Development	4
HE-261	Community CPR	1
MTH-065	Algebra II or higher level of math	4
Credits required for certificate		22

Utility Field Technician

Career Pathway Certificate

The Utility Field Technician Career Pathway program provides training that prepares students for entry-level positions in technical careers within the utility industry. It is important to be physically fit, to work well in a team environment, adhere to safety requirements and maintain ethical conduct in all work practices. The Utility Field Technician Career Pathway Certificate is offered as part of the Energy and Resource Management Program. This certificate is endorsed by the Utility Training Alliance (UTA) comprised of Portland General Electric (PGE), and Clackamas Community College.

PROGRAM REQUIREMENTS

Students who wish to participate in the Utility Field Technician program are welcome to register for the ERM classes once all prerequisites are met.

Students are advised of the necessary utility industry standards for math, writing, reading, computer skills and the physical capability required for the successful completion of this program.

PRIOR TO REGISTRATION IN THE ERM COURSES, STUDENTS MUST MEET THE FOLLOWING:

Must be 18 years or older

- Possess a valid driver's license and CDL permit
- Capable of strenuous physical activity
- Pass RD-090 or placement in RD-115, pass WR-095 or placement in WR-121, pass MTH-060 or placement in MTH-065 and pass CS-090 or placement in CS-120
- Pass ERM-121 with a C or better
- Meet with EURM Department Advisor

PROGRAM OUTCOMES

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

- demonstrate the hands-on skills needed and describe the core knowledge required to acquire entry-level positions within the utility industry,
- identify and comply with all laws and performance standards,
- produce reliable results to blend safety and performance into a unified work practice by identifying and demonstrating health and safety practices both personally and as a team,
- demonstrate a working knowledge of utility tools of the trade: use of fire extinguishers, tie ropes and knots, trenching and shoring, chain saw, basic rigging, operating a forklift, OSHA 10, Personal Protective Equipment (PPE), ladder safety, electrical hazard awareness, pole identification;
- incorporate blue print reading and basic electricity theories into every day work practices,
- develop and customize a working portfolio to record the application of knowledge and skills they've acquired from their education, work history and this program which may relate to their current and future career path in the energy and resource industries;
- prepare and test for the National Career Readiness Certificate (NCRC) by practicing on the WIN website application,
- articulate principles and concepts that govern safe work practices in the utility industry,
- identify and demonstrate personal health and safety within industry standards,
- earn a CPR/First Aid/AED certification,
- have taken an additional related elective course in order to strengthen their base knowledge on specific topics which enhance the overall outcome of this certificate.

CAREERS

Career opportunities may include: field technician, service technician, flagger, store room, telcom construction, or technical assistant.

For information contact:

Angie Sandercock, EURM Department Advisor
503-594-0944 or angies@clackamas.edu

Shelly Tracy, Wilsonville Campus Director
503-594-0945 or shellyt@clackamas.edu

UTILITY FIELD TECHNICIAN PATHWAY CAREER PATHWAY CERTIFICATE

FALL TERM		CREDITS
ERM-100	Introduction to Utility Industry and Career Options	3
ERM-107	Career Portfolio	4
ERM-109	Career Interview Strategies	1
ERM-110	OSHA 10 Training	1
ERM-111	Flagging-Work Zone Protection	1
ERM-160	Utility Industry Health Awareness	3
ERM-161	Utility Industry Safety Development	4
WINTER TERM		
BA-119	Project Management Practices	2
HE-261	Community CPR	1
MFG-104	Blueprint Reading	2
MFG-130	Basic Electricity	3
MTH-065	Algebra II (or higher level math)	4
— —	Energy & Resource Management program elective	3-4
<i>Credits required for certificate</i>		32-33

Utility Trade Preparation: Lineworker

Certificate

The Utility Trade Preparation: Lineworker program prepares students to enter the outside line construction industry with the core required skills, knowledge and safety awareness for initial entry-level employment requirements. It is important to be physically fit, work well in a team environment, adhere to safety requirements and maintain ethical conduct in all work practices.

This certificate is endorsed by the Utility Training Alliance (UTA) comprised of Portland General Electric (PGE) and Clackamas Community College.

PROGRAM REQUIREMENTS

Students who wish to participate in the Utility Trade Preparation: Lineworker program are welcome to register for the ERM classes once all prerequisites are met.

Students are advised of the necessary utility industry standards for math, writing, reading, computer skills and the physical capability required for the successful completion of this program.

Prior to registration in the ERM courses, students must meet the following:

- Must be 18 years or older
- Possess a valid driver's license and CDL permit
- Capable of strenuous physical activity
- Physically able to climb utility poles
- Comfortable with heights of up to 60 feet
- Pass RD-090 or placement in RD-115, pass WR-095 or placement in WR-121, pass MTH-060 or placement in MTH-065, and pass CS-090 or placement in CS-120
- Pass ERM-121 with a C or better
- Meet with EURM Department Advisor.

Continued

*Utility Trade Preparation: Lineworker continued...***PROGRAM OUTCOMES**

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

- demonstrate the hands-on skills needed and describe the core knowledge needed to acquire entry-level positions within the utility industry,
- identify and comply with all laws and performance standards, and produce reliable results to blend safety and performance into a unified work practice by identifying and demonstrating personal health and safety practices;
- demonstrate an advanced working knowledge of utility tools of the trade: use of fire extinguishers, tie ropes and knots, trenching and shoring, chain saw, advanced rigging, operating a forklift, running an excavator, OSHA 10, Personal Protective Equipment (PPE), ladder safety, electrical hazard awareness, pole identification, and advanced Groundworker practices which includes building cross arms, using mathematical equations to complete setting poles and guy wires;
- demonstrate how to safely climb, maneuver and perform work on a utility pole, and be able to incorporate blue print reading and basic electricity theories into every day work practices;
- develop and customize a working portfolio to record the application of knowledge and skills acquired from their education, work history and this program which may relate to their current and future career path in the energy and resource industries;
- prepare and test for the National Career Readiness Certificate (NCRC) by practicing on the WIN website application,
- articulate principles and concepts that govern safe work practices in the utility industry, identify and demonstrate personal health and safety within industry standards;
- earn a CPR/First Aid/AED certification.

CAREERS

Career opportunities include: ground worker, general laborer, flagger, service technician, store room, maintenance and repair workers, power line clearance, maintenance and repair workers, telcom construction and installation, general laborer or technical assistant. It also will prepare students to enter a utility industry apprenticeship.

For information contact:

Angie Sandercock, EURM Department Advisor
503-594-0944 or angies@clackamas.edu

Shelly Tracy, Wilsonville Campus Director
503-594-0945 or shellyt@clackamas.edu

UTILITY TRADE PREPARATION: LINEWORKER CERTIFICATE

FIRST TERM		CREDITS
ERM-100	Introduction to Utility Industry & Career Options	3
ERM-107	Career Portfolio	4
ERM-109	Career Interview Strategies	1
ERM-110	OSHA 10 Training	1
ERM-111	Flagging-Work Zone Protection	1
ERM-160	Utility Industry Health Awareness	3
ERM-161	Utility Industry Safety Development	4
MTH-065	Algebra II (or higher level math)	4
WINTER TERM		
BA-119	Project Management Practices	2
MFG-104	Blueprint Reading	2
MFG-130	Basic Electricity	3
ERM-162	Groundworker Training	3
ERM-163	Initial Pole Climbing	4
HE-261	Community CPR	1
<i>Credits required for certificate</i>		36

Fire Science (Wildland)

Certificate

The Fire Science (Wildland) program provides training that can lead to seasonal employment in wildland firefighting or to the first step to a career in the forest industry or park service. There are many career tracks in the field of wildland firefighting and forestry. It's exciting work that requires fundamental survival, safety and firefighting training and skills. It is also important to be physically fit, work well in a team environment, and respond quickly and efficiently to instruction/commands.

Clackamas Community College is a certified training site recognized by the Pacific Northwest Wildfire Coordinating Group (PNWCG), the Oregon Department of Forestry, and National Forest Service. Program instructors are National Wildfire Coordinating Group (NWCG) certified and offer 15-30 years of wildland firefighting experience. Many of the courses carry NWCG certification as well as college credit.

PROGRAM OUTCOMES

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

- demonstrate the basic knowledge of wildland fire behavior,
- recognize situations where safety may be at risk and take appropriate actions to insure personal safety,
- apply the fundamental skills necessary to work as a wildland firefighter at the Firefighter 2 level, working as a member of a hand crew or engine crew;
- demonstrate an understanding of basic forest management.

CAREERS

The certificate can lead to careers as a wildland firefighter, forest and conservation technician, forest fire inspector or investigator, forest fire prevention specialist, independent firefighting contractor or employment in the timber industry.

For information contact Yvonne Smith, 503-594-3207 or yvannes@clackamas.edu; Tom Laugle, 503-594-3066 or toml@clackamas.edu or visit www.clackamas.edu/firescience/

FIRE SCIENCE (WILDLAND) CERTIFICATE

FIRST TERM		CREDITS
FRP-101	Basic Forest Management	3
FRP-102	Basic Forest Management Lab	1
FRP-130	Introduction to Wildland Firefighting (S130/S190)	3
FRP-243	Survivor I: Map, Compass, GPS	2
HD-120	New Student College Success	1
WR-121	English Composition	
or WR-101	Communication Skills: Occupational Writing	3-4
— —	Fire Science (Wildland) program electives	2-5
SECOND TERM		
ESH-100	Environmental Regulations	3
FRP-211	Portable Pumps & Water Use (S-211)	1
FRP-216	Driving for the Fire Service (S-216)	2
FRP-244	Survivor II: Wilderness	2
FRP-246	Survivor IV: Wilderness First Aid	2
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II	3-4
— —	Human Relations requirement (see page 68) (Recommended: PSY-101)	3
THIRD TERM		
FRP-110	Basic Wildland Fire Investigation (FI-110)	1
FRP-180	Wildland Firefighting/CWE	6
FRP-201	Advanced Forest Management	3
FRP-212	Wildfire Power Saws (S-212)	2
FRP-245	Survivor III: Weather of the NW	2
FRP-270	Basic Air Operations (S-270)	1
<i>Credits required for certificate</i>		46-51

FIRE SCIENCE (WILDLAND) PROGRAM ELECTIVES

COURSE		CREDITS
BI-103	General Biology; Plants & the Ecosystem	4
EMT-101	EMT Basic Part I	5
EMT-102	EMT Basic Part II	5
EMT-107	EMT Rescue	3
FRP-131	Advanced Firefighter Training (S-131)	1
FRP-200	Basic Incident Command (I-200)	1
FRP-205	Forest Management Assessments & Inventories	3
FRP-220	Initial Attack Incident Commander (S-200)	1
FRP-230	Crew Boss, Single Resource (S-230)	2
FRP-231	Engine Boss (S-231)	1
FRP-247	Survivor V: Dangerous Animals	2
FRP-248	Survivor VI: Introduction to Search and Rescue	2
FRP-249	Leadership for Firefighters (L-280)	2
FRP-259	Task Force/Strike Team Leader (S-330)	2
FRP-290	Intermediate Fire Behavior (S-290)	3
FRP-294	Intermediate Incident Command System (I-300)	2
FPR-295	Advanced ICS: ICS for Command and General Staff & Complex Incidents (I-400)	2
FPR-296	Introduction to Wildland Fire Behavior Calculations (S-390)	3
GIS-201	Introduction to Geographic Information Systems	3
GIS-232	Data Collection & Application	3
GIS-281	ArcGIS I	3
GIS-282	ArcGIS II	3

Wilderness Survival and Leadership

Career Pathway Certificate

The Wilderness Survival and Leadership program is designed for those students who would like to pursue a variety of careers in the outdoors. Students will understand leadership, survival and rescue in the wilderness. The certificate is part of the Wildland Fire career pathway.

PROGRAM OUTCOMES

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

- demonstrate appropriate search and rescue methods including evacuation techniques,
- demonstrate first aid skills used in the field,
- discuss the basics of land navigation and Northwest weather prediction,
- articulate the knowledge areas required for an understanding of wilderness preparedness,
- prepare helicopter landing zones.

CAREERS

This program prepares students for employment in parks and recreation, guide services, search and rescue, state and federal agencies, private organizations, forestry jobs and wildland firefighting. The certificate gives students the necessary skills to lead and/or participate in any programs in a wide variety of settings that require leadership and competency in the outback regions of the Northwest.

For more information contact Tom Laugle, 503-594-3066 or toml@clackamas.edu or visit: www.clackamas.edu/Programs/Wilderness-Survival-and-Leadership.aspx

**WILDERNESS SURVIVAL AND LEADERSHIP
CAREER PATHWAY CERTIFICATE**

COURSE		CREDITS
FRP-243	Survivor I: Maps, Compass, GPS	2
FRP-244	Survivor II: Wilderness	2
FRP-245	Survivor III: Weather of the NW	2
FRP-246	Survivor IV: Wilderness First Aid	2
FRP-247	Survivor V: Dangerous Animals	2
FRP-248	Survivor VI: Introduction to Search & Rescue	
or FRP-130	Introduction to Wildland Firefighting (S-130/S-190)	2-3
<i>Credits required for certificate</i>		<i>12-13</i>

Note: Courses do not need to be taken in sequence.

Wildland FireFighter 1

Career Pathway Certificate

This program will provide students the opportunity to gain the skills necessary to prepare them for entry-level jobs in the wildland firefighting industry. The courses will be offered over three terms so students will be ready for employment late spring.

PROGRAM OUTCOMES

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

- demonstrate the ability to function as a Wildland Fire-fighter at the Firefighter 2 level,
- recognize situations and take corrective actions when personal safety may be at risk,
- apply the basic skills to operate portable pumps, read and understand fire maps, compass and GPS.

For more information contact Tom Laugle, 503-594-3066 or toml@clackamas.edu or visit www.clackamas.edu/firescience/

WILDLAND FIREFIGHTER 1 CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
ESH-100	Environmental Regulations	3
FRP-130	Introduction to Wildland Firefighting (S-130/S-190)	3
FRP-131	Advanced Firefighter Training (S-131)	1
FRP-211	Portable Pumps & Water Use (S-211)	1
FRP-216	Driving for the Fire Service (S-216)	2
FRP-243	Survivor I: Map, Compass, GPS	2
<i>Credits required for certificate</i>		12



Wildland Fire Forestry

Career Pathway Certificate

The Wildland Fire Forestry program provides training in Forestry and Conservation skills needed for technicians in this field of work. Intended for students who would like to pursue a variety of careers in the outdoors. Students are introduced to the functions, basic tools and processes to manage forestland in Oregon.

PROGRAM OUTCOMES

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

- summarize use of Silviculture and regeneration practices,
- demonstrate how to identify trees and shrubs commonly found in Oregon,
- discuss the basics of forest road development,
- demonstrate the basics of forest measurement tools,
- explain the basics of marketing timber,
- identify logging systems,
- cite Oregon forest harvest laws.

For more information contact Tom Laugle, 503-594-3066 or toml@clackamas.edu or visit www.clackamas.edu/firescience/

WILDLAND FIRE FORESTRY CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
BI-103	General Biology; Plants & Ecosystems	4
BI-103L	General Biology; Plants & Ecosystems Lab	0
FRP-101	Basic Forest Management	3
FRP-102	Basic Forest Management Lab	1
FRP-201	Advanced Forest Management	3
FRP-205	Forest Management Assessments & Inventories	3
<i>Credits required for certificate</i>		14

Fitness Technology

Certificate

The Fitness Technology certificate will give students the core skills and experience needed to enter the fitness industry at an entry level position. Students attain knowledge and learn skills to seek careers related to personal training, nutrition, strength and conditioning specialist as well as other careers in the fitness industry.

The course work for this program includes cooperative work experience which affords the student opportunity for hands-on-experience within the various areas of the health and fitness industry. Students may enter this program at any term.

PROGRAM OUTCOMES

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

- demonstrate excellent interpersonal skills in the areas of leadership, motivation and communication;
- understand and apply advanced exercise principles related to injury prevention, conditioning, resistance training, and functional training;

- understand and apply nationally recognized standards for fitness and health and be able to communicate the benefits and precautions associated with exercise,
- understand and apply behavior modification strategies to enhance exercise and health behavior change with clients,
- demonstrate excellent leadership abilities, interpersonal communication skills, organizational and presentation skills and other necessary professional qualities demanded of health and fitness professionals in the workforce.

CAREERS

Career opportunities include personal trainer, life coach, nutrition specialist, strength and conditioning specialist, athletic coach, fitness instructor and Physical Education instructor.

For information contact Tracy Nelson, 503-594-3274 or tracyn@clackamas.edu

FITNESS TECHNOLOGY CERTIFICATE OF COMPLETION

FIRST TERM		CREDITS
HE-151	Body and Drugs I	3
MTH-050	Technical Mathematics I or MTH-065 Algebra II	3-4
PE-240	Strength & Conditioning Theory and Techniques	3
HE-202	Introduction to Fitness Technology Careers	1
— —	Fitness Technology program elective	2
SECOND TERM		
COMM-100*	Basic Speech	3
HE-252	First Aid/CPR/AED	3
HPE-295	Health and Fitness for Life	3
PE-280	Physical Education/CWE	3
— —	Fitness Technology program elective	3
THIRD TERM		
HE-223	Sports Nutrition	3
HE-250	Personal Health	3
HS-100	Introduction to Human Services	3
PE-280	Physical Education/CWE	3
WR-101	Communication Skills: Occupational Writing or WR-121 English Composition	3-4
— —	Fitness Technology program elective	3
<i>Credits required for certificate</i>		<i>45 credits</i>

FITNESS TECHNOLOGY PROGRAM ELECTIVES

COURSE	CREDITS
HE-152	Body and Drugs II
HE-249	Mental Health
HE-255	Body & Alcohol
PE-185	Physical Education Activity Course
PE-260	Care & Prevention of Athletic Injuries
PE-270	Sport & Exercise Psychology
PE-294A	Philosophy of Coaching
HE-201	Personal Training
HE-207	Introduction to Plant Based Living

*COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B, and COMM-100C

Geographic Information Systems (GIS) Technology

Certificate

The Geographic Information Systems (GIS) Technology Certificate offers instruction in the fields of geography, cartography, computer-aided drafting (CAD), global positioning systems (GPS), database theory and mathematics. The program also includes instruction in research skills, technical mathematics, computer programming, human relations skills and other field competencies.

PROGRAM OUTCOMES

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

- interpret accurately technical drawings to determine product manufacturing specifications,
- understand clearly GIS concepts and techniques,
- understand and capably use many aspects of the ArcGIS software,
- create high quality digital maps,
- design, plan and execute GIS projects;
- create and design advanced Geodatabases for use in GIS,
- use capably geoprocessing tools to analyze data in a GIS environment,
- write scripts using the Python programming language,
- use advanced editing techniques to capture GIS data,
- analyze and interpret remote sensing data, including LIDAR,
- use a mapping grade Global Positioning System (GPS) to collect data for a GIS project,
- transform data form different formats to a GIS,
- create websites using HTML,
- create CAD data and transform it to a GIS.

CAREERS

Career opportunities may include: GIS technician, mapping technician and survey technician.

For information contact the Manufacturing Department, 503-594-3318.

GEOGRAPHIC INFORMATION SYSTEMS (GIS) TECHNOLOGY CERTIFICATE

FIRST TERM		CREDITS
GEO-100	Introduction to Physical Geography or GEO-110 Cultural & Human Geography	4
GIS-201	Introduction to Geographic Information System	3
GIS-236	Visual Basic Programming for GIS	1
MFG-109	Computer Literacy for Technicians	3
MTH-050	Technical Mathematics I	3
WR-121	English Composition	4

*Geographic Information Systems (GIS) Technology continued...***SECOND TERM**

CDT-103	Computer-Aided Drafting I	3
GIS-237	Advanced Visual Basic Programming for GIS	1
GIS-281	ArcGIS I	3
GIS-286	Remote Sensing	3
MTH-080	Technical Mathematics II	3
— —	Technical elective	3

THIRD TERM

CDT-224	Professional Web Design	1
GIS-232	Data Collection & Application	3
GIS-280	GIS/CWE	4
GIS-282	ArcGIS II	3
— —	Human Relations requirement (see page 68)	3

Credits required for certificate 48

TECHNICAL ELECTIVES

Any course with a GIS or CDT prefix.

Gerontology

Certificate

The Gerontology program offers a one-year certificate on the study of aging, which is designed for individuals who work with older people. The one-year certificate can provide significant coursework towards the two-year Associate of Applied Science degree in Human Services.

PROGRAM REQUIREMENTS

Current CPR certificate is required.

PROGRAM OUTCOMES

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

- demonstrate the academic skills necessary to continue the study of gerontology at the next educational level,
- apply gerontological concepts to practice settings working with older adults,
- demonstrate an understanding of current community resources available to older adults and how to access them,
- communicate effectively with co-workers and clients of all ages,
- differentiate between normal aging and disease processes associated with aging, especially chronic illness and dementia;
- provide support to older adults grieving a loss (including the death of a loved one) by utilizing knowledge and skills of grief and bereavement.

CAREERS

Career opportunities include activity director, volunteer coordinator, senior services case worker, information and referral worker, client advocate, and administrative and support personnel in senior residential facilities.

For more information, contact Yvonne Smith at 503-594-3207 or yvonne@clackamas.edu

GERONTOLOGY CERTIFICATE**FALL TERM**

		CREDITS
GRN-181	Issues in Aging	3
HE-151	Body and Drugs I	
or HE-255	Body and Alcohol	3
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
— —	Gerontology program elective	3-4
— —	Human Relations requirement (see page 68)	
	(Recommended: PSY-101)	3-4

WINTER TERM

GRN-182	Aging & the Body	3
GRN-184	Aging & the Individual	3
HS-154	Community Resources	3
HS-156	Interviewing Theory and Techniques	3
— —	Gerontology program elective	3-4

SPRING TERM

GRN-183	Death & Dying	3
GRN-280	Gerontology/CWE	3
HS-170	Preparation for Field Experience in Human Services	3
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II	3-4
— —	Gerontology program elective	3-4

Credits required for certificate 45-51

GERONTOLOGY PROGRAM ELECTIVES

COURSE		CREDITS
COMM-140	Introduction to Intercultural Communication	4
CS-120	Survey of Computing	4
ED-258	Multicultural Education	3
FN-110	Personal Nutrition	3
HE-152	Body and Drugs II	3
HS-100	Introduction to Human Services	3
HS-103	Ethics for Human Services Workers	2
HS-130	Introduction to Hospice	3
HS-165	Activity Director for Long Term Care	3
HS-211	HIV, TB & Infectious Diseases	1
HS-216	Group Counseling Skills	3
HS-260	Victim Advocacy and Assistance	4
NUR-100	Nursing Assistant I	7
NUR-100C	Nursing Assistant I Lab	0
NUR-101	Certified Nursing Assistant 2	5
NUR-101C	Certified Nursing Assistant 2 Lab	0
PSY-219	Abnormal Psychology	4
PSY-221	Introduction to Counseling	4

Other electives may be approved by the Gerontology program advisor.

Gerontology for Health Care Professionals

Career Pathway Certificate

The need for nurses to be better prepared for caring for our aging population has been highlighted by the National League for Nurses (NLN) 2012, The Hartford Center for Geriatric Nursing (1996), the Institute of Medicine (IOM) 2012, Healthy People 20-20 and myriad other nursing organizations. Currently the Oregon Consortium for Nursing Education (OCNE) requires students receive Older Adult content in NRS-110 (Health Promotion) and then the assumption is that as the curricula addresses the life span of an individual, that more gerontology content is included throughout the program. Although this may be the case, it is up to each individual college and then each individual instructor to determine when and how much gerontology content to include. This career pathway certificate will address the need for students in nursing and other allied health care programs (such as Medical Assistant, and Emergency Management Technology) to have the background and knowledge to work with the aging population.

PROGRAM OUTCOMES

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

- apply current theories in gerontology to their field of practice,
- apply gerontological concepts to practice settings working with older adults,
- differentiate between normal aging and disease processes associated with aging, especially chronic illness and dementia;
- provide support to older adults grieving a loss (including the death of a loved one) by utilizing knowledge and skills of grief and bereavement,
- discuss the impact of aging on patient care in the allied health fields.

For information, contact Yvonne Smith at 503-594-3207 or yvonne@clackamas.edu

GERONTOLOGY FOR HEALTH CARE PROFESSIONALS CAREER PATHWAY CERTIFICATE

COURSE	CREDITS
GRN-181 Issues in Aging	3
GRN-182 Aging & the Body	3
GRN-183 Death & Dying	3
GRN-184 Aging & the Individual	3
— — Gerontology for Health Care Professionals program electives	3
<i>Credits required for certificate</i>	<i>15</i>

GERONTOLOGY FOR HEALTH CARE PROFESSIONALS PROGRAM ELECTIVES

COURSE		CREDITS
GRN-290	Special Topics in Gerontology	1
HE-151	Body & Drugs I	3
HE-255	Body & Alcohol	3
HS-154	Community Resources	3
HS-156	Interviewing Theory & Techniques	3
HS-165	Activity Director	3

Nursing Assistant–Gerontology Specialist

Career Pathway Certificate

This program combines the nursing assistant clinical training with the applicable theory aimed at serving our aging population. This certificate will ultimately lead to an advanced workforce for employers and more robust employment opportunities for students.

PROGRAM OUTCOMES

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

- apply gerontological concepts to practice settings working with older adults,
- differentiate between normal aging and disease processes associated with aging, especially chronic illness and dementia;
- provide support to older adults grieving a loss (including the death of a loved one) by utilizing knowledge and skills of grief and bereavement.

For information, contact Yvonne Smith at 503-594-3207 or yvonne@clackamas.edu

NURSING ASSISTANT–GERONTOLOGY SPECIALIST CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
GRN-181	Issues in Aging	3
GRN-182	Aging & the Body	3
GRN-183	Death & Dying	3
GRN-184	Aging & the Individual	3
NUR-100	Nursing Assistant I	7
NUR-100C	Nursing Assistant I Clinical	0

Credits required for certificate

19



Horticulture

Certificate

Associate of Applied Science Degree

The Horticulture Department provides quality education and training for industry and community members. Greenhouse, nursery, landscape and urban agriculture courses integrate technical knowledge, critical thinking and environmental stewardship appropriate for the 21st century.

Horticulture is a hands-on, broad-based curriculum where all students participate in a laboratory-style practicum class which develops a full season's experience in growing and caring for plants. Learning activities involve students in the day-to-day operation of a wide range of power and hand tools used in the trade, including: landscape mowers, rototillers, computers, tractors, skid steer loader, pruning tools and greenhouse equipment. Students cultivate plants in CCC's extensive landscape and greenhouse facilities, including: the Water-Efficient Demonstration Garden, All-American Selections Display Garden, Annual Display Garden, Herb Garden, Perennial Garden, Certified Landscape Technician Test site, Farm site and several greenhouses.

Students may begin this program any term. Degree options include a one-year certificate program or a two-year associate's degree program. Following the course offerings in the order listed is not required, but will allow for completion in the one or two year period.

PROGRAM OUTCOMES

Horticulture AAS Degree

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

- demonstrate a broad range of skills in the production and maintenance of plants, including: safe use of tools and equipment, propagation from seeds and cuttings, landscape maintenance activities, growing in a greenhouse environment, and vegetable bed preparation;
- identify common woody plants in the landscape,
- recognize and evaluate key pests and propose solutions based on IPM strategies,
- use a basic understanding of plant biology and soil science to make sound decisions in the production and maintenance of plants,
- display effective decision making, time management and project management skills in the horticulture industry;
- communicate effectively with co-workers and customers through speaking, writing and computer technology;
- pass the ODA Pesticide Laws & Safety exam, and an applicator exam.

PROGRAM OUTCOMES

Horticulture Certificate Degree

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

- demonstrate a broad range of skills in the production and maintenance of plants, including: safe use of tools and equipment, propagation from seeds and cuttings, landscape maintenance activities, growing in a greenhouse environment, and vegetable bed preparation;
- identify common woody plants in the landscape,
- implement IPM strategies in the horticulture industry,
- use a basic understanding of plant biology and soil science to make sound decisions in the production and maintenance of plants,
- effectively communicate with co-workers and customers through speaking, writing, and computer technology;
- pass the ODA Pesticide Laws & Safety exam.

Students are eligible to sit for the Oregon Certified Nursery Professional Exam. Students completing the Horticulture Associate of Applied Science (AAS) Degree with a 2.5 GPA or higher, are eligible to take the Oregon Landscape Contractors License exam.

CAREERS

Career opportunities include nursery and garden center manager and associate, nursery production, greenhouse grower, organic food production, supply and equipment sales, landscape design, installation and maintenance worker, parks department personnel and groundskeeper.

For information contact Renee Harber, Horticulture advisor, 503-594-3294 or rharber@clackamas.edu

OREGON STATE UNIVERSITY TRANSFER AGREEMENT

Some horticulture classes transfer to Oregon State University as part of a bachelor's degree. Horticulture students planning to continue their studies at a four-year college should consult the Horticulture advisor to obtain the most recent transfer information.

OSU TRANSFER COURSES

COURSE		CREDITS
HOR-215	Herbaceous Perennials	3
HOR-226	Plant Identification/Fall	3
HOR-227	Plant Identification/Winter	3
HOR-228	Plant Identification/Spring	3

HORTICULTURE CERTIFICATE

FALL TERM		CREDITS
CS-091	Computers for New Users II	2
HOR-111	Horticulture Practicum/Fall	2
HOR-115	Horticulture Safety	1
HOR-122	Greenhouse Crops-Potted Plants	
or HOR-224	Landscape Installation	3
HOR-223	Horticulture Science	3
HOR-226	Plant Identification/Fall	3
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II (or higher level math)	3-5

WINTER TERM

HOR-130	Plant Propagation Theory	
or HOR-131	Tree & Shrub Pruning	3
HOR-133	Horticulture Practicum/Winter	2
HOR-216	Integrated Pest Management	3
HOR-222	Horticultural Computer Applications	2
HOR-227	Plant Identification/Winter	3

SPRING TERM

BA-285	Human Relations in Business	
or COMM-100***	Basic Speech Communication	3-4
HOR-112	Horticulture Career Exploration	2
HOR-120	Pesticide Laws & Safety	1
HOR-140	Soils	3
HOR-142	Greenhouse Crops-Bedding Plants	
or HOR-145	Turf Installation & Maintenance	2-3
HOR-143	Horticulture Practicum/Spring	2
HOR-228	Plant Identification/Spring	3

SUMMER TERM

HOR-280	Horticulture/CWE	3
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
<i>Credits required for certificate</i>		52-57

**HORTICULTURE ASSOCIATE OF APPLIED SCIENCE DEGREE:
1ST YEAR**

FALL TERM		CREDITS
CS-091	Computers for New Users II	2
HOR-111	Horticulture Practicum/Fall	2
HOR-115	Horticulture Safety	1
HOR-122	Greenhouse Crops-Potted Plants	
or HOR-224	Landscape Installation	3
HOR-223	Horticulture Science	3
HOR-226	Plant Identification/Fall	3
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II (or higher level math)	3-5

WINTER TERM

HOR-130	Plant Propagation Theory	
or HOR-131	Tree & Shrub Pruning	3
HOR-133	Horticulture Practicum/Winter	2
HOR-216	Integrated Pest Management	3
HOR-222	Horticultural Computer Applications	2
HOR-227	Plant Identification/Winter	3

SPRING TERM

HOR-112	Horticulture Career Exploration	2
HOR-120	Pesticide Laws & Safety	1
HOR-140	Soils	3
HOR-142	Greenhouse Crops-Bedding Plants	
or HOR-145	Turf Installation & Maintenance	2-3
HOR-143	Horticulture Practicum/Spring	2
HOR-228	Plant Identification/Spring	3

SUMMER TERM

HOR-281	Horticulture/CWE	
or HOR-280	Horticulture/CWE and HOR-282 Horticulture/CWE	6

**HORTICULTURE ASSOCIATE OF APPLIED SCIENCE DEGREE:
2ND YEAR**

FALL TERM		CREDITS
HOR-235	Weed Identification	
or HOR-236	Insect Identification	2
SPN-101	First Year Spanish	4
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
— —	Horticulture program electives	6

WINTER TERM

BA-119	Project Management Practices	2
BA-250	Small Business Management	3
HOR-230	Equipment Operation & Maintenance	2
HOR-231	Irrigation & Drainage Design	3
HOR-237	Disease Identification	2
— —	Horticulture program electives	3

SPRING TERM

BA-285	Human Relations in Business	
or COMM-100***	Basic Speech Communication	3-4
HE-252**	First Aid/CPR	3
HOR-240	Irrigation & Drainage Practices	3
— —	Horticulture program electives	5

Credits required for degree 93-97**HORTICULTURE PROGRAM ELECTIVES**

COURSE		CREDITS
HOR-114	Garden Design	1
HOR-122	Greenhouse Crops—Potted Plants	3
or HOR-124	Food Harvest	3
HOR-123	Landscape Maintenance	3
HOR-125	Food Production in the Willamette Valley	3
HOR-126*	Landscape Water Features	1
HOR-127*	Landscape Lighting	1
HOR-128*	Landscape Stones & Pavers	1
HOR-129*	Landscape Decks & Fences	1
HOR-130	Plant Propagation Theory	3
or HOR-131	Tree & Shrub Pruning	3
HOR-134	Herb Growing & Gardening	1
HOR-135	Propagation of Edible Plants	3
HOR-142	Greenhouse Crops—Bedding Plants	3
or HOR-145	Turf Installation & Maintenance	2
HOR-144	Basic Pruning	1
HOR-146	Fruit & Berry Growing	3
HOR-148	Farm Equipment	3
HOR-211	Native Plant Identification	1
HOR-212	Flower Arranger's Garden	3
HOR-213	Computer-Aided Landscape Design	3
HOR-215	Herbaceous Perennial Plants	3
HOR-216	Integrated Pest Management	3
HOR-220	Plant Propagation/Fall	3
HOR-224	Landscape Installation	3
HOR-225*	Principles of Arboriculture	3
HOR-229*	Introduction to Landscape Design	3
HOR-231	Irrigation & Drainage Design	3
HOR-232*	Commercial Floral Design	3
HOR-234	Intermediate Landscape Design	3
HOR-235	Weed Identification	
or HOR-236	Insect Identification	2
HOR-239	Tree Climber Training	2
HOR-240	Irrigation & Drainage Practices	3
HOR-241*	Nursery Management	3
HOR-242	Plant Propagation/Spring	3
HOR-244*	Environmental Landscape Design	3
HOR-246	Organic Farming & Gardening	3
HOR-248	Flower Arranger's Garden/Spring	3
HOR-250	Western Herbs	2
HOR-251	Herbal Products	1
HOR-252	Kitchen Herbs	1
HOR-281	Horticulture/CWE	6
or HOR-280	Horticulture/CWE	3
HOR-282	Horticulture/CWE	3

*Offered alternate years

**Course may be waived with current CPR certification

***COMM-100 may be substituted by taking all of the following:
COMM-100A, COMM-100B and COMM-100C

Irrigation Technician

Career Pathway Certificate

The Irrigation Technician program provides instruction for design, installation, repair, upgrade, maintenance, monitoring and programming of irrigation systems for landscapes, nurseries, golf courses, parks or agriculture. This pathway certificate is a part of the Horticulture certificate and AAS degree programs.

PROGRAM OUTCOMES

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

- design, install, maintain, troubleshoot, repair and program irrigation systems.

CAREERS

Career opportunities include working as an Irrigation Technician in nurseries, greenhouses, parks, golf courses, landscapes or production agriculture.

For information contact Renee Harber, Horticulture advisor, 503-594-3294 or rharber@clackamas.edu

IRRIGATION TECHNICIAN CAREER PATHWAY CERTIFICATE

WINTER TERM

HOR-231	Irrigation & Drainage Design	3
HOR-281	Horticulture/CWE	
or HOR-280	Horticulture/CWE and HOR-282 Horticulture/CWE	6

SPRING TERM

HOR-140	Soils	3
HOR-240	Irrigation & Drainage Practices	3

Credits required for certificate 15

Plant Health Management

Career Pathway Certificate

The Plant Health Management program provides instruction for monitoring and identifying pests, selecting and utilizing appropriate control measures and evaluating their effectiveness. Course work is offered through evening classes and on-the-job training. This pathway certificate is a part of the Horticulture Certificate and AAS programs.

PROGRAM OUTCOMES

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

- pass the ODA Pesticide Laws & Safety exam, and a Commercial Pesticide Applicator exam;
- recognize and evaluate key pests in the landscape and propose solutions based on IPM strategies.

CAREERS

Career opportunities include working as a Plant Health Management Technician or Pest Control Specialist in nurseries, greenhouses, parks, golf courses, landscape management, or production agriculture.

For information contact Renee Harber, Horticulture advisor, 503-594-3294 or rharber@clackamas.edu

PLANT HEALTH MANAGEMENT CAREER PATHWAY CERTIFICATE

FALL TERM		CREDITS
HOR-235	Weed Identification	2
HOR-236	Insect Identification	2
WINTER TERM		
HOR-216	Integrated Pest Management	3
HOR-237	Disease Identification	2
SPRING TERM		
HOR-120	Pesticides Laws & Safety	1
HOR-281	Horticulture/CWE	
or HOR-280	Horticulture/CWE and HOR-282 Horticulture/CWE	6
Credits required for certificate		16

Human Services Generalist

Certificate

Associate of Applied Science Degree

Both the one-year certificate and the two-year AAS in Human Services Generalist degree offer training for both entry-level positions in diverse social services agencies. The degree combines academic course work with 12 credits of supervised field experience. In addition to general course work in human services, students may select a variety of approved elective certificates/courses to focus on different concentration areas.

PROGRAM OUTCOMES

Human Services Generalist AAS Degree

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

- demonstrate appropriate interviewing skills when working with human service clients,
- complete human service assessments that include client strengths and challenges,
- outline key resources in the community and the network of service delivery,
- apply knowledge about the development and function of individuals and families in a practice setting,
- practice professional communication skills both verbally and in writing in a human services setting,
- adhere to the professional ethics, attitudes and values necessary for effective human service work.

PROGRAM OUTCOMES

Human Services Generalist Certificate Degree

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

- outline key resources in the community and the network of service delivery,
- apply knowledge about the development and function of individuals and families in a practice setting,
- practice beginning-level professional communication skills both verbally and in writing in a human services setting,
- adhere to the professional ethics, attitudes and values necessary for effective human service work.

CAREERS

Opportunities for employment include positions such as case managers and assistants, resource specialists, family advocates, client advocates, intake workers, family assistance workers and volunteer coordinators.

For information contact Yvonne Smith, 503-594-3207 or yvonne@clackamas.edu

HUMAN SERVICES GENERALIST CERTIFICATE

FALL TERM		CREDITS
HDF-260	Understanding Child Abuse & Neglect	3
HE-151	Body & Drugs I	3
HS-100	Introduction to Human Services	3
WR-101	Occupational Writing	
or WR-121	English Composition	3-4
— —	Human Services Generalist program electives	3

WINTER TERM

HE-152	Body & Drugs II	
or HE-255	Body & Alcohol	3
HS-154	Community Resources	3
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II	3-4
— —	Human Services Generalist program electives	6

SPRING TERM

HDF-140	Contemporary American Families	3
HS-170	Introduction to Field Experiences in Human Services	3
HS-280	Human Services Generalist: CWE/Practicum	3
SOC-205	Social Stratification & Social Systems	4
— —	Human Services Generalist program electives	3

Credits required for certificate 46-48

HUMAN SERVICES GENERALIST**ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

FALL TERM		CREDITS
HDF-260	Understanding Child Abuse & Neglect	3
HE-151	Body & Drugs I	3
HS-100	Introduction to Human Services	3
WR-101	Occupational Writing	
or WR-121	English Composition	3-4
— —	Human Services Generalist program electives	3

WINTER TERM

HE-152	Body & Drugs II	
or HE-255	Body & Alcohol	3
HS-154	Community Resources	3
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II	3-4
— —	Human Services Generalist program electives	6

SPRING TERM

HDF-140	Contemporary American Families	3
HS-170	Introduction to Field Experiences in Human Services	3
SOC-205	Social Stratification & Social Systems	4
— —	Human Services Generalist program electives	6

HUMAN SERVICES GENERALIST**ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
HS-260	Victim Advocacy & Assistance	4
HS-280	Human Services Generalist: CWE/Practicum	4
PSY-215	Introduction to Developmental Psychology	4
— —	Human Services Generalist program electives	3

WINTER TERM

HS-156	Interviewing Theory & Techniques	3
HS-281	Human Services Generalist II: CWE/Practicum	4
PSY-221	Introduction to Counseling	4
— —	Human Services Generalist program electives	4

SPRING TERM

HS-216	Group Counseling Skills	3
HS-282	Human Services Generalist III: CWE/Practicum	4
PSY-219	Introduction to Abnormal Psychology	4
— —	Human Services Generalist program electives	3

Credits required for degree 90-92

HUMAN SERVICES GENERALIST PROGRAM ELECTIVES

Students take 25 credits from any of the following certificate programs, as electives in the Human Services Generalist program:

- Alcohol & Drug Counselor Career Pathway Certificate
- Business Management Certificate
- Early Childhood Education & Family Studies Certificate
- Emergency Medical Technology (EMT) Certificate
- Family Development Career Pathway Certificate
- Gerontology Certificate
- Juvenile Corrections Certificate
- Medical Assistant Certificate
- Paraeducator Certificate

Alcohol & Drug Counselor

Career Pathway Certificate

The Alcohol & Drug Counselor Pathway Certificate prepares students to sit for the certification examination offered by the Addiction Counselor Certification Board. The coursework is appropriate both for new students to the field, and those wishing to update their skills or seek additional certification. The certificate provides the 150 educational hours required by the certification board. Students can also opt to add a CWE component that will partially fulfill the 1000 required practicum hours. Qualifying for the CADC I certificate is a stepping stone for students who want to work now, but may also be thinking of pursuing further education in the future. More information about certification can be found at www.acbo.com

PROGRAM OUTCOMES

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

- demonstrate appropriate interviewing skills in an assessment or treatment setting,
- articulate the ethics required for effective work in the substance abuse field,
- recognize the signs of common substance abuse disorders,
- discuss the impact of drug use and abuse on society and the public health.

Continued

Alcohol & Drug Counselor continued...

CAREERS

This program prepares students to work in a variety of human service settings, including both inpatient and outpatient treatment programs, programs for the homeless, and a variety of community agencies.

For information contact Yvonne Smith, 503-594-3207 or yvonnnes@clackamas.edu

ALCOHOL & DRUG COUNSELOR CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
HE-151	Body and Drugs I	3
HE-255	Body and Alcohol	3
HS-103	Ethics for Human Service Workers	2
HS-156	Interviewing Theory and Techniques	3
HS-211	HIV, TB, and Infectious Diseases	1
HS-216	Group Counseling Skills	3
<i>Credits required for certificate</i>		<i>15</i>

Note: Students may add HS-280 Human Services Generalist I/CWE for additional credits

Career Development Facilitator

Career Pathway Certificate

The Career Development Facilitator Career Pathway Certificate is designed for individuals who are working in the field of career development and/or career advancement. This certificate can also serve as a step toward earning a Global Career Development Facilitator Credential which is endorsed by the National Career Development Association.

PROGRAM OUTCOMES

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

- be proficient in the basic career facilitating process while including productive interpersonal relationships,
- use current resources to understand labor market and occupational information and trends,
- comprehend and with supervision, use both formal and informal career development assessments with emphasis on relating appropriate ones to the population served,
- recognize special needs of various groups and adapt services to meet their needs,
- follow the CDF code of ethics and know current legislative regulations,
- understand career development theories, models, and techniques as they apply to lifelong development, gender, age, and ethnic background;
- know job search strategies and placement techniques, especially in working with specific groups,
- prepare and develop materials for training programs and their implementation, and work as a liaison in collaborative relationships;
- market and promote career development programs with staff and supervisors,
- comprehend and use career development,

- computer applications,
- accept suggestions for performance improvement from consultants or supervisors.

CAREERS

Career development facilitator training can enhance the skills of many careers including human service providers, educators, training and development specialists, and human resource professionals. Career development facilitators may serve as school-to-work coordinators, work force development personnel, case managers, job search and career workshop facilitators, career coaches, intake interviewers, career resource specialists, and employment/placement specialists.

For information contact Student Life & Leadership, 503-594-3475, or www.clackamas.edu/Advising/

CAREER DEVELOPMENT FACILITATOR CAREER PATHWAY CERTIFICATE

FIRST TERM		CREDITS
HS-217	Helping Skills and Diverse Populations	2
HS-218	Career Development Models and Assessments	2
SECOND TERM		
HS-219	Training Clients/Peers and Employability Skills	2
HS-220	Labor Market Information and Technology in Career Planning	2
THIRD TERM		
HS-221	Ethics and Consultation	2
HS-222	Program Management and Public Relations	2
— —	Career Development Facilitator program electives or general elective (any 100 level or above)	3-4
<i>Credits required for certificate</i>		<i>15-16</i>

CAREER DEVELOPMENT FACILITATOR PROGRAM ELECTIVES

COURSE		CREDITS
HS-154	Community Resources	3
HS-260	Victim Advocacy & Assistance	4
HS-280	Human Services Generalist I/CWE	4



Landscape Management

Associate of Applied Science Degree

The Landscape Management degree will prepare students for entry-level management positions in the landscaping industry by providing them business, communication and project management skills in addition to a basic understanding of, and hands-on experience with, the activities involved in the installation and maintenance of landscapes.

Sustainable practices, such as the use of Integrated Pest Management, low water landscapes, and techniques that protect and care for the soil are emphasized throughout the program. Students use Industry standard equipment and practices in the care of CCC's extensive landscape facilities, including an arboretum, water-efficient demonstration garden, large turf areas, several herbaceous perennial and shrub beds, and our award winning All-American Selections Display Garden.

CCC's landscape program is the only one in Oregon accredited by the Professional Landcare Network (PLANET), which speaks to its credibility in the industry. Students have the opportunity to compete on the team that attends the National PLANET Student Career Days each year. Also, PLANET's certified technician testing site for Oregon is located on campus, and is used for instructional purposes.

Students may begin this program any term. Following the course offerings in the order listed is not required, but will allow for completion in a two year period.

PROGRAM OUTCOMES

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

- demonstrate competency in sustainable landscape maintenance and installation activities, including: safe use of tools and equipment, operation of irrigation systems, pruning and training techniques, turf maintenance, hardscape installation and reading/installing from a design plan;
- identify common woody and herbaceous plants in the landscape,
- recognize and evaluate key pests in the landscape and propose solutions based on IPM strategies;
- use a basic understanding of plant biology and soil science to make sound decisions in the design and maintenance of landscapes,
- display effective decision making, time management and project management skills in the landscape industry environment;
- effectively communicate with co-workers and customers through speaking, writing and computer technology,
- pass the ODA Pesticide Laws & Safety exam, and a Commercial Pesticide Applicator exam;
- pass PLANET's Landscape Industry Certified Technician Test for Ornamental Maintenance.

Students completing the Landscape Maintenance Associate of Applied Science (AAS) Degree with a 2.5 GPA or higher are eligible to take the Oregon Landscape Contractors License exam.

CAREERS

As a graduate of our Landscape program, you will be prepared to work in a supervisory or skilled landscape technician position for a landscape design/build company, estate garden parks department, tree care company, golf course or as a self-employed installation/maintenance contractor.

For information contact Renee Harber, Horticulture advisor, 503-594-3294 or rharber@clackamas.edu

OREGON STATE UNIVERSITY TRANSFER AGREEMENT

Some horticulture classes transfer to Oregon State University as part of a bachelor's degree. Landscape students planning to continue their studies at a four-year college should consult the Horticulture advisor to obtain the most recent transfer information.

LANDSCAPE MANAGEMENT

ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
HOR-111	Horticulture Practicum/Fall	2
HOR-115	Horticulture Safety	1
HOR-123	Landscape Maintenance	3
HOR-223	Horticulture Science	3
HOR-226	Plant Identification/Fall	3
MTH-050	Technical Mathematics I	
or MTH-065 Algebra II (or higher level of math)		3-5
WINTER TERM		
HOR-131	Tree & Shrub Pruning	3
HOR-133	Horticulture Practicum/Winter	2
HOR-216	Integrated Pest Management	3
HOR-222	Horticultural Computer Applications	2
HOR-227	Plant Identification/Winter	3
HOR-229*	Introduction to Landscape Design	
or HOR-244*	Environmental Landscape Design	3
SPRING TERM		
BA-285	Human Relations in Business	
or COMM-100*** Basic Speech Communication		3-4
HOR-112	Horticulture Career Exploration	2
HOR-120	Pesticide Laws & Safety	1
HOR-140	Soils	3
HOR-143	Horticulture Practicum/Spring	2
HOR-228	Plant Identification/Spring	3
SUMMER TERM		
HOR-281	Horticulture/CWE	
or HOR-280 Horticulture/CWE and HOR-282 Horticulture/CWE		6

LANDSCAPE MANAGEMENT

ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM		CREDITS
HOR-224	Landscape Installation	3
HOR-235	Weed Identification	2
HOR-236	Insect Identification	2
SPN-101	First Year Spanish	4
— —	Landscape program electives	3

Continued

*Landscape Management continued...***Landscape Practices****WINTER TERM**

BA-119	Project Management Practices	2
BA-250	Small Business Management	3
HOR-230	Equipment Operation & Maintenance	2
HOR-231	Irrigation & Drainage Design	3
HOR-237	Disease Identification	2
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	
or BA-214	Business Communications	3-4

SPRING TERM

HE-252**	First Aid/CPR	3
Choose two from the following:		
HOR-126*	Landscape Water Features	
HOR-127*	Landscape Lighting	
HOR-128*	Landscape Stones & Pavers	
HOR-129*	Landscape Decks & Fences	2
HOR-145	Turf Installation & Maintenance	2
HOR-215	Herbaceous Perennials	
or HOR-244	Environmental Landscape Design	3
HOR-240	Irrigation & Drainage Practices	3

Credits required for degree 93-97

LANDSCAPE MANAGEMENT PROGRAM ELECTIVES

COURSE		CREDITS
HOR-125	Food Production in the Willamette Valley	3
HOR-126*	Landscape Water Features	1
or HOR-127*	Landscape Lighting	1
or HOR-128*	Landscape Stones & Pavers	1
or HOR-129*	Landscape Decks & Fences	1
HOR-134	Herb Growing & Gardening	1
HOR-142	Greenhouse Crops-Bedding Plants	3
HOR-146	Fruit & Berry Growing	3
HOR-211	Native Plant Identification	1
HOR-212	Flower Arranger's Garden	3
HOR-213*	Computer-Aided Landscape Design	3
HOR-225*	Principles of Arboriculture	3
HOR-229*	Introduction to Landscape Design	3
or HOR-244*	Environmental Landscape Design	3
HOR-242	Plant Propagation/Spring	3
HOR-246	Organic Farming & Gardening	3
HOR-248	Flower Arranger's Garden/Spring	3

*Offered alternate years

**Course may be waived with current CPR certification

***COMM-100 may be substituted by taking all of the following:
COMM-100A, COMM-100B and COMM-100C

Certificate

The Landscape Practices certificate will prepare students to work in the landscaping industry by providing them with hands-on experience, and a basic understanding of the activities involved in the installation and maintenance of landscapes.

Sustainable practices, such as the use of Integrated Pest Management, low water landscapes, and techniques, and techniques that protect and care for the soil are emphasized throughout the program. Students use industry standard equipment and practices in the care of CCC's extensive landscape facilities, including an arboretum, water-efficient demonstration garden, large turf areas, several herbaceous perennial and shrub beds, and our award winning All-American Selections Display Garden.

CCC's landscape program is the only one in Oregon accredited by the Professional Landcare Network (PLANET), which speaks to its credibility in the industry. Students have the opportunity to compete on the team that attends the National PLANET Student Career Days each year. Also, PLANET's certified technician testing site for Oregon is located on campus, and is used for instructional purposes.

Students may begin this program any term. Following the course offerings in the order listed is not required, but will allow for completion in a one year period.

PROGRAM OUTCOMES

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

- demonstrate competency in sustainable landscape maintenance and installation activities, including: safe use of tools and equipment, operation of irrigation systems, pruning and training techniques, turf maintenance, hardscape installation and reading/installing from a design plan;
- identify common woody and herbaceous plants in the landscape,
- recognize key pests in the landscape and follow IPM strategies,
- use a basic understanding of soil science to make sound decisions in the maintenance of landscapes,
- pass the ODA Pesticide Laws & Safety exam.

CAREERS

As a graduate of our Landscape Practices program, you will be prepared to work in a skilled landscape technician position for a: landscape design/build company, estate garden parks department, tree care company, golf course or as a self-employed installation/maintenance contractor.

For information contact Renee Harber, Horticulture advisor, 503-594-3294 or rharber@clackamas.edu

OREGON STATE UNIVERSITY TRANSFER AGREEMENT

Some horticulture classes transfer to Oregon State University as part of a bachelor's degree. Landscape students planning to continue their studies at a four-year college should consult the Horticulture advisor to obtain the most recent transfer information.



LANDSCAPE PRACTICES CERTIFICATE

FALL TERM		CREDITS
HOR-115	Horticulture Safety	1
HOR-123	Landscape Maintenance	3
HOR-224	Landscape Installation	3
HOR-226	Plant Identification/Fall	3
HOR-235	Weed Identification	2
HOR-236	Insect Identification	2
WINTER TERM		
HOR-131	Tree & Shrub Pruning	3
HOR-216	Integrated Pest Management	3
HOR-229*	Introduction to Landscape Design	
or HOR-244*	Environmental Landscape Design	3
HOR-230	Equipment Operation & Maintenance	2
HOR-237	Disease Identification	2-3
SPRING TERM		
HOR-120	Pesticide Laws & Safety	1
Choose one from the following:		
HOR-126*	Landscape Water Features	
HOR-127*	Landscape Lighting	
HOR-128*	Landscape Stones & Pavers	
HOR-129*	Landscape Decks & Fences	1
HOR-140	Soils	3
HOR-145	Turf Installation & Maintenance	2
HOR-228	Plant Identification/Spring	3
HOR-240	Irrigation & Drainage Practices	3
SUMMER TERM		
HOR-280	Horticulture/CWE	3
<i>Credits required for certificate</i>		43

* Offered alternate years

Manufacturing Technology

Professional Upgrade Certificate

Associate of Applied Science Degree

Course work in manufacturing technology prepares students for careers in high-tech manufacturing by producing products to exacting industrial standards utilizing current manual and computer-aided machine tool technology. Many classes are taught in a flexible, open-lab format and students may enter the program any term.

Individualized daytime and evening instruction is provided in the operation of machine tools such as: lathes, mills, surface and cylindrical grinders and common machine shop equipment. Included in the degree program is the study of computer numerical control (CNC) programming and machining for milling, turning and electrical discharge machining (EDM), as well as courses in computer-aided manufacturing (CAM) utilizing current industrial CAD/CAM software. Quality control is stressed while students are taught a wide range of measuring and inspection techniques. Other topics include courses offered in welding, materials science and basic electricity. Many students enroll in these courses to upgrade existing job skills and several of our courses satisfy the continuing education unit (CEU) requirements of local apprenticeships and trade organizations.

PROGRAM OUTCOMES*Manufacturing Technology AAS Degree*

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

- accurately interpret technical drawings to determine product manufacturing specifications,
- work safely in an industrial environment around machinery, power tools and chemicals;
- operate manual machine tools to produce products to required specifications,
- operate CNC machine tools including: program try-out, tooling/work-piece setup and adjustment, communicate effectively with G&M code language to perform everyday machining operations on three-axis milling machines and two-axis lathes,
- utilize computer software to create CAD models and CAM generated programs for machining processes,
- apply technical mathematics to solve manufacturing problems including: manual machining positioning, dimensional inspection, and CNC programming,
- apply knowledge of materials, physics and mathematics to effectively machine industrial materials;
- plan manufacturing operations in a logical and efficient manner to produce products on both manual and CNC machine tools,
- work and communicate effectively in team environment to achieve high quality value stream,
- work independently to solve common problems in manufacturing processes.

PROGRAM OUTCOMES*Manufacturing Technology Certificate Degree*

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

- accurately interpret technical drawings to determine product manufacturing specifications,
- work safely in an industrial environment around machinery, power tools and chemicals;
- apply technical mathematics to solve manufacturing problems including: manual machining positioning and dimensional inspection,
- plan manufacturing operations in a logical and efficient manner to produce products on manual machine tools,
- work independently to solve common problems in manufacturing processes.

CAREERS

Career opportunities may include machine tool operator, CNC programmer/operator and CAD/CAM technicians.

Continued

*Manufacturing Technology continued...***SHORT TERM TRAINING**

For students who need a quick-entry strategy into the work force, an individualized education and employment plan can be created that concentrates the knowledge and skills necessary to start or change a career path. Please see a faculty advisor for more information. A short-term training certificate is available.

For information contact the Manufacturing Department, 503-594-3318.

MANUFACTURING ENGINEERING TECHNOLOGY

(Oregon Tech transfer courses)

The Manufacturing Technology Department, in partnership with Oregon Tech, offers a significant number of transferable classes into Oregon Tech's Manufacturing Engineering Technology degree program. For information contact the Manufacturing Department, 503-594-3318.

CAD/CAM TECHNOLOGY DEGREE

See CAD/CAM Technology AAS degree program on page 82.

MANUFACTURING TECHNOLOGY CERTIFICATE

FIRST TERM		CREDITS
MFG-104	Print Reading	2
MFG-107	Industrial Safety & First Aid	3
MFG-111	Machine Tool Fundamentals I	9
MTH-050*	Technical Mathematics I	3
SECOND TERM		
MFG-105	Dimensional Inspection	2
MFG-109	Computer Literacy for Technicians	
or MFG-209	Programming and Automation for Manufacturing	3
MFG-112	Machine Tool Fundamentals II	9
MTH-080	Technical Mathematics II	3
THIRD TERM		
MFG-106	Applied Geometric Dimensioning & Tolerancing for Manufacturing	3
MFG-113**	Machine Tool Fundamentals III	6
MFG-280	Manufacturing Technology/CWE	2
WR-101*	Communication Skills: Occupational Writing	3
— —	Human Relations requirement (see page 68)	3
<i>Credits required for certificate</i>		51

**MANUFACTURING TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

Complete certificate program.

**MANUFACTURING TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FOURTH TERM		CREDITS
MFG-201	CNC I: Setup & Operation	4
MFG-204	Computer-Aided Manufacturing I	4
MFG-211	Machine Tool Fundamentals IV	6
— —	Manufacturing Technology program electives	3
FIFTH TERM		
MFG-202	CNC II: Programming & Operation	4
MFG-205	Computer-Aided Manufacturing II	4
— —	Manufacturing Technology program electives	6

SIXTH TERM

MFG-203	CNC III: Applied Programming & Operation	3
MFG-206	Computer-Aided Manufacturing III	3
MFG-221	Materials Science	3
MFG-280	Manufacturing Technology/CWE	2
— *	General elective (any course 100 level or above)	3

Credits required for degree **96**

MANUFACTURING TECHNOLOGY PROGRAM ELECTIVES

Complete three or more credits from the following:

COURSE		CREDITS
CDT-102	Sketching & Problem Solving	1-3
CDT-103	Computer-Aided Drafting I	4
CDT-108A	Introduction to Solid Modeling	3
CDT-223	Inventor Fundamentals	3
CDT-225	Advanced SolidWorks	1-3
MET-170	Introduction to Manufacturing Process	3
MFG-101	Essential Skills for Manufacturing I	2-4
MFG-113	Machine Tool Fundamentals III	3
MFG-130	Basic Electricity I	3
WLD-150	Welding Processes	4
— —	Other technical courses with departmental approval	

*Substitute college transfer courses for these courses if you plan to continue your education at a higher education institution. It is recommended that you consult with a faculty advisor or a staff member in Student Services for the transfer requirements of the specific advanced program or school.

**Students seeking to earn the associate's degree must take nine credits of MFG-113.

CNC Machining Technician

Career Pathway Certificate

The CNC Machining Technician program at Clackamas provides the training necessary for employment within the advanced manufacturing field. The program is arranged with core CNC competencies in mind while allowing the student flexibility to take other relevant manufacturing courses. Course work covers blueprint reading, technical mathematics, safety, and manual and CNC machining. The program is fully transferable to the one-year Manufacturing Technology Certificate or two-year Manufacturing Technology AAS Degree.

This certificate is part of the manufacturing career pathway preparing students for a wide variety of manufacturing careers and opportunities to continue at a four-year institution.

PROGRAM OUTCOMES

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

- accurately interpret technical drawings to determine key inspection dimensions and specifications,
- work safely in an industrial environment around machinery, power tools and chemicals;
- operate manual machine tools to produce simple products to required specifications,
- operate CNC machine tools including: program try-out, tooling/work-piece setup and adjustment of three-axis lathes;

- apply mathematics to solve manufacturing problems in machining and inspection.

CAREERS

Career opportunities may include entry-level CNC operator, machinist or general manufacturing technician.

For more information contact the Manufacturing Department, 503-594-3318.

CNC MACHINING TECHNICIAN CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
MFG-104	Print Reading	2
MFG-107	Industrial Safety & First Aid	3
MFG-111	Machine Tool Fundamental I	9
MFG-201	CNC I: Set-up & Operation	4
MTH-050	Technical Mathematics I	3
— —	CNC Machining Technician program elective	2-4
<i>Credits required for certificate</i>		23-25

CNC MACHINING TECHNICIAN PROGRAM ELECTIVES

COURSE		CREDITS
MFG-101	Essential Skills for Manufacturing I	2-4
MFG-105	Dimensional Inspection	2
MFG-106	Applied Geometric Dimensioning & Tolerancing for Manufacturing	2
MFG-112	Machine Tool Fundamental II	3
MFG-202	CNC II: Programming & Operation	4
MFG-204	Computer-Aided Manufacturing I	4
WLD-150	Welding Processes	4

Mastercam

Certificate

The Mastercam program is comprised of a series of three classes that prepare students to use Mastercam for 2D and 3D model building, toolpath selection and creation, and toolpath verification. Students will learn all basic 2D milling toolpaths, 3D surfacing toolpaths, and lathe with live-tooling toolpaths.

PROGRAM OUTCOMES

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

- utilize Mastercam for programming two dimensional toolpaths, advanced surface toolpaths, and lathe/mill-turn toolpaths.
- attain the skills necessary for employment as CAD/CAM CNC programmer.

CAREERS

CNC programmer

For information contact the Manufacturing Department, 503-594-3318.

MASTERCAM CERTIFICATE

COURSE		CREDITS
MFG-271	Mastercam Mill I	4
MFG-272	Mastercam Mill II	4
MFG-273	Mastercam Mill III	4
<i>Credits required for certificate</i>		12

Medical Assistant

Certificate

Medical assistants function as integral members of the health-care delivery team in performing administrative, clinical and trans-disciplinary (general) functions. The Medical Assistant (MA) program at Clackamas Community College is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) upon the recommendation of the Medical Assistant Educational Review Board, MAERB (CAAHEP), 1361 Park Street, Clearwater, FL 33756; telephone: 727-210-2350, online: www.caahep.org

PROGRAM PREREQUISITES & REQUIREMENTS

The MA applications with admission procedures, requirements, prerequisites and pertinent dates are available online, www.clackamas.edu/healthSciences/; at the Health Sciences Department and Student Advising Services at Harmony Campus, and at the Enrollment Service Center or Student Academic Support Services Department at the Oregon City Campus.

For successful completion of the MA program, applicants are advised that a high level of physical and mental stamina, manual dexterity, the ability to multitask, and a high degree of attention to detail will be required.

Prior to application the MA student candidate must:

- Meet the appropriate placement score in math either by taking the placement exam or by providing proof of a comparable assessment. CCC placements should be dated no earlier than 2007 or previous college coursework as documented by official college/university transcripts. To be eligible to apply, students must show placement by:
 - passing WR-095 or placement in WR-121
 - passing MTH-020 or placement in MTH-050/060
 - passing RD-090 or placement in RD-115
- During the multi-phase application process the applicant will be asked to provide:
 - proof of recent physical examination by a licensed healthcare provider,
 - proof of required immunizations or proof of immunity,
 - Healthcare Provider CPR (American Heart Association) card and a Basic First Aid card; both of which must remain current throughout the entirety of the MA program,
 - complete a criminal history background check and urine drug screen (UDS) as instructed by the Health Sciences Department. NOTE: Successful students will be asked to repeat the criminal history and UDS prior to entering clinical placement.
- candidates accepted into the MA program must have successfully completed MA-110, Medical Terminology, prior to beginning core curriculum. Please check the website as prerequisites may change from year to year.

Continued

Medical Assistant continued...

PROGRAM OUTCOMES

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

- demonstrate entry-level employment skills,
- apply knowledge appropriate to pass national exam,
- demonstrate the ability to work within the scope of practice of a medical assistant,
- perform phlebotomy and other specimen collection skills using accepted technical practices,
- apply medical laws and ethical principles to medical assisting practice,
- apply infection control principles and techniques to the practice of medical assisting,
- consistently demonstrate patient safety skills,
- calculate and safely administer medications: oral and parenteral,
- apply critical thinking skills to administrative and clinical competencies,
- apply professional behaviors in all aspects of medical assisting,
- sit for the American Association of Medical Assistants national certification exam, certification@aama.ntl.org or the American Medical Technologists national certification exam, www.americanmedtech.org

CAREERS

Career opportunities may include but are not limited to: employment in the ambulatory healthcare facilities, and outpatient surgical centers. Students should be prepared for entry-level employment as a medical assistant.

The Medical Assistant Program of Clackamas Community College does not discriminate among applicants as to age, gender affiliation, sexual orientation, color, religion, or national origin.

For continuing education opportunities for healthcare providers see Healthcare Professional Development (HPD) in the course description section on page 198.

MEDICAL ASSISTANT CERTIFICATE PREREQUISITE TO ACCEPTANCE

COURSE	CREDITS
MA-110 Medical Terminology	3

MEDICAL ASSISTANT CERTIFICATE

FALL TERM	CREDITS
BI-120 Introduction to Human Anatomy & Physiology	
or BI-101 General Biology; Cellular Biology	
& BI-102 General Biology; Animal Systems	
or BI-231 Human Anatomy & Physiology I	
& BI-232 Human Anatomy & Physiology II	
& BI-233 Human Anatomy & Physiology III	4
MA-112 Medical Office Practices	4
MA-145 Insurance & Health Information Management	3
WR-101 Communication Skills: Occupational Writing	
or WR-121 English Composition	3-4

SECOND TERM

MA-116	Introduction to Medications	3
MA-117	Clinical Lab Procedures I	2
MA-118	Examination Room Techniques	4
MTH-054	Medication Calculations for Medical Assistants	4
PSY-101	Human Relations	3

THIRD TERM (WEEKS 1-5)

MA-115	Phlebotomy for Medical Assistants	2
MA-121	Clinical Lab Procedures II	2
PSY-215	Introduction to Developmental Psychology	4

(WEEKS 6-11)

MA-119**	Medical Assistant Practicum	9
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Credits required for certificate 50-51

**To meet graduation requirements in addition to successful completion of courses, the MA student is required to:

- Participate in an unpaid, supervised externship in an ambulatory care setting.
- Perform 20 hours of public health-related community service.
- Register for either the CMA (AAMA) or the RMA (AMT) certification exam.

Note: All clinical/practicum courses are Pass/No Pass. All other courses are letter graded and must be passed with C or better.

Core curriculum is sequential and may not be taken out of order. Core curriculum is intended to be completed over three consecutive terms in one academic year.

Individuals who have been found guilty of, or pleaded guilty to a felony, may not be eligible for clinical practicum placement or be eligible to take the national certification exam.

For the Certified Medical Assistant (CMA) exam, direct inquiries to: AAMA Certification Department at www.aama-ntl.org or by phone 800-228-2262.

For the Registered Medical Assistant (RMA) exam, direct inquiries to www.americanmedtech.org or by phone 800-275-1268.



Microelectronics Systems Technology

Certificate

Associate of Applied Science Degree

This program prepares students for entry into the microelectronics and semiconductor industries. Course work focuses on wafer manufacturing, integrated circuit fabrication, component manufacturing, microelectronic assembly and equipment maintenance. Specific skill areas include: silicon materials fabrication, silicon manufacturing, semiconductor processing, microcontamination and particle control, troubleshooting of equipment and systems, microlithography, ion implantation, etch and chemical vapor deposition.

PROGRAM OUTCOMES

Microelectronics Systems Technology AAS Degree

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

- safely and professionally collaborate in an electronic technology-focused workplace,
- use and comprehend standard electronics terminology in communication,
- identify and isolate technology problems,
- identify electronic components including resistors, capacitors, inductors, diodes, transistors, amplifiers and digital logic gates;
- read specifications, symbols, schematics, ladder diagrams and assembly drawings;
- comprehend AC, DC, amps, volts, ohms, impedance, watts, frequency, apparent and reactive power;
- operate and interpret oscilloscopes, multimeters, signal generators, power supplies;
- assemble, disassemble, adjust and verify electronic equipment performance;
- use test procedures and test equipment to service and maintain equipment,
- demonstrate a comprehensive knowledge of the semiconductor manufacturing process including materials, processes, vacuum systems and quality control;
- apply technical knowledge of sensors and actuators to automated manufacturing and motion control,
- comprehend the theoretical elements of fluid power systems and apply this knowledge to design, installation and repair of industrial equipment;
- program and install PLCs to control manufacturing processes.

PROGRAM OUTCOMES

Microelectronics Systems Technology Certificate Degree

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

- safely and professionally collaborate in an electronic technology focused workplace,
- use and comprehend standard electronics terminology in communication,

- identify electronic compounds including resistors, capacitors, diodes, transistors, amplifiers, and digital logic gates;
- read specifications, symbols, schematics;
- comprehend AC, DC, amps, volts, ohms, impedance, watts, frequency, apparent and reactive power;
- operate and interpret oscilloscopes, multimeters, signal generators, power supplies;
- use test procedures to diagnose electronic equipment,
- demonstrate a basic knowledge of the semiconductor manufacturing process.

CAREERS

Career opportunities may include fabrication technician, equipment technician and product test technician.

For information contact the Manufacturing Department, 503-594-3318.

MICROELECTRONICS SYSTEMS TECHNOLOGY CERTIFICATE

FIRST TERM		CREDITS
EET-112	Electronic Test Equipment & Soldering	3
EET-137	Electrical Fundamentals I	4
MFG-107	Industrial Safety & First Aid	3
MFG-109	Computer Literacy for Technicians	3
MTH-050*	Technical Mathematics I	3
SM-150	Semiconductor Processing I	2
WR-101*	Communication Skills: Occupational Writing	3
SECOND TERM		
EET-139	Principles of Troubleshooting I	2
EET-141	Electrical Fundamentals II	4
EET-157	Digital Logic I	3
ESH-100	Environmental Regulations	2
MTH-080*	Technical Mathematics II	3
SM-160	Semiconductor Processing II	2
THIRD TERM		
EET-127	Semiconductor Circuits I	4
EET-142	Electrical Fundamentals III	4
SM-170	Semiconductor Processing III	2
SM-280	Electronics & Microelectronics/CWE	2
— —	Microelectronics Systems Technology program electives	3
— —	Human Relations requirement (see page 68)	3
Credits required for certificate		55

MICROELECTRONICS SYSTEMS TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

Complete certificate program.

MICROELECTRONICS SYSTEMS TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FOURTH TERM		CREDITS
CH-104	Introductory Chemistry	5
EET-215	Electromechanical Systems I	2
EET-239	Principles of Troubleshooting II	2
MFG-104	Print Reading	2
— —	Microelectronics Systems Technology program electives	3

Continued

*Microelectronics Systems Technology continued...***FIFTH TERM**

EET-250	Linear Circuits	3
MFG-140	Principles of Fluid Power	3
MFG-209	Programming and Automation for Manufacturing	3
SM-136	Photolithography	2
SM-280	Electronics & Microelectronics/CWE	2
MFG-123	Instrumentation & Controls	3

SIXTH TERM

EET-230	Laser and Fiber Optics	3
MFG-133	Programmable Logic Controllers	3
SM-229	Vacuum Technology	2
— —	Microelectronics Systems Technology program electives	6

Credits required for degree 99

**MICROELECTRONICS SYSTEMS TECHNOLOGY
PROGRAM ELECTIVES:**

Any course with an EET, RET, SM, MFG, WLD or CDT prefix not already in the Microelectronics Systems Technology program.

*Substitute college transfer courses for these courses if you plan to continue your education at a higher education institution. It is recommended that you consult with a faculty advisor or a staff member in Student Services for the transfer requirements of the specific advanced program or school.

**ELECTRONICS ENGINEERING TECHNOLOGY
(Oregon Tech transfer courses)**

The Manufacturing Technology Department, in cooperation with Oregon Tech, offers a number of transferable microelectronics classes into Oregon Tech's Electronics Engineering Technology degree program. For information contact the Manufacturing Department, 503-594-3318.



Music Technology

Certificate

The Music Technology certificate gives students the core skills needed to enter the sound and music production industry.

PROGRAM OUTCOMES

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

- complete recording projects illustrating competence in professional audio recording technologies and the ability to complete the production process using appropriate software/hardware,
- complete recording projects that include elements of music and audio in digital format, including MIDI, sound sampling, synthesis, processing, editing, and mixing and display confidence in the use of associated software/hardware appropriate for these tasks in a professional setting;
- produce a final recording project that demonstrates preparedness for entry into a career related to music technology, and articulate how that project relates to professional opportunities in that field;
- critically analyze and discuss multimedia works (their own or others) in the context of music history and/or theory,
- demonstrate an awareness of ethical, legal, and business considerations involved when creating recorded audio works, including basic professional skills related to documentation and rights licensing for copyright, fair use, etc.

CAREERS

Careers include recording engineer, live sound engineer, media and sound post-production for internet companies, sound/music for video games, sound/media engineer for TV, recording/sound for advertising production, video post-production engineer, sound engineer for radio, video production engineer, film sound recording engineer, film post production for mixed media, film post production for sound only, film sound designer (FX), film foley artist, technical support for music production software companies, technical development for music production hardware and software and sound technical development for software companies.

For more information contact Brian Rose, 503-594-3340 or brianr@clackamas.edu

MUSIC TECHNOLOGY CERTIFICATE

FALL TERM		CREDITS
MUS-107	Introduction to Audio Recording I	3
MUS-140	Careers in Music	3
MUS-142	Introduction to Electronic Music I: MIDI	3
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
— —	Music Technology program basics	3-4
— —	Music Technology program electives	2-4

WINTER TERM

COMM-100*	Basic Speech Communication	
or COMM-126	Communication Between the Sexes	
or COMM-140	Introduction to Intercultural Communication	
or COMM-218	Interpersonal Communication	3-4
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II (or higher level of math)	3-5
MUS-108	Introduction to Audio Recording II	3
MUS-141	Introduction to the Music Business	3
MUS-143	Introduction to Electronic Music II: Sequencing & Sampling	3
— —	Music Technology program basics	3-4
— —	Music Technology program electives	2-4

SPRING TERM

MUS-109	Introduction to Audio Recording III	3
MUS-144	Introduction to Electronic Music III: Digital Audio	3
MUS-280	Music/CWE	2
— —	Music Technology program basics	3
— —	Music Technology program electives	2

Credits required for certificate 50-60

*COMM-100 may be substituted by taking all of the following:
COMM-100A, COMM-100B and COMM-100C

MUSIC TECHNOLOGY PROGRAM BASICS

Complete nine credits from the following:

COURSE		CREDITS
MUP-100	Individual Lessons: Non-Music Majors	1
MUS-101	Music Fundamentals	3
MUS-102	Music Fundamentals	3
MUS-103	Music Fundamentals	3
MUS-105	Music Appreciation	3
MUS-111	Music Theory I	3
MUS-112	Music Theory I	3
MUS-113	Music Theory I	3
MUS-131	Group Piano: Piano for Pleasure	1
MUS-132	Group Piano: Piano for Pleasure	1
MUS-133	Group Piano: Piano for Pleasure	1
MUS-134	Group Voice: Anyone Can Sing	1
MUS-135	Group Voice: Anyone Can Sing	1
MUS-136	Group Voice: Anyone Can Sing	1
MUS-137	Group Guitar I: Guitar for Dummies	1
MUS-138	Group Guitar II	1
MUS-205	Music Literature: History of Jazz	4
MUS-206	Music Literature: History of Rock	4

MUSIC TECHNOLOGY PROGRAM ELECTIVES

Complete six credits from the following:

COURSE		CREDITS
MUP-100	Individual Lessons: Non-Music Majors	1
MUP-102	Wind Ensemble	2
MUP-104	Pep Band/Combo-Improv	1
MUP-105	Jazz Ensemble	3
MUP-121	Clackamas Chorale	1
MUP-122	Chamber Choir	3
MUP-125	Voice Jazz Ensemble: Mainstream	3
MUP-141	College Orchestra	1
MUP-241	College Orchestra	1
MUS-101	Music Fundamentals	3
MUS-102	Music Fundamentals	3
MUS-103	Music Fundamentals	3
MUS-105	Music Appreciation	3
MUS-130	Music & Media: Sex, Drugs, Rock & Roll	1
MUS-131	Group Piano: Piano for Pleasure	1
MUS-132	Group Piano: Piano for Pleasure	1

MUS-133	Group Piano: Piano for Pleasure	1
MUS-134	Group Voice: Anyone Can Sing	1
MUS-135	Group Voice: Anyone Can Sing	1
MUS-136	Group Voice: Anyone Can Sing	1
MUS-137	Group Guitar I: Guitar for Dummies	1
MUS-138	Group Guitar II	1
MUS-145	Introduction to Digital Sound, Video & Animation	3
MUS-147	Music, Sound & Moviemaking	1
MUS-148	Live Sound Engineering	3
MUS-205	Music Literature: History of Jazz	4
MUS-206	Music Literature: History of Rock	4
MUS-247	Music, Sound & Moviemaking	3

Nursing

Associate of Applied Science Degree

NURSING ASSISTANT OPTIONS

Being a certified nursing assistant can be a fulfilling, life-long vocation or the first step in your health care career.

NURSING ASSISTANT 1 (CNA 1)

Clackamas Community College Nursing Assistant course provides the student with the skills to perform basic level nursing care. Certified Nursing Assistants are defined by law as people who assist licensed nursing personnel in the provision of nursing care. Content includes: introduction to health care facilities, communication, basic body structure and function, patient needs, preventing infection, body mechanics, and much more. This course is approved by the Oregon State Board of Nursing.

Class times may vary term to term. This one-term course consists of 150 contact hours including 75 hours of lecture and lab and 75 hours of clinical experience. Clinical hours begin the 6th week of the course and are normally done at local Skilled Nursing Centers. Approximate length of the course is 11 weeks.

COURSE OFFERED—SUMMER, FALL, WINTER, SPRING TERMS:

NUR-100	Certified Nursing Assistant 1	7 credits
NUR-100C	Certified Nursing Assistant 1 Clinical	0 credits

Upon successful completion of this 7 credit course, students may apply for the Oregon State Board of Nursing certification exam for nursing assistants (CNA 1).

The cost of the course will include pre-registration requirements such as Criminal background check, American Heart Association CPR for Healthcare Professionals, immunizations and UA drug screen. Course tuition, textbooks, name badge, state exam fee, and a watch with a second hand, uniform and shoes.

READING & WRITING COMPETENCIES:

You will need to prove competency levels in reading and writing. Competency in reading and writing is measured by CCC placement test(s) or previous college coursework (unofficial transcript). Placement exam scores must be at least WR-121 and RD-115 to be eligible to apply or an unofficial transcript indicating WR-095 was taken with a C or better.

Continued

Nursing continued...

You must be at least 18 years of age. High school students may apply with written authorization from their high school counselor. (Proof must be provided.)

Before you will be permitted to enroll you must attend the Nursing Assistant Mandatory Orientation. Specific details can be found in the college's Schedule of Classes and online at www.clackamas.edu/healthsciences/nursingassistant/

NURSING ASSISTANT II – ACUTE CARE TRAINING (CNA 2)

This course is designed to prepare students to perform routine and acute nursing assistant tasks for clients in the following venues: hospital, long-term and skilled care facilities and the community. Instruction incorporates concepts of safety and preventing complications, communicating client responses to the nurse, and documenting/recording outcomes of client care. By Oregon State Board of Nursing regulations, the course is restricted to those who hold a current, unencumbered Oregon CNA 1 license and have their name listed on the CNA Registry. Also, you must be able to demonstrate proficiency in CNA 1 skills during lab sessions. This course meets the minimum state requirements with 42 hours of lecture and lab instruction as well as 30 hours of clinical experience.

COURSE OFFERED--SUMMER, FALL, WINTER, SPRING TERMS:

NUR-101 Certified Nursing Assistant 2 3 credits

Before you will be permitted to enroll you must attend the Nursing Assistant 2 Mandatory Orientation. Specific details can be found in the course schedule and online. For more information email: Health-Sciences-Questions@clackamas.edu

NURSING PROGRAM

Clackamas Community College is a full partner in the Oregon Consortium for Nursing Education (OCNE). The curriculum in OCNE nursing programs is a competency-based curriculum developed in collaboration with Oregon Health & Science University (OHSU) and other community colleges around the state. This curriculum, which has been approved by the Oregon State Board of Education as well as the Oregon State Board of Nursing, can ultimately culminate in a Baccalaureate of Science degree with a focus in nursing offered by OHSU. For more information on the OCNE curriculum, refer to www.ocne.org

Admission into the Nursing program is by special application only. The application is a two-step process. Students must submit application to the Registrar's Office by the deadline. Qualified applicants will progress to the interview/essay portion of the application process. Acceptance to the nursing program allows for co-admission to Clackamas Community College and Oregon Health & Science University School of Nursing.

A physical examination by a licensed healthcare provider, immunizations, criminal history background check, and urine drug testing are required prior to clinical experience in the first term of the program. Drug use and/or conviction of a felony may result in the Oregon State Board of Nursing denying licensure upon graduation.

PROGRAM OUTCOMES

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

- demonstrate the ability to choose personal and professional actions that are based on a set of shared core nursing values,
- demonstrate the effective use of reflection, self-analysis and self-care to develop insight in the delivery of nursing care;
- demonstrate the ability to engage in intentional, life-long learning;
- demonstrate the ability to be an effective leader in nursing and health care,
- demonstrate the ability to collaborate as part of a health care team,
- demonstrate the ability to practice within, utilize, and contribute to the broader health-care system;
- demonstrate the ability to practice relationship-centered care,
- demonstrate the ability to make sound clinical judgments,
- demonstrate the ability to choose and apply the best available evidence.

The OCNE curriculum is designed as a four-year course of study with the first year devoted to pre-admission requirements. The second and third year of designated study will be taken at Clackamas Community College. Upon completion of the CCC nursing program, students will be eligible to receive their Associate of Applied Science degree in nursing and take the national examination (NCLEX-RN) for registered nurse licensure. Graduates of the nursing program at Clackamas Community College should be prepared for entry-level employment as a registered nurse. The student may elect to continue for the fourth year of study, leading to a Baccalaureate of Science degree with a focus in nursing offered by OHSU.

CAREERS

Career opportunities may include but are not limited to entry-level employment as a registered nurse in the acute care setting, sub-acute setting and the ambulatory care setting.

For continuing education opportunities for healthcare providers see Healthcare Professional Development (HPD) in the course description section on page 198.

NURSING APPLICATION REQUIREMENTS

Information regarding the program, the application process and pre-nursing academic advising sessions is available at www.clackamas.edu/HealthSciences/Nursing/

Students are eligible to be considered for admission to the nursing program after completing 30 credit hours of the Prerequisite/Required Preparatory courses listed below. BI-231 (Human Anatomy/Physiology I) must be completed and math competency must be demonstrated prior to submission of program application. Completion of BI-234 prior to entry into the nursing program is strongly recommended. Failure to pass this course during fall term will prevent progression in the nursing program.

A total of 45 credit hours of the Prerequisite/Required Preparatory courses must be completed prior to the start of the first term of the nursing program.

- Minimum Prerequisite/Required Preparatory Course credits to apply: 30
- Prerequisite/Required Preparatory Course credits prior to starting NRS course work during first term of nursing program: 45

Completion of all Prerequisite/Required Preparatory courses must be with a letter grade of C or better. Plus and minus grade will not be factored into the GPA calculations. If a course has been taken more than once, the most recent grade received will be the course considered. Application to the nursing program requires a minimum GPA of 3.0 for all completed Prerequisite/Required Preparatory courses.

NURSING PREREQUISITES/REQUIRED PREPARATORY COURSES

COURSE		CREDITS
BI-231	Human Anatomy/Physiology I	4
BI-232	Human Anatomy/Physiology II	4
BI-233	Human Anatomy/Physiology III	4
FN-225	Nutrition	4
MTH-095	Algebra III	4
PSY-215	Introduction to Developmental Psychology	4
WR-121	English Composition	4
WR-122	English Composition	4
— —	Humanities, Social Science, or Natural Science	13

- The following courses or their equivalents will meet the 8 credit minimum writing requirement:

WR-121, WR-122 and either WR-123 or WR-227 when each course is 3 credits each

WR-121 and WR-122 when each course is 4 credits

- Completion of a previous bachelor's degree at a regionally accredited college or university is considered equivalent to completion of the writing series.
- Students may need to take elective credits in order to meet the 45 credit hour prerequisite minimum required for entry into the nursing program.
- At least six credits must come from Social Sciences
- See list below for approved prerequisite/elective courses

Note: Courses listed above may have prerequisites. See course descriptions for those requirements.

NURSING ASSOCIATE OF APPLIED SCIENCE DEGREE:

FIRST TERM		CREDITS
BI-112*	General Biology for Health Sciences	
or	Biology with genetics	4-5
BI-234	Introductory Microbiology**	4
NRS-110	Foundations of Nursing – Health Promotion	5
NRS-110C	Foundations of Nursing – Health Promotion Clinical	4
PE-185	Physical Education***	0-1

*BI-112 meets the Biology with genetics requirement and must be completed prior to start of second year of nursing program.

** BI-234 must be completed prior to start of second term of nursing program.

*** Current CPR for Healthcare Providers (AHA) is required prior to first term of the first year of the nursing program and meets PE requirement.

SECOND TERM

NRS-111	Foundations of Nursing in Chronic Illness I	3
NRS-111C	Foundations of Nursing in Chronic Illness I Clinical	3
NRS-230	Clinical Pharmacology I	3
NRS-232	Pathophysiological Processes I	3

THIRD TERM

NRS-112	Foundations of Nursing in Acute Care I	2
NRS-112C	Foundations of Nursing in Acute Care I Clinical	4
NRS-231	Clinical Pharmacology II	3
NRS-233	Pathophysiological Processes II	3
— —	Humanities, Social Science or Natural Science electives, if needed	3

SUMMER TERM OPTION

BI-112*	General Biology for Health Sciences	
or	Biology with Genetics	4-5

*BI-112 meets the Biology with genetics requirement and must be completed prior to start of second year of nursing program.

FOURTH TERM

NRS-222	Nursing in Acute Care II & End of Life	3
NRS-222C	Nursing in Acute Care II & End of Life Clinical	6
— —	Humanities, Social Science or Natural Science electives, if needed	6

FIFTH TERM

NRS-221	Nursing in Chronic Illness II & End of Life	3
NRS-221C	Nursing in Chronic Illness II & End of Life Clinical	6
— —	Humanities, Social Science or Natural Science electives, if needed	6

SIXTH TERM

NRS-224	Integrative Practicum	2
NRS-224C	Integrative Practicum Clinical	7
WR-123*	English Composition	
or WR-227	Technical Report Writing	3-4
— —	Humanities, Social Science or Natural Science electives, if needed	4

Credits required for degree 90-93

*Required only if 8 credit writing requirement not previously met.

• Students must achieve C or higher grades in all required courses (including prerequisites/preparatory courses) prior to advancing to the next term.

• Core curriculum is sequential and may not be taken out of order. Core nursing curriculum is intended to be completed in two academic years for an AAS degree.

APPROVED COURSES TO MEET PREREQUISITE/ELECTIVE CREDIT REQUIREMENTS FOR THE NURSING PROGRAM

NOTE: All electives must be taken at the 100 level or higher unless otherwise noted.

HUMANITIES (ARTS & LETTERS)

Courses used in this area must be at least three credits.

Select courses with a prefix of:

ASL, FR, GER, RUS, SPN (other foreign languages are accepted;
languages must be 200 level)

ART, DMC, ENG, HUM (except HUM-100), J, MUP, MUS, PHL, R, TA

COMM (courses numbered COMM-126 and above)

WR (except WR-101, 121, 122, 123 or 227)

Continued

Nursing continued...

SOCIAL SCIENCE

Courses used in this area must be at least three credits.

Select courses with a prefix of:

ANT, EC, GEO, HST, PS, PSY, SOC, SSC, WS

NATURAL SCIENCES (SCIENCE/MATH/COMPUTER SCIENCE)

Courses used in this area must be at least six credits.

Select courses with a prefix of:

ASC, BI* (except BI-163), BOT, CH (except CH-150), CS, ESR, G (except G-119, G-124), GS (except GS-160), MTH (MTH-095** accepted), PH, Z

*Concurrent enrollment required for BI-160/BI-160L or BI-165C/BI-165CL

**MTH-095 may be applied toward prerequisite credits but not toward the BSN degree.

NURSING

NUR-160, NUR-217, NUR-288

BACCALAUREATE OF SCIENCE DEGREE WITH A FOCUS IN NURSING

After receiving the AAS degree in Nursing, students who wish to continue on for their baccalaureate degree may do so through co-admission at OHSU. Students who plan to continue through to OHSU must be aware that to earn their Baccalaureate of Science degree with a focus in Nursing, they must have:

- Two years of the same high school foreign language, or two terms of college-level foreign language credit (includes American Sign Language) or a foreign language proficiency examination.
- MTH-243 Statistics I

COURSE WORK FOR A BACCALAUREATE OF SCIENCE DEGREE WITH A FOCUS IN NURSING THROUGH OHSU WILL INCLUDE THE FOLLOWING NURSING CLASSES:

NRS-410	Population Based Care: Chronic Illness & Health Promotion
NRS-411	Epidemiology
NRS-412	Leadership Outcomes Management in Nursing
NRS-424*	Clinical Immersion I Capstone I or Minor course work
NRS-425	Clinical Immersion II Capstone II or Minor course work

At least 15 credits of elective credit must be taken at the upper division level (300/400 level) for the BS program. These can be taken under a co-enrollment agreement with PSU, Oregon Tech, EOU, or SOU.

*NRS-224 articulates to OHSU for substitution of NRS-424.

Occupational Skills Training

Certificate

The Occupational Skills Training program provides the opportunity for students to receive hands-on training in a specific occupational area. This program is designed for students who need or prefer work-based training to develop their skills. Students may begin their training at any time.

Students participate in supervised and structured work-based training in addition to classroom instruction. The program utilizes local businesses as training sites.

Individualized training plans are developed in consultation with the student, work-site trainer, CCC faculty and program coordinator.

PROGRAM OUTCOMES

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

- complete an individualized training curriculum and employment plan, describing the skills and knowledge necessary to become competitively employable;
- demonstrate the ability to contact employers beyond what would ordinarily be available through an application process,
- demonstrate an increase in occupational skills through hands-on training provided by an employer and through general education and occupation-related classroom instruction.

CAREERS

Career opportunities may be available in a variety of occupations, depending on the goals, skills and aptitude of the student and the availability of local training sites.

For information contact Student Academic Support Services Department, 503-594-3475, or www.clackamas.edu/Advising/

OCCUPATIONAL SKILLS TRAINING CERTIFICATE

PROGRAM REQUIREMENTS

OST-180	Occupational Skills Training/CWE	24
— —	Occupational related courses	15

RELATED INSTRUCTION REQUIREMENTS

MTH-050	Technical Mathematics I	3
WR-101	Communication Skills: Occupational Writing	3
— —	Human Relations requirement (see page 68)	3

Credits required for certificate **48**

Paraeducator

Certificate

The Paraeducator Certificate is designed for those who would like to work as instructional assistants in educational settings. The certificate prepares students to resolve everyday challenges and to professionally support teachers in planning, presenting and evaluating instruction and learning. The paraeducator's responsibilities include assisting small-group instruction in reading, math, spelling, assisting individual students in the above academic areas and self-help skills, daily-living skills, following behavior programs as directed by the teacher, and preparing and assembling materials. The particular responsibilities assigned to a paraeducator (instructional assistant) depend on the program and personnel in each school. Employment opportunities exist in surrounding areas as a result of the present legislative support for equal education for students with special needs. The program is designed for persons of all ages, races, cultures and economic backgrounds. The program values and encourages diversity in the field of education.

Course work provides a basic foundation in theory and practical application in how children learn, teaching strategies, developing positive relationships with students, integrating current technology into the learning environment, addressing the needs of special-needs students and the role of the classroom in a multicultural society.

Course work includes Related Instruction requirements, cooperative work experience and core courses in education, many of which are offered online to meet the needs of currently employed teacher assistants and students exploring educational careers.

The *No Child Left Behind Act of 2002* now mandates that paraeducators who work in Title I schools have two years of college, an associate's degree, or pass a competency test equivalent to sophomore level course work in reading, writing, math and teaching strategies.

PROGRAM OUTCOMES

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

- describe the social, historical, and political foundations of the US system of education as well as the contemporary Issues affecting professional educators;
- demonstrate the academic foundation skills necessary to assist K-12th grade students in classroom settings,
- apply knowledge of learners and the learning process to facilitate student learning and foster productive behaviors,
- employ a variety of instructional strategies in order to assist with planning, instruction, and evaluation of K-12th grade learners;
- apply knowledge about the needs of diverse and exceptional student populations and how to assist these students in the classroom,
- demonstrate the ability to work professionally with students, colleagues, and others in educational settings.

PORTLAND STATE UNIVERSITY TRANSFER AGREEMENT

Portland State University will accept the Paraeducator Certificate as part of a 90 credit Associate of General Studies. Talk with a staff member in Student Life & Leadership, or Paula Hamm at 503-594-3210 for requirements.

CAREERS

Career opportunities may include paraeducator positions in public or private elementary or secondary schools.

For information contact Yvonne Smith, 503-594-3207 or yvonne@clackamas.edu

PARAEDUCATOR CERTIFICATE

FALL TERM		CREDITS
ED-100	Introduction to Education	1
ED-113	Instructional Strategies in Reading & Language Arts	3
ED-131	Instructional Strategies	3
WINTER TERM		
ED-169	Overview of Students with Special Needs	3
ED-200	Foundations of Education	3
ED-229	Learning and Development	3
ED-280	Practicum/CWE	3
SPRING TERM		
ED-114	Instructional Strategies in Math and Science	3
ED-130	Comprehensive Classroom Management	3
ED-254	Instructional Strategies for Dual Language Learners	3
ED-258	Multicultural Education	3
SUMMER TERM		
ED-235	Educational Technology	3
MTH-065	Algebra II	4
WR-121	English Composition	4
— —	General electives (any college level course)	4
<i>Credits required for certificate</i>		46



Professional Truck Driver

Certificate

The Professional Truck Driver program provides the necessary training for employment within the Transportation and Logistics field. Course work covers rules, regulations and practices, practical applications, customer service skills, and Commercial Driver's Licensing (CDL) training provided in conjunction with the IITR truck driving school. This four class series is part of a statewide program designed to put you in the driver's seat of an exciting career.

PROGRAM OUTCOMES

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

- use the necessary skills to take the Commercial Driving License exam and be qualified for employment in the transportation and logistics industry;
- maintain logbooks and other written records as required by the I.C.C. and other agencies, as well as employers;
- operate vehicles of multiple configurations safely on surface streets, highways, and freeways, complying with all regulations and provide excellent customer service throughout the distinct seasonal weather challenges.

CAREERS

Career opportunities include short and long haul trucking, delivery services, public transportation, supply and logistics management, and dispatching.

For information contact the Automotive Department at 503-594-3051 or Dave Bradley at bradleyd@clackamas.edu

PROFESSIONAL TRUCK DRIVER CERTIFICATE:

COURSE		CREDITS
TTL-101	Introduction to Professional Truck Driving & Logistics	4
TTL-121	Practical Applications in Professional Truck Driving & Logistics	6
TTL-141	Transportation & Logistics Customer Service Skills	1-3
TTL-180	Transportation & Logistics/CWE	6
<i>Credits required for certificate</i>		<i>17-19</i>



Project Management

Associate of Applied Science Degree

Upon completion of the two-year Project Management Associate of Applied Science (AAS) Degree program, students with appropriate work experience are qualified to sit for the national certification examination in project management and to earn the PMP professional designation.

PROGRAM OUTCOMES

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

- identify project management's five process group along with primary activities associate with each,
- successfully employ common project management tools, such as a work breakdown structure, network diagram, risk assessment, and earned value management,
- demonstrate effective interpersonal communications, especially meeting and stakeholder management,
- list and explain key motivational, influence, and conflict management techniques,
- deliver persuasive and informative presentations,
- employ common software tools for project management,
- analyze scenarios to determine appropriate responses to ethical dilemmas within the context of a defined scenario, plan, execute, control, and close a project;
- demonstrate appropriate written communication—emails, memos, and reports;
- develop and maintain budgets to track financial and human resources,
- manage a project from initiation through closing, ensuring that stakeholder requirements have been met.

CAREERS

Careers include project and program management, project portfolio management, and project administration. Potential job titles include project manager, program manager, project scheduler, cost estimator, project portfolio manager, project administrator, project leader, project office manager/director, procurement planner/analyst, procurement assistant, project assistant, and project coordinator.

For more information contact Bill Waters, 503-594-3079 or billw@clackamas.edu

PROJECT MANAGEMENT

ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
BA-120	Project Management Fundamentals	3
BA-122	Teamwork	3
BA-123	Leadership & Motivation	3
BA-131	Introduction to Business Computing	4
— —	PE/Health/Safety/First Aid requirement (see page 68)	1
WINTER TERM		
BA-111 or BA-211	General Accounting Financial Accounting I	4
BA-125	Advanced Project Management Tools	5
BT-177	Microsoft Project	3
WR-121	English Composition	4

SPRING TERM

BA-101	Introduction to Business	4
BA-124	Negotiation	3
BA-126	Project Management Workshop	3
BA-217	Budgeting for Managers	3
CS-135S	Microsoft Excel or any BA/BT course not already used in Project Management program	3

**PROJECT MANAGEMENT
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
BA-205	Business Communications with Technology	4
BA-223	Principles of Marketing	4
BA-285	Human Relations in Business	4
MTH-065	Algebra II	4

WINTER TERM

BA-206	Management Fundamentals	4
BA-226	Business Law I	4
COMM-111	Public Speaking	4
— —	Any BA/BT course not already used in Project Management Program	3

SPRING TERM

BA-225	Business Report Writing	
or WR-227	Technical Report Writing	3-4
BA-268	Applied Project Demonstration	3
BA-280	Business/CWE	3
— —	Any BA/BT course not already used in Project Management program	4

Credits required for degree

90-91

Project Management

Certificate

This program is designed for students who are interested in upgrading their professional skills, those who want to learn new and valuable interpersonal skills and those who might be interested in pursuing the two-year Project Management Associate of Applied Science (AAS) Degree.

PROGRAM OUTCOMES

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

- successfully employ common project management tools, such as a work breakdown structure, network diagram, risk assessment, and earned value management;
- demonstrate effective interpersonal communications, especially meeting and stakeholder management;
- list and explain key motivational, influence, and conflict management techniques;
- employ common software tools for project management;
- analyze scenarios to determine appropriate responses to ethical dilemmas within the context of a defined scenario, plan, execute, control, and close a project.

CAREERS

Career opportunities include career enhancement such as more marketable skills in one's current employment or job opportunities in a project management training program.

For more information contact Bill Waters, 503-594-3079 or billw@clackamas.edu

PROJECT MANAGEMENT CERTIFICATE

COURSE		CREDITS
BA-120	Project Management Fundamentals	3
BA-122	Teamwork	3
BA-123	Leadership and Motivation	3
BA-124	Negotiation	3
BA-125	Advanced Project Management Tools	5
BA-126	Project Management: Workshop	3
BT-177	Microsoft Project	3

Credits required for certificate

23

Project Management Leadership & Communication

Career Pathway Certificate

This program is designed for students with prior project management experience who want to build their interpersonal skills, including effective approaches to leadership and motivation, group dynamics, conflict, power, and organizational behavior. This program also provides a solid grounding in effective written and oral communication techniques, including meeting management, presentations, reports and correspondence. Since project managers typically spend over 80 percent of their time interfacing with people—communicating—these skills are critical to successful project management.

PROGRAM OUTCOMES

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

- demonstrate effective interpersonal communications, especially meeting and stakeholder management;
- list and explain key motivational, influence, and conflict management techniques;
- deliver persuasive and informative presentations;
- analyze scenarios to determine appropriate responses to ethical dilemmas;
- demonstrate appropriate written communication--emails, memos, and reports.

For more information contact Bill Waters, 503-594-3079 or billw@clackamas.edu

**PROJECT MANAGEMENT LEADERSHIP & COMMUNICATION
CAREER PATHWAY CERTIFICATE**

COURSE		CREDITS
BA-122	Teamwork	3
BA-123	Leadership & Motivation	3
BA-124	Negotiation	3
BA-205	Business Communications with Technology	4
BA-285	Human Relations in Business	4
COMM-111	Public Speaking	4

Credits required for certificate

21

Project Management Tools & Techniques

Career Pathway Certificate

This program is designed for students with prior project management experience and good interpersonal skills who want to develop their technical competencies in project management. It provides a foundation in fundamental project processes such as initiation, planning, execution, monitoring and control, and closing. The program also focuses on management techniques, such as project management. The software programs, Microsoft Project and Excel, are employed for project estimating, scheduling, tracking, and analysis. This program provides the tools and techniques required for successful project management.

PROGRAM OUTCOMES

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

- identify project management's five process groups along with primary activities associate with each,
- successfully employ common project management tools, such as a work breakdown structure, network diagram, risk assessment, and earned value management;
- employ common software tools for project management within the context of a defined scenario, plan, execute, control, and close a project;
- develop and maintain budgets to track financial and human resources.

For more information contact Bill Waters, 503-594-3079 or billw@clackamas.edu

PROJECT MANAGEMENT TOOLS & TECHNIQUES CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
BA-120	Project Management Fundamentals	3
BA-125	Advanced Project Management Tools	5
BA-126	Project Management Workshop	3
BA-217	Budgeting for Managers	3
BT-177	Microsoft Project	3
CS-135S	Microsoft Excel	3
Credits required for certificate		20

Renewable Energy Technology

Certificate

Associate of Applied Science Technology

The Renewable Energy Technology (RET) program provides technical training for employment in the field of manufacturing, installation and maintenance of renewable energy systems and products. Graduates will be prepared to integrate, install and make repairs related to equipment and controls.

This program takes a broad-based approach to training renewable energy technicians, with emphasis on mechanical and electro-mechanical systems, fluid power, instrumentation and controls as well as systems troubleshooting. RET graduates will be prepared to work in the capacity of a technician with specialized skills in energy system measurement, energy efficiency, system design and electronic controls.

PROGRAM OUTCOMES

Renewable Energy Technology AAS Degree

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

- communicate effectively through technical drawings to determine product and customer specifications in building systems, energy products and thermal components;
- diagnose and repair electromechanical systems,
- design, install and troubleshoot electrical and fluid power controls related to energy system integration;
- analyze potential energy sources and select appropriate technologies,
- perform a residential energy audit, recommend and implement remediation measures;
- communicate the pros and cons of renewable energy technologies to a diverse user base,
- determine the financial feasibility of a project through the mathematical analysis of thermal and electrical energy problems.

PROGRAM OUTCOMES

Renewable Energy Technology Certificate Degree

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

- communicate effectively through technical drawings to determine product and customer specifications in building systems, energy products and thermal components;
- diagnose and repair electromechanical systems,
- design, install and troubleshoot electrical and fluid power controls related to energy system integration;
- analyze potential energy sources and select appropriate technologies,
- perform a residential energy audit, recommend and implement remediation measures;
- communicate the pros and cons of renewable energy technologies to a diverse user base.



CAREERS

Career opportunities include residential/commercial energy systems integrator, energy audit and efficiency technician, energy systems installer, photo-voltaic (PV) manufacturing and industrial maintenance technician, wind turbine technician, limited renewable technician; PV, geothermal and solar thermal technicians. Additional opportunities exist in the utilities and building trades.

For information contact the Manufacturing Department at 503-594-3318

RENEWABLE ENERGY TECHNOLOGY CERTIFICATE

FIRST TERM		CREDITS
MFG-109	Computer Literacy for Technicians	3
MFG-130	Basic Electricity I	3
MTH-050	Technical Mathematics I	3
RET-200	Renewable Energy Systems	4
RET-240	Alternative Fuel Systems	4

SECOND TERM

EET-139	Principles of Troubleshooting	2
MFG-107	Industrial Safety & First Aid	3
MFG-131	Basic Electricity II: Motors & Controls	3
MTH-080	Technical Mathematics II	3
RET-209	Renewable Energy I: Energy Efficiency	3

THIRD TERM

MET-170	Manufacturing Processes	3
RET-211	Renewable Energy II: System Fundamentals	3
RET-280	Renewable Energy Technology/CWE	2
WR-101	Communication Skills: Occupational Writing	3
— —	Human Relations requirement (see page 68)	3
— —	Renewable Energy Technology program elective	3

Credits required for certificate 48

**RENEWABLE ENERGY TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR**

Complete certificate program.

**RENEWABLE ENERGY TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FOURTH TERM		CREDITS
EET-215	Electromechanical Systems I	2
EET-239	Principles of Troubleshooting II	2
HUM-180	Pathway to Sustainability	
or HUM-181	Pathway to Sustainability	
or HUM-182	Pathway to Sustainability	5
MFG-104	Print Reading	2
RET-213	Renewable Energy III: Installation & Maintenance	3
— —	Renewable Energy Technology program elective	3

FIFTH TERM

MFG-123	Instrumentation and Controls	3
MFG-140	Principles of Fluid Power	3
MFG-209	Programming & Automation for Manufacturing	3
RET-215	Renewable Energy IV: Systems Design	3
— —	Renewable Energy Technology program elective	3

SIXTH TERM

MFG-133	Programmable Logic Controllers	3
MFG-221	Materials Science	3
RET-217	Renewable Energy Capstone	3
RET-280	Renewable Energy Technology/CWE	2
— —	Renewable Energy Technology program elective	6

Credits required for degree 97

RENEWABLE ENERGY TECHNOLOGY PROGRAM ELECTIVES

Any course with a CDT, EET, GIS, MET, MFG, RCT, RET, SM or WLD prefix.

Energy Systems Maintenance Technician

Career Pathway Certificate

The Energy Systems Maintenance Technician certificate provides students with the basic technical skills and principles to support manufacturing, installation and maintenance, and electronics and communication engineers related to renewable energy.

PROGRAM OUTCOMES

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

- communicate effectively through technical drawings to determine product and customer specifications in building systems, energy products and thermal components;
- diagnose and repair electromechanical systems,
- design, install and troubleshoot electrical and fluid power controls related to energy system integration;
- analyze potential energy sources and select appropriate technologies,
- perform a residential energy audit, recommend and implement remediation measures;
- communicate the pros and cons of renewable energy technologies to a diverse user base.

CAREERS

Career opportunities include employment in the field of manufacturing, installation and maintenance of renewable energy production.

For information contact the Manufacturing Department at 503-594-3318.

**ENERGY SYSTEMS MAINTENANCE TECHNICIAN
CAREER PATHWAY CERTIFICATE**

COURSE		CREDITS
EET-139	Principles of Troubleshooting	2
MFG-104	Print Reading	2
MFG-107	Industrial Safety & First Aid	3
MFG-130	Basic Electricity	3
MTH-050	Technical Mathematics I	3
RET-200	Renewable Energy Systems	4
— —	Energy Systems Maintenance Technician program electives	6-8

Credits required for certificate 23-25

Continued

*Energy Systems Maintenance Technician continued...***ENERGY SYSTEMS MAINTENANCE TECHNICIAN
PROGRAM ELECTIVES**

Select 6-8 Elective credits from the following:

COURSE		CREDITS
MET-170	Manufacturing Processes	3
MFG-111	Machine Tool Fundamentals I	6
RET-209	Renewable Energy I: Energy Efficiency	3
WLD-150	Welding Processes	4
or WLD-102	Introduction to Welding	2

Retail Management

Certificate

This certificate is sponsored by members of the retail industry and is recommended for students currently working retail sales positions or those students who would like to work in retail sales and progress into management roles and responsibilities. Course work is specific to the retail industry and focuses on preparing retail employees for upward mobility.

PROGRAM OUTCOMES

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

- identify effective human relations and leadership strategies,
- communicate effectively using written documents, spreadsheets, and slide presentations;
- demonstrate an understanding of marketing concepts,
- analyze and evaluate the legal, procedural and ethical impacts of personnel management decisions,
- evaluate retail management strategies to make sound decisions.

CAREERS

Career opportunities include retail clerks, cashiers, manager trainees, sales associates, and other similar positions in all types of retail establishments.

For information contact Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

RETAIL MANAGEMENT CERTIFICATE**FALL TERM**

BA-104*	Business Math	3
BA-131	Introduction to Business Computing	4
COMM-111	Public Speaking	4
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4

WINTER TERM

BA-111	General Accounting I	4
BA-205	Business Communications with Technology	4
BA-206	Management Fundamentals	4
BA-223	Principles of Marketing	4

SPRING TERM

BA-224	Human Resource Management	4
BA-249	Retailing	3
BA-285	Human Relations in Business	4
— —	Any BA/BT course not already included in the Retail Management program	4

Credits required for certificate

45-46

*For this certificate, BA-104 meets the Related Instruction Computation requirement.

Courses in this program can be applied to partially satisfy elective requirements in the Business AAS degree.

Western Association of Food Chains (WAFC) Retail Management

Certificate

This certificate is sponsored by members of the retail industry and is recommended for students currently working in retail sales positions or those students who would like to work in retail sales and progress into management roles and responsibilities. Course work is specific to the retail industry and focuses on preparing retail employees for upward mobility.

PROGRAM OUTCOMES

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

- identify effective human relations and leadership strategies,
- communicate effectively using written documents, spreadsheets, and slide presentations;
- demonstrate an understanding of marketing concepts,
- analyze and evaluate the legal, procedural and ethical impacts of personnel management decisions,
- interpret and analyze financial information to make budget forecasts and analyses,
- evaluate retail management strategies to make sound decisions.

CAREERS

Career opportunities include retail clerks, cashiers, manager trainees, sales associates and other similar positions in all types of retail establishments.

For information contact Sharon Parker, 503-594-3075 or sharonp@clackamas.edu

**WESTERN ASSOCIATION OF FOOD CHAINS (WAFC)
RETAIL MANAGEMENT CERTIFICATE**

COURSE		CREDITS
BA-104	Business Math	3
BA-217	Budgeting for Managers	3
BA-131	Introduction to Business Computing	4
BA-214	Business Communications	
or BA-205	Business Communications with Technology	3-4
BA-206	Management Fundamentals	4
BA-223	Principles of Marketing	4
BA-224	Human Resource Management	4
BA-249	Retailing	3
BA-285	Human Relations in Business	4
<i>Credits required for certificate</i>		32-33

Note: This certificate is designed to be completed in less than one year.

Most courses in this program can be applied to partially satisfy elective requirements in the Business Management certificate.

Urban Agriculture

Certificate

This certificate focuses on an ecological systems approach to sustainable farming principles and practices suitable for local food crop production through intensive classroom and on-farm experience. Many classes have a lab component which allows students to have the opportunity to learn organic systems, and production methods for vegetable, grain, and fruit crops. Students may begin this program Fall, Winter, or Spring term.

PROGRAM OUTCOMES

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

- apply sustainable, organic methods in the planning, planting, management and harvesting of food crops;
- select and properly use farm equipment that is appropriate for a given scale and system of farming,
- implement organic IPM strategies in orchards and on small scale vegetable and berry farms,
- use a basic understanding of soil science and irrigation systems to make ecologically sound decisions in the production of food crops,
- write a business plan and identify the various regulations that impact an organic food producer,
- effectively communicate with co-workers and customers through speaking, writing and computer technology;
- pass the ODA Pesticide Laws & Safety exam.

CAREERS

The Urban Agriculture certificate prepares graduates to operate their own farm or community food system endeavor. Graduates will be qualified to run small-scale farms, work closely with existing farmers, and be advocates of local food systems, utilizing firsthand experience to become new farmers in the principles and techniques needed to be successful producers of specialty crops incorporating local organic production methods. Other career opportunities include working and managing small farms, community gardens, farmers markets, and school gardens.

For information contact Renee Harber, Horticulture advisor, 503-594-3294 or rharber@clackamas.edu

URBAN AGRICULTURE CERTIFICATE

FALL TERM		CREDITS
HOR-124	Food Harvest	3
HOR-125	Food Production in the Willamette Valley	3
HOR-235	Weed Identification	2
HOR-250	Western Herbs	2
MTH-050	Technical Mathematics I	
or MTH-065	Algebra II (or higher level math)	3-5
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
WINTER TERM		
BA-250	Small Business Management	3
HOR-135	Propagation of Edible Plants	3
HOR-136	Urban Agriculture Practicum/Winter	6
HOR-216	Integrated Pest Management	3
HOR-231	Irrigation & Drainage Design	3
SPRING TERM		
HOR-120	Pesticide Laws & Safety	1
HOR-140	Soils	3
HOR-141	Urban Agriculture Practicum/Spring	6
HOR-148	Farm Equipment	3
HOR-246	Organic Farming and Gardening	3
SUMMER TERM		
COMM-100*	Basic Speech Communication	3
HOR-146	Fruit and Berry Growing	3
HOR-284	Urban Agriculture Farm Experience/CWE	3
HOR-285	Urban Agriculture/CWE	3
<i>Credits required for certificate</i>		62-65

*COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C



Water & Environmental Technology

Professional Upgrade Certificate

Associate of Applied Science Degree

The Water & Environmental Technology program provides career technical classes combined with field experience. Classes are offered in day/evening combinations and have enrollment limits to enhance instructional quality and job placement.

Course work emphasizes fundamental aspects of drinking water distribution, drinking water treatment, wastewater collection and wastewater treatment. Course work includes 240 hours of industry cooperative work experience, laboratory methods in environmental chemistry, aquatic microbiology and preparation for the provisional operator certification exams.

PROGRAM OUTCOMES

Water & Environmental Technology AAS Degree

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

- successfully pass the state required level-1 licensure exams for Oregon wastewater treatment and collection systems, additionally pass the Washington State Operator In Training exams in water treatment and distribution;
- maintain and operate water and waste water treatment facilities and collection and water distribution systems,
- utilize mathematical skills to solve licensure exam problems as well as situations experienced at water and waste water facilities,
- conduct and document scientific laboratory experiments as applied to the water and waste water industry and effectively communicate determined quantitative relationships using both graphs and equations,
- exhibit good teamwork skills and serve as effective members of laboratory and project teams,
- articulate and justify technical solutions to an audience through oral, written, and graphical communication,
- communicate the importance of safety in operator daily activities and be good stewards of ethical and professionally work place interactions.

PROGRAM OUTCOMES

Water & Environmental Technology Certificate Degree

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

- successfully pass the state required level-1 licensure exams for Oregon wastewater treatment and collection systems, additionally pass the Washington State Operator In Training exams in water treatment and distribution;
- maintain and operate water and waste water treatment facilities and collection and water distribution systems,

- utilize mathematical skills to solve licensure exam problems as well as situations experienced at water and waste water facilities,
- conduct and document scientific laboratory experiments as applied to the water and waste water industry and effectively communicate determined quantitative relationships using both graphs and equations,
- exhibit good teamwork skills and serve as effective members of laboratory and project teams,
- articulate and justify technical solutions to an audience through oral, written, and graphical communication,
- communicate the importance of safety in operator daily activities and be good stewards of ethical and professionally work place interactions.

CAREERS

Career opportunities include water and/or liquid waste treatment plant and system operator, environmental science technician and environmental engineering technician. Careers also include environmental lab technician, source control technician, surface water specialist and environmental regulator.

For information contact Matthew LaForce 503-594-3148 or laforce@clackamas.edu

WATER & ENVIRONMENTAL TECHNOLOGY CERTIFICATE

FALL TERM		CREDITS
CH-104	Introductory Chemistry	
or CH-221	General Chemistry	5
MTH-082A	Wastewater Math I	1
MTH-082B	Waterworks Math I	1
WET-110	Wastewater Operations I	3
WET-111	Waterworks Operations I	3
WR-101	Communication Skills: Occupational Writing	
or WR-121	English Composition	3-4
COMM-100*	Basic Speech Communication	
or PSY-101	Human Relations	3
WINTER TERM		
BI-204	Elementary Microbiology	4
MTH-082C	Wastewater Math II	1
MTH-082D	Waterworks Math II	1
WET-120	Wastewater Operations II	3
WET-121	Waterworks Operations II	3
WET-122	Water Distribution/Wastewater Collection Systems	3
WET-123	Environmental Chemistry I	3
SPRING TERM		
CS-120	Survey of Computing	4
WET-130	Wastewater Operations III	4
WET-131	Water Treatment	4
WET-132	Collection & Distribution Lab	1
WET-134	Environmental Chemistry II	3
WET-180	Water & Environmental Projects I	5

Credits required for certificate 58-59

*COMM-100 may be substituted by taking all of the following: COMM-100A, COMM-100B and COMM-100C

WATER & ENVIRONMENTAL TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

Complete certificate program.

**WATER & ENVIRONMENTAL TECHNOLOGY
ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR**

FALL TERM		CREDITS
WET-241	Aquatic Microbiology	4
WET-242	Hydraulics/Water & Wastewater	3
WET-245	Instrumentation & Control	4
WET-280	Water & Environmental Projects II	5
WINTER TERM		
GIS-201	Introduction to Geographic Information System	3
MTH-095	Algebra III	
or MTH-111	College Algebra	4-5
SPRING TERM		
BA-131	Introduction to Business Computing	
or CS-121	Computer Applications	3-4
HE-252	First Aid/CPR	3
WET-109	Backflow Assembly Operation and Testing	3
<i>Credits required for degree</i>		<i>90-93</i>

PROFESSIONAL UPGRADE COURSES

The following courses are designed to upgrade professional skills and in some cases assist in preparation for state certification examinations.

COURSE	CEU/CREDITS
WET-009	Certification Review/Wastewater Operators (CEU)
WET-009	Certification Review/Waterworks Operators (CEU)
WET-009	Cross Connect. Backflow Assembly Tester (4.0 CEU)
WET-009	Cross Connection Specialist Course (3.2 CEU)
WET-009	Equipment Maintenance & Repair (CEU)
WET-009	Pretreatment (CEU)
WET-009	Water & Wastewater Short Schools (2.1 & 2.3 CEU)
WET-010	Wastewater Operations I 3 credits
WET-011	Waterworks Operations I 3 credits
WET-020	Wastewater Operations II 3 credits
WET-021	Waterworks Operations II 3 credits
WET-030	Wastewater Operation III 3 credits
WET-031	Water Treatment 3 credits

High Purity Water

Certificate

The High Purity Water certificate program provides classes and hands-on experience with advanced water treatment methods used in the high-tech industry. The certificate program has been developed in cooperation with Intel Corporation. Based on student demand WET-125 and WET-135 may be offered biannually.

PROGRAM OUTCOMES

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

- correctly operate and maintain SCADA equipment and other instrumentation involved in the general operation of facilities where high purity water is produced,
- perform calculations related to electrical circuit operation and hydraulics,
- correctly use reverse osmosis-based equipment to manufacture high purity water.

CAREERS

Career opportunities include high-purity lab technician and high-purity production technician.

For information contact Matthew LaForce, 503-594-3148 or laforce@clackamas.edu

HIGH PURITY WATER CERTIFICATE

FALL TERM		CREDITS
WET-245	Instrumentation & Control	4
WINTER TERM		
MTH-082E	Math for High Purity Water	1
WET-125	High Purity Water Production I	3
SPRING TERM		
WET-135	High Purity Water Production II	4
WET-180	Water & Environmental Projects I	5
<i>Credits required for certificate</i>		<i>17</i>

Web Design & Development

Associate of Applied Science Degree

The Web Design & Development program prepares students for technical positions related to web programming and design. This multidisciplinary program incorporates classes from computer science, art, English, and business. Course work includes computer graphics and design, web development with a focus on current industry standards, web server administration, data-driven web programming, multimedia and animation, and technical writing. Cooperative Work Experience (CWE) is supervised real-world employment that supplements the academic classroom environment.

PROGRAM REQUIREMENTS

Prerequisites for first term classes include completing course work for CS-120 Survey of Computing, WR-095 Paragraph to Essay, and MTH-060 Algebra I or placement in BA-131 Introduction to Business Computing, WR-121 English Composition and MTH-065 Algebra II. This is an open program. Students may take any class in the program for which they have completed the prerequisite.

PROGRAM OUTCOMES

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

- demonstrate all the program learning outcomes of the Web Design Certificate,
- create sophisticated custom logos, graphics, and animations for a wide variety of client applications,
- describe the significance of relational databases to web development and apply these database concepts along with server-side scripting technologies towards the creation of data-driven web applications,
- interview and communicate with clients to create web applications that match client vision, personality, and needs,
- describe and complete the steps to begin a consulting business, including initial market research, marketing plans, and budgeting;
- exhibit good teamwork skills and serve as effective members of project teams.

Continued

Web Design & Development continued...

CAREERS

Career opportunities may include web designer/consultant, webmaster, web programmer, web systems specialist, and graphic designer.

For information contact Debra Carino, 503-594-3170 or dcarino@clackamas.edu

WEB DESIGN & DEVELOPMENT

ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

FALL TERM		CREDITS
ART-225	Computer Graphics I	3
CS-125H	HTML & Web Site Design	3
CS-140	Introduction to Operating Systems	4
CS-150	Computer Technician Orientation	3

WINTER TERM

CS-133S	Introduction to JavaScript & Server Side Scripting	3
CS-179	Networking I	
or CS-275	Database Design	3
CS-181	CMS Web Development	3
CS-195	Flash Web Development	3

SPRING TERM

CS-135I	Advanced Web Design with Dreamweaver	3
CS-240L	Linux Administration	4
CS-234A	AJAX Web Development	3
CS-234P	PHP/MySQL Web Development	3

SUMMER TERM

CS-280	Computer Science/CWE	3
MTH-065	Algebra II	4
WR-121	English Composition	4
— —	Human Relations requirement (see page 68)	3-4

WEB DESIGN & DEVELOPMENT

ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FALL TERM		CREDITS
ART-226	Computer Graphics II	3
CS-135DB	Microsoft Access	3
CS-280	Computer Science/CWE	3
WR-122	English Composition	4

WINTER TERM

CS-240W	Windows Desktop Administration	3
CS-275	Database Design	3
CS-280	Computer Science/CWE	3
WR-227	Technical Report Writing	4
— —	PE/Health/Safety/First Aid requirement (see page 68)	1

SPRING TERM

ART-221	Flash Animation: Design & Techniques	3
ART-227	Computer Graphics III	3
BA-103	Business Strategies for Computer Consultants	3
CS-289	Web Server Administration	4
CS-297W	Website Capstone	3

Credits required for degree 95-96

Web Design

Certificate

The Web Design program should prepare students for technical positions related to web and graphic design.

This multidisciplinary program incorporates classes from computer science and art. Course work includes a strong emphasis on computer graphics and design, data communications theory, operating systems, and web design with a focus on current industry standards. Cooperative Work Experience (CWE) is supervised real-world experience that supplements the academic classroom environment.

PROGRAM REQUIREMENTS

The Web Design program prepares students for technical positions related to web and graphic design. This multidisciplinary program incorporates classes from computer science, English, and art. Course work includes a strong emphasis on computer graphics and design, data communications theory, operating systems, and web design with a focus on current industry standards. Cooperative Work Experience (CWE) is supervised real-world employment that supplements the academic classroom environment.

PROGRAM OUTCOMES

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

- apply knowledge of current graphic design software to capture or create images for use in client websites,
- use HTML, CSS, JavaScript, and current web editing technologies, to create standards-complaint, professional websites;
- leverage existing component tools to create e-commerce applications that solve real-world problems,
- perform client needs analyses to create web applications that solve real-world problems,
- articulate and justify technical solutions to an audience through oral, written, and graphical communication,
- communicate the importance of professional and ethical responsibilities and be aware of codes of conduct and other sources of guidance for professionally ethical decision making.

CAREERS

Career opportunities include web designer, web production staff, and graphic designer.

For information contact Debra Carino, 503-594-3170 or dcarino@clackamas.edu

WEB DESIGN CERTIFICATE

FALL TERM		CREDITS
ART-225	Computer Graphics I	3
CS-125H	HTML & Web Site Design	3
CS-140	Introduction to Operating Systems	4
CS-150	Computer Technician Orientation	3

WINTER TERM

CS-133S	Introduction to JavaScript & Server Side Scripting	3
CS-179	Networking I	
or CS-275	Database Design	3
CS-181	CMS Web Development	3
CS-195	Flash Web Development	3

SPRING TERM

ART-226	Computer Graphics II	
or CS-240L	Linux Administration	3-4
CS-135I	Advanced Web Design with Dreamweaver	3
CS-234A	AJAX Web Development	3
CS-234P	PHP/MySQL Web Development	3

SUMMER TERM

CS-280	Computer Science/CWE	3
MTH-065	Algebra II	4
WR-121	English Composition	4
— —	Human Relations requirement (see page 68)	3-4

Credits required for certificate 51-53

Welding Technology

Professional Upgrade

Certificate

Associate of Applied Science Degree

This program prepares students for entry into these industries: fabricated structural metal products, motor vehicles and equipment, construction and heavy construction, transportation equipment, ship and boat building and repair, aircraft and parts, self-employment and miscellaneous fabricated metal products.

CCC's welding instructors are American Welding Society (AWS) certified professionals. The program's curriculum is based on the AWS national standard for entry level welders.

Course work focuses on the knowledge and skills to perform:

- Fillet welds and groove welds using:
 - Shielded metal arc welding (SMAW)
 - Gas-metal arc welding (GMAW)
 - Flux-core arc welding (FCAW)
 - Gas-tungsten arc welding (GTAW)
 - Steel, stainless steel and aluminum
 - A variety of different electrodes
- Plasma arc cutting (PAC), air carbon arc cutting (CAC-A) and gouging, manual and automatic oxy-fuel cutting (OFC and OFC-Track Burner) processes
- Knowledge of materials science and welding theory
- Print reading, inspection, quality, safety and shop practices
- Fabrication techniques, including job cost calculations, layout, sketching, bills of material, fitting and cutting welding applied to real projects designed by industry partners

PROGRAM OUTCOMES

Welding Technology AAS Degree

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

- work safely in an industrial environment around machinery, power tools, and chemicals;

- set up, operate, and make adjustments to welding equipment as necessary to demonstrate quality workmanship that meets current American Welding Society (AWS) and industry standards;
- demonstrate the ability to set up and operate oxy fuel cutting equipment, carbon arc cutting and gouging and plasma cutting equipment safely and skillfully;
- apply basic knowledge of blueprint reading to fabricate projects as assigned,
- complete welding projects such as fillet welds and groove welds in all positions with Gas Metal Arc Welding (GMAW), Flux Core Arc Welding (FCAW), and Gas Tungsten Arc Welding (GTAW) that will meet visual inspection criteria based on AWS codes and industry standards;
- perform advanced welding on materials such as stainless steel and aluminum with all welding processes,
- pass AWS D.1.11 structural steel welding certification tests,
- recognize and be able to repair common welding defects according to AWS and industry standards,
- recognize and be able to repair common welding defects according to AWS and industry standards.

PROGRAM OUTCOMES

Welding Technology Certificate Degree

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

- work safely in an industrial environment around machinery, power tools, and chemicals;
- set up, operate, and make adjustments to welding equipment as necessary to demonstrate quality workmanship that meets current American Welding Society (AWS) and industry standards;
- demonstrate the ability to set up and operate oxy fuel cutting equipment, carbon arc cutting and gouging and plasma cutting equipment safely and skillfully;
- apply basic knowledge of blueprint reading to fabricate projects as assigned,
- complete welding projects such as fillet welds and groove welds in all positions with Gas Metal Arc Welding (GMAW), Flux Core Arc Welding (FCAW), and Gas Tungsten Arc Welding (GTAW) that will meet visual inspection criteria based on AWS codes and industry standards;
- perform advanced welding on materials such as stainless steel and aluminum with all welding processes,
- recognize and be able to repair common welding defects according to AWS and industry standards,
- recognize and be able to repair common welding defects according to AWS and industry standards,

CAREERS

Career opportunities include welding, fabrication, construction, production welding, CNC cutting machine operation and sheet metal.

Continued

Welding Technology continued...

SHORT-TERM TRAINING

For students who need a quick-entry strategy into the work force, an individualized education and employment plan can be created that concentrates the knowledge and skills necessary to start or change a career path. Please see a faculty advisor for more information.

For information contact the Manufacturing Department, 503-594-3318.

WELDING TECHNOLOGY CERTIFICATE

FIRST TERM		CREDITS
MFG-107	Industrial Safety & First Aid	3
MTH-050*	Technical Mathematics I	3
WLD-100	Welders' Print Reading I	3
WLD-111	Shielded Metal Arc Welding (Stick)	
or WLD-111A and WLD-111B Shielded Metal Arc Welding (Stick)		8
SECOND TERM		
MFG-109	Computer Literacy for Technicians	3
WLD-113	Gas Metal Arc Welding/Flux-Core Arc Welding (Wirefeed)	
or WLD-113A and WLD-113B Gas Metal Arc Welding/Flux-Core Arc Welding (Wirefeed)		8
WLD-200	Welders' Print Reading II	3
WR-101*	Communication Skills: Occupational Writing	3
THIRD TERM		
MFG-221	Materials Science	3
WLD-110	Welder Certification	1-4
WLD-115	Gas Tungsten Arc Welding (GTAW)	
or WLD-115A and WLD-115B Gas Tungsten Arc Welding (GTAW)		8
WLD-280	Welding Technology/CWE	2
— —	Human Relations requirement (see page 68)	3
<i>Credits required for certificate</i>		<i>51-54</i>

WELDING TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 1ST YEAR

Complete certificate program.

WELDING TECHNOLOGY ASSOCIATE OF APPLIED SCIENCE DEGREE: 2ND YEAR

FOURTH TERM		CREDITS
MFG-111	Machine Tool Fundamentals I	3
WLD-211	Advanced Shielded Metal Arc Welding	4
WLD-250	Welding Fabrication I Beginning Project	4
— —	Welding Technology program elective	3
FIFTH TERM		
WLD-210	Pipe Welding	4
WLD-213	Advanced Gas Metal Arc Welding/Flux-Core Arc Welding	4
WLD-251	Welding Fabrication II Intermediate Project	4
— *	General electives (any college level course)	3
SIXTH TERM		
WLD-215	Advanced Gas Tungsten Arc Welding	4
WLD-252	Welding Fabrication III Advanced Project	4
WLD-280	Welding Technology/CWE	2
— —	Welding Technology program elective	2-4
<i>Credits required for degree</i>		<i>92-97</i>

* Substitute college transfer courses for these courses if you plan to continue your education at a higher education institution. It is recommended that you consult with a faculty advisor or a staff member in Student Services for the transfer requirements of the specific advanced program or school.

WELDING TECHNOLOGY PROGRAM ELECTIVES

COURSE		CREDITS
WLD-102	Introduction to Welding	2
WLD-103	Blacksmithing and Traditional Iron Working	2
WLD-104	Introduction to CNC Plasma Cutting	2
WLD-150	Welding Processes	4
WLD-203	Blacksmithing and Traditional Iron Working II	2
WLD-205	Structural Steel Inspection, Codes & Standards	4
WLD-212	SMAW Pipe Welding	2
WLD-230	CNC Press Brake	2
WLD-261	Special Projects	2

Entry Level Welding Technician

Career Pathway Certificate

This program is designed with core competencies in mind while allowing the student flexibility to take other relevant welding courses.

PROGRAM OUTCOMES

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

- work safely in an industrial environment around machinery, power tools, and chemicals;
- set up, operate, and make adjustments to welding equipment as necessary to demonstrate quality workmanship that meets current American Welding Society (AWS) and industry standards;
- apply basic knowledge of blueprint reading to fabricate projects as assigned.

CAREERS

Career opportunities include entry level jobs in cutting parts, blueprint reading and fitting, tacking, production welding, repair welding and fabrication.

For information contact the Manufacturing Department, 503-594-3318.

ENTRY LEVEL WELDING TECHNICIAN CAREER PATHWAY CERTIFICATE

COURSE		CREDITS
MFG-107	Industrial Safety & First Aid	3
WLD-100	Welders' Print Reading	3
WLD-250	Welding Fabrication I Beginning Project	4
— —	Entry Level Welding Technician program electives	11-12
<i>Credits required for certificate</i>		<i>21-22</i>

ENTRY LEVEL WELDING TECHNICIAN PROGRAM ELECTIVES

COURSE		CREDITS
MFG-111	Machine Tool Fundamentals I	3
WLD-110	Welder Certification	1 or 4
WLD-111	Shielded Metal Arc Welding (Stick)	4 or 8
WLD-113	Gas Metal Arc Welding/Flux-Core Arc Welding (Wirefeed)	4 or 8
WLD-115	Gas Tungsten Arc Welding (GTAW)	4 or 8