



# 2008-2009 CATALOG

Perry Technical Institute

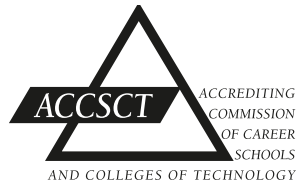


PERRY  
TECHNICAL  
INSTITUTE



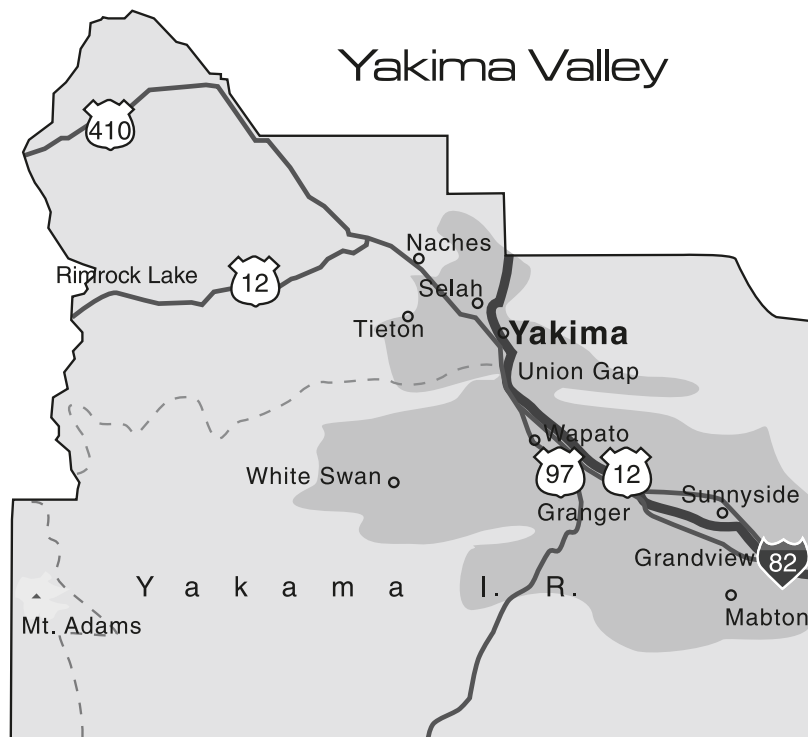
PERRY  
TECHNICAL  
INSTITUTE

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Accredited by the Accrediting Commission of  
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(ACCSC)

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Perry Technical Institute does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. Selected programs of study at Perry Technical Institute are approved by the Workforce Training and Education Coordinating Board's State Approving Agency (WTECB/SAA) for enrollment of veterans and eligible beneficiaries to receive benefits under Title 38 and Title 10, USC.

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**Christine Coté**

## **Message from the President**

Welcome to Perry Technical Institute. As you begin your education here at Perry, you are joining a proud tradition that was established nearly 70 years ago when Harriet I. Perry founded the school as a memorial to her husband, John M. Perry.

At Perry Technical Institute, we focus on equipping our students with the skills that industry demands and the work habits and attitudes that employers seek in their employees. We are proud of our placement rates and of the success achieved by our graduates.

As you begin your training, I encourage you to make the most of your education by committing yourself to positive lifestyle choices, good study habits, regular attendance and punctuality. Your efforts will be rewarded when you graduate and are qualified for a job which pays a living wage and offers benefits and opportunities for advancement.

The administration, faculty and staff at Perry are here to serve you. We are committed to helping you succeed in the classroom and beyond. When you graduate, we will follow your success and take pride in all of your accomplishments.

Christine Coté  
President  
Perry Technical Institute

Catalog certified as true and correct in content and policy.  
May 20, 2008

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## **Mission Statement**

Perry Technical Institute will provide industry with well-trained people who are motivated to work as team members to meet the needs of industry in our rapidly evolving technological world.

## **Vision Statement**

Perry Technical Institute will provide the resources and guidance required to allow students to acquire the knowledge, attitudes and skills to achieve employment and success in their chosen career field.

## **Purpose of the Harriet I. Perry Trust**

“The purpose of this trust is the creation, establishment, erection, equipment, maintenance, and endowment of an educational institution to be located on or near the vicinity of Yakima, Washington, to be known as THE J.M. PERRY INSTITUTE OF TRADE, INDUSTRIES AND AGRICULTURE, to provide courses of instruction and training of a practical nature and confined to the technical area of such trades, industries, and branches of agriculture as shall qualify and prepare the students to enter a gainful occupation and fill working positions in respective fields of trade, industry, and agriculture in which courses of instruction and training shall be given by the Institute. All applicants for admission to the Institute shall be not less than sixteen (16) years of age, and shall possess a high school education or the equivalent thereof, and shall be admitted upon such terms or payment, not to be prescribed with a view to profit, as may be determined by the trustees in the case of each applicant for admission, depending on the merits, fitness, and qualifications to benefit by the courses of instruction given by the Institute, PROVIDED, HOWEVER, that said Institute shall be open to all persons upon equal terms who possess the qualifications established for admission thereto.” (Trust Deed dated December 20, 1939)

## History of Perry Technical Institute

Harriet I. Perry founded Perry Technical Institute in 1939 as a lasting memorial to her husband, the late John M. Perry, a noted pioneer business leader in the Yakima Valley. Although his interests were varied, Mr. Perry's main enterprise was J.M. Perry and Company, a commission house dealing in fruit packing, shipping, cold storage and ice manufacturing. The first warehouse was constructed in 1911 and enlarged in the following years. The Northern Pacific and Union Pacific railroads were among the company's largest ice contracts.

In an unfortunate turn of events in 1938, Mr. Perry suddenly became seriously ill while on a business trip to Fairbanks, Alaska. He needed immediate surgery and was flown to Seattle. The flight was delayed by bad weather and Mr. Perry died at Maynard Hospital in Seattle on October 1, 1938. He was 77 years old.

One year later, Mrs. Perry announced that she was creating a trust fund for the establishment of the J.M. Perry Institute of Trades, Industries and Agriculture. She named three community members to the Board of Trustees: Arthur S. Coffin, Roy A. Matson and Harcourt M. Taylor. Mrs. Perry outlined plans to create a technical school that would train ambitious people in skilled occupations. Curriculum would be streamlined to eliminate non-essentials and enrollment would be open to beginners as well as those students with previous training or experience.

The trustees researched technical schools throughout the United States, gathering information about curriculum, shop construction and equipment. The trustees also searched for a suitable site to build the school. They selected a 54-acre parcel of land adjacent to the airport. Four small farms and houses were located on the property, which was purchased for \$23,000, or approximately \$440 per acre.

Construction of the school's main building began in 1939 and was completed the following year. The total cost of constructing and equipping the building was approximately \$650,000. This modern building included shops, classrooms, administration offices and an auditorium. The school opened its doors to 211 students on January 2, 1941. The original course offerings were: Aircraft Mechanic; Aircraft Engine Mechanic; Aircraft Radio Mechanic; Automotive Mechanic; Automotive, Body and Fender Mechanic; Carpentry; Inside Electrical Wiring; Machine Shop Practice; Machine Shop Practice-Tool Making; Painting, Paper Hanging and Decorating; Plumbing and Heating Sheet Metal; Welding-Electric AC and DC; Welding-Oxyacetylene; and General Shop.

In 1969, Perry Technical Institute became the first private technical school in Washington to be accredited by the Accrediting Commission of Career Schools and Colleges of Technology. The Arlington, Virginia-based organization is a private, non-profit, independent accrediting agency which is recognized by the United States Department of Education as an organization which works to ensure quality education for more than 220,000 students at more than 820 accredited institutions across the United States.

Unprecedented growth in the late 1970s and early 1980s created the need to build and equip three additional buildings on campus – Bond Instrumentation Laboratory, Harvey L. Smith Electrical Technology Building and Burnham Prince Agriculture Mechanics Building. In 1996, the main building was remodeled, adding new classrooms for the Telecommunications Program. A women's restroom was added in the main shop area to accommodate the growing number of women enrolling at the school.

In 1998, crews began constructing a 14,160 square foot building to house the Instrumentation & Industrial Automation Technology Program. The Bond Building, which had housed the program since 1945, continued to be used for two classes. The new Instrumentation Building was dedicated on October 16, 1999, and the first students trained in the building in January 2000.

In July 2004, a fire severely damaged the Bond Building. A new building was constructed to replace the fire-damaged Bond Building. The new building housed a portion of the Instrumentation Program and allowed the Machine Technology Program to relocate to the new building and move out of its outdated shop on the west end of campus. The 17,100 square foot building was dedicated on June 23, 2006.

Over the years, Perry Technical Institute has grown and adapted its curriculum to meet the changing needs of industry. The school's mission, however, has remained unchanged. We serve industry by equipping workers with both technical skills and positive work habits. We serve students of all ages and walks of life by equipping them with the knowledge and skills they need for careers that offer family-supportable wages, job security, benefits and opportunities for advancement.

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## Facilities

The Perry Technical Institute campus is located at 2011 West Washington Avenue on approximately 40 acres of land on the southwest edge of Yakima, Washington, across the street from the Yakima Air Terminal.

The school's facilities include the main building, which houses the Administration Office; the Heating, Ventilation, Air Conditioning & Refrigeration Technology Program; the Information Technology & Communication Systems Program; Computer Applications & Medical Office Administration Program; Computer Applications & Office Administration Program; Customized Training Services; a 700-seat auditorium; and the deli. The Instrumentation Building is located east of the main building; the Smith Electrical Technology building is located behind the main building; the Burnham Prince Automotive/Agriculture Building is on the northwest end of campus; and the Graphic Technology Complex is located the northeast side of campus on South 16th Avenue.

## Academic Calendar 2008-2009

### Automotive, Graphics, HVAC/R, ITCS, Machine, Medical Office Administration and Office Administration

SUMMER QUARTER 2008	June 23 July 4 August 4-15 September 1 September 25 September 25	Summer Quarter Begins Independence Day, No Classes Summer Break Labor Day, No Classes Graduation Summer Quarter Ends
FALL QUARTER 2008	September 29 November 11 November 27-28 December 19 December 19 Dec. 22, 2008-Jan. 2, 2009	Fall Quarter Begins Veteran's Day, No Classes Thanksgiving Holiday, No Classes Graduation Fall Quarter Ends Winter Break
WINTER QUARTER 2009	January 5 January 19 February 16 March 26 March 26 March 30-April 3	Winter Quarter Begins Martin Luther King, Jr. Day, No Classes President's Day, No Classes Graduation Winter Quarter Ends Spring Break
SPRING QUARTER 2009	April 6 May 25 June 19 June 19	Spring Quarter Begins Memorial Day, No Classes Graduation Spring Quarter Ends

### Electrical and Instrumentation & Industrial Automation

SUMMER TRIMESTER 2008	June 23 July 4 August 4-15 September 1 October 23 October 23	Summer Trimester Begins Independence Day, No Classes Summer Break Labor Day, No Classes Graduation Summer Trimester Ends
FALL TRIMESTER 2008/2009	October 27 November 11 November 27-28 Dec. 22, 2008-Jan. 2, 2009 January 5 January 19 February 16 February 26 February 26, 2009	Fall Trimester Begins Veteran's Day, No Classes Thanksgiving Holiday, No Classes Winter Break Return to Class Martin Luther King, Jr. Day, No Classes President's Day, No Classes Graduation Fall Trimester Ends
SPRING TRIMESTER 2009	March 2, 2009 March 30-April 3 May 25 June 19 June 19	Spring Trimester Begins Spring Break Memorial Day, No Classes Graduation Spring Trimester Ends

## Admissions

Perry Technical Institute welcomes prospective applicants who are seeking education in one of the nine training programs offered. Perry Technical Institute admits students of any race/color, sex, creed, marital status, national origin, age and disability to all rights, privileges, programs and activities generally accorded or made available to students at the school. The school does not discriminate on the basis of race/color, sex, creed, marital status, national origin, age or disability in administration of its educational policies, admissions policies, scholarship and loan programs, and other school administered activities. All applicants must be high school graduates or have earned a General Education Development Certificate (GED), and be at least 16 years of age.

### Admissions Procedures

To apply for admission, applicants should contact an Admissions Representative at Perry Technical Institute to request program information and take a tour of the school facilities. Once the applicant has made a decision to apply for admission to Perry Technical Institute, the applicant must complete an application for admission; provide proof of satisfactory completion of high school or equivalent education; and pay a \$35 registration fee. Candidates will confirm they have already received a catalog or will receive one at the time of acceptance to Perry Technical Institute. The Admissions Office will review the application for admission and notify the applicant in writing the status of admission to the school.

### Admissions Requirements

1. Proof of satisfactory completion of high school or equivalent education and valid state-issued photo ID or driver's license.
2. Completed application for admission to Perry Technical Institute with \$35 registration fee.
3. Successful completion of the entrance exam for the appropriate program.
4. Payment of \$500 tuition deposit to ensure a starting date.
5. Sign enrollment contract and attend mandatory student orientation.

Additional documentation may be required depending on the individual program requirements. (The Graphic Technology Program requires two reference forms before the admissions process can be completed. The Automotive Technology Program requires a valid driver's license and a current driving abstract.)

We enroll students based on the date on which their admissions requirements are complete. When classes reach capacity, students are automatically enrolled in the next available start date. Students requesting to be placed on the waiting list will also be automatically enrolled for the next available start date. Students who request a change in enrollment date will be charged a \$35 registration fee at the time of the third request.

## Credit for Previous Education

Because of the specialized nature of the employment preparation offered in Perry Technical Institute courses, credit for previous education or training can be granted only from the successful completion of by-pass (challenge) testing and the recommendation of the appropriate department head, confirmed by the Dean of Education.

## Academic Information

### Attendance Policy

Classes are held from **8:00 a.m. until 3:30 p.m.**, Monday through Friday with the following exception: The Electrical Department starts at 7:47 a.m., which is in compliance with the Department of Labor and Industries to complete extended hours.

**Attendance is mandatory:** Students must maintain a minimum attendance rate of 87% for each term including unexcused and excused absences.

**Probation:** Students will be placed on probation until the end of that school term when they exceed five combined absences (excused/unexcused) in one quarter or seven combined absences (excused/unexcused) in one trimester.

**Dismissal:** Students who exceed 13% combined absences (unexcused and/or excused) in a term may be subject to dismissal.

#### **Standard operating procedure:**

**8:00 a.m. notification:** Students are required to notify the school by 8:00 a.m. each day they are absent or late.

**Clocking in:** Student attendance is recorded by using an electronic time management system. Students are provided with an ID scan card and are required to scan in and out each day. The cost to replace the ID scan card is \$5.

**Externships:** Students leaving campus for an externship are also required to scan their cards at the time they leave.

**Dismissal:** A student scanning or keying another student's card/ID number will be subject to dismissal. Grades, financial aid and Department of Veteran's Affairs agencies sponsoring students are dependent on accurate records of attendance.

**Unexcused absence:** is defined as any attendance irregularity which does not have sanction from an instructor.

**Class cut:** is defined as absence on an unauthorized basis from a class at other than stated break periods, or leaving a class prior to the end of the scheduled instruction period. This is an unexcused absence.

**Probation:** The student will automatically be placed on probation **after two days of unexcused absences in a 20-school-day period.**

**Dismissal:** The student may be dismissed from school **following three consecutive days of unexcused absences.**

**Excused absences:** can be granted for legitimate reasons such as illness, official-legal business appointments, and/or death or serious illness in the immediate family.

**Tardiness:** is defined as entry into class after any scheduled start time.

**Probation:** A student who is tardy **three times in a twenty-school-day period** will be placed on probation.

## Satisfactory Academic Progress Policy

**Definition:** The student must be making satisfactory progress in order to remain eligible for continuous enrollment under regular student status. Students not making satisfactory progress will be placed on probation. A student is graded not only on test scores but also on participation in class, attendance, performance in lab and conduct.

**Students must:** Complete each term with a minimum GPA of 2.0, and the minimum grades established for each subject within the department.

### Probation

If a student has not met the criteria of satisfactory progress at any point during the term the student will be placed on probation. A student is encouraged to meet with his or her instructor for counseling while on probation. A copy of the signed document will be given to the student, the program counselor (if applicable) and the Financial Aid Office and the original is filed in the student's file. If the student has not achieved satisfactory progress by the end of the probation term, he/she may be dismissed.

**Dismissal after three probations:** The school reserves the right to dismiss students who have been on probation three times.

**Repeated terms:** Financial aid programs do not typically pay for repeated terms

### Repeating Quarters/Trimesters

A student failing to maintain satisfactory progress or withdrawing from a class in the middle of a term may petition to repeat the quarter or trimester. Upon successful completion of the repeated quarter or trimester, the student will be granted the grade for the quarter or trimester successfully completed in lieu of the previous grade.

No student will be allowed to repeat quarters or trimesters that result in a total time of enrollment exceeding 1.5 times the specified time for the course.

**It is the school's policy to limit repeated terms to two attempts.**

**Repeating quarters/trimesters may affect financial aid eligibility.**

**All failures requiring the retake of courses will be charged the current academic year quarterly or trimester rate.**

### Termination of Enrollment

**Withdrawal:** Students who voluntarily withdraw from school must complete a Withdrawal Form and have it signed by specified school officials in order to officially close their records.

**Dismissal:** The school reserves the right to dismiss any student for any of the following reasons:

1. Violation of probation
2. Three probations
3. Three consecutive days of unexcused absences
4. Scanning or keying another student's card/ID number for attendance
5. Students who exceed 13% combined absences (unexcused and/or excused)
6. Aggressive, harassing or discriminatory acts against other students or employees
7. Failure to pay tuition
8. Unsatisfactory Satisfactory Academic Progress (SAP)
9. Failure to follow school procedures and policies
10. Acts of theft or dishonesty
11. Failure to comply with safety regulations
12. Malicious damage to school property
13. Insubordinate acts against staff or other Perry Technical Institute employees
14. Illegal drug/alcohol abuse

The Dean of Education will conduct a full hearing of the facts and make a recommendation to the President. The authority to dismiss a student is vested only in the President and the President's decision following a review of the facts is final.

### Appeal Procedure

A student who has been dismissed and wishes to appeal that decision must submit a letter to the school President. The letter must describe any and all circumstances deserving of further consideration. The President will convene an appeal committee consisting of the department head, instructor and a designated representative of the school in order to review the appeal. The student will be notified within one week of the official determination.

### Class/Program Cancellations

Perry Technical Institute makes every effort to meet the needs and desires of its students; however, special circumstances may require the school to cancel classes or programs due to insufficient enrollment or funding. The school reserves the right to make such decisions, as warranted.

For more information regarding admission requirements and policies, please contact our Admissions Office in writing, by telephone, or by Web site: Perry Technical Institute, 2011 W. Washington Ave., Yakima, WA 98903, (509) 453-0374, toll-free (888) 528-8586, or [www.perrytech.edu](http://www.perrytech.edu).

### Clock Hour/Credit Hour Conversion System

#### Quarters

- 10 Hours of Lecture = 1 Credit
- 20 Hours of Lab = 1 Credit
- 30 Hours of Externship = 1 Credit



## Trimesters

15 Hours of Lecture = 1 Credit  
30 Hours of Lab = 1 Credit  
45 Hours of Externship = 1 Credit

For Financial Aid and Veterans Affairs purposes, the above conversion factors do not apply.

## Course Identification System

Courses have titles represented by letters and numbers. The first two letters refer to the program, and the first number of the following three numbers represents the term.

Example 1: EL – Electrical Technology  
104 – 1st trimester

Example 2: GA – Graphic Technology  
307 – 3rd quarter

## Lettering System

AU	Automotive Technology
CE	Continuing Education
EL	Electrical Technology
GA	Graphic Technology
IN	Instrumentation & Industrial Automation Technology
ITC	Information Technology & Communication Systems
MA	Machine Technology
MOA	Computer Applications & Medical Office Administration
OA	Computer Applications & Office Administration
RE	Heating, Ventilation, Air Conditioning & Refrigeration Technology

## Grading

The progress or grading system by which a student will be evaluated is as follows:

GRADE	GPA	GRADE	GPA
A	4.0	C	2.0
A-	3.7	C-	1.7
B+	3.3	D+	1.3
B	3.0	D	1.0
B-	2.7	D-	.7
C+	2.3	F	0
P/F	Pass/Fail		
I	Incomplete		
W	Withdraw		
WP	Withdraw/Pass		
WF	Withdraw/Fail		
CT	Challenge test		

An incomplete grade will revert to a failing grade if it is not completed by the end of the term. Only in the case of a leave of absence will an incomplete be carried into the next term.

Students are given a grade (progress report) upon completion of each term. A copy is sent to the student's counselor (if applicable) and the documentation is maintained in the school's database.

## Make-up Work

Make-up work will be available to the student at the discretion of the program instructor.

## Graduation Requirements

1. Completion of:
  - 89.2 credit hours for Automotive Technology, 85.3 with externship option
  - 97.8 credit hours for Computer Applications & Medical Office Administration, 93.3 with externship option
  - 97 credit hours for Computer Applications & Office Administration, 93 with externship option
  - 165.5 credit hours for Electrical Technology, 157.5 with externship option
  - 130.8 credit hours for Graphic Technology, 119.6 with externship option
  - 216 credit hours for HVAC/R Technology, 197.8 with externship option
  - 222.4 credit hours for ITCS, 206.3 with externship option
  - 138.3 credit hours for Instrumentation & Industrial Automation Technology
  - 181 credit hours for Machine Technology, 165.7 with externship option
2. Maintain satisfactory progress with a minimum grade point average of 2.0
3. Maintain satisfactory attendance record
4. Maintain proper student conduct
5. Full payment or satisfactory arrangement to fulfill all financial obligations

## Certificate of Completion

Each student satisfactorily completing a course of training is granted a Certificate of Completion.

## Enrollment Capacity

Automotive Technology	32
Electrical Technology	132
Graphic Technology	60
HVAC/R Technology	88
ITCS	96
Instrumentation Technology	132
Machine Technology	40
Medical Office Administration	24
Office Administration	24

## Re-enrollment to Perry Technical Institute

Students intending to re-enroll after withdrawing or being dismissed from Perry Technical Institute are required to complete a Re-Enrollment Form that may be obtained from the Registrar.

The form will be reviewed by the specified school officials, their responses noted and signed.

The student must write a letter addressed to the Dean of Education which clearly states the following:

1. The reason for termination
2. The actions taken during the termination period to resolve the problem
3. His/her plan to successfully complete the program

## Transcripts

Upon graduation, a graduate will receive an official transcript. Fees are assessed for additional transcripts. Official transcripts are \$10 and unofficial transcripts are \$3.

## Student Services

### First Aid/CPR Training

Students are required to have a two-year first aid/CPR certification. Perry Technical Institute offers first aid/CPR classes on campus. The company providing the certification charges the student a fee for this service.

### Housing

The school does not provide housing for students. Subject to availability, dorm accommodations are available on the Yakima Valley Community College for eligible students. Information on rental units and dorm accommodations may be obtained from Perry's Admissions Office.

### Job Placement

The school does not guarantee placement upon completion of a training program. A placement book is available in the Business Office for review. Each department will assist students with:

1. Resume preparation
2. Mock interviews
3. Locating classified ads
4. Company interviews on campus

### Student Accident Insurance

Perry Technical Institute requires each enrolled student to participate in the school's Student Accident Insurance. The Student Accident Insurance is mandatory and will be applied to the student's account each term for a fee. Information about Student Accident Insurance and claim forms are available through the Registrar.

## Tutoring

The school provides academic tutoring at the discretion of the instructor in order to ensure the student's satisfactory progress through the program. Students on academic probation may be required to attend mandatory tutoring.

## Financial Aid

Perry Technical Institute offers a variety of financial assistance to eligible students. Aid in the form of grants, loans, jobs and scholarships help offset the cost of educational expenses.

Financial aid is administered in accordance with established state and federal policies and philosophies. The basis of these policies is the belief that financing a student's education is the responsibility of the student and family.

### Eligibility

A student's financial aid award is based on a demonstrated financial need. Need is determined from analysis of the Free Application for Student Aid Form and the Perry Technical Institute Data Sheet. These forms are analyzed to determine the expected contribution from the student and the student's family toward the educational expenses. Financial need is the difference between total educational expenses for an academic year and the student/family contribution. Financial aid should be viewed as a supplement only after the full resources of the student and family are committed.

### Satisfactory Academic Progress

**Definition:** Students must be making Satisfactory Academic Progress in order to remain eligible for financial aid. Students must complete each term with a minimum GPA of 2.0.

If at the end of the enrollment period, the student is not making satisfactory academic progress, financial aid funds will be terminated. The student will be responsible for funding the next enrollment period and if upon completion of that period the student has the minimum GPA of 2.0 he/she may regain financial aid eligibility.

If, due to extenuating circumstances, the student fails to meet satisfactory academic progress requirements, he or she may appeal the termination of his or her financial aid. Appeals are completed on the Financial Aid General Appeal Form. Based upon its own review of a student's circumstances, the Financial Services Office may make allowable exceptions to the stated satisfactory progress requirements. All such waivers will be reviewed on an individual basis and will take into consideration special circumstances and improved academic performance.

**Reinstatement of Aid:** Students' financial aid may be reinstated in one of two ways:

1. By completing the Financial Aid General Appeal Form.
2. By remaining in school and re-establishing compliance with the minimum cumulative GPA and attendance standards.

### **State Need Grant (SNG) Requirements:**

1. A student who has been on probation who fails to make satisfactory academic progress at the end of the term will have his/her SNG terminated. If a student wishes to appeal this decision, see Reinstatement of Aid.
2. Eligibility for SNG will be monitored every term.
3. If a student withdraws and his/her last date of attendance is prior to or at 50% of the term, the SNG repayment will be based on the percent of the term not completed.

### **Withdrawals (Refunds)**

Up through the 60% point in each payment period or period of enrollment, a pro-rata schedule is used to determine how much SFA Program funds the student has earned at the time of withdrawal. After the 60% point in the payment period or period of enrollment, a student has earned 100% of the SFA Program funds.

The amount of financial aid earned is the percentage of aid earned multiplied by the total amount of aid that was disbursed for the payment period or period of enrollment as of the day the student withdrew.

1. If the day the student withdrew occurs on or before the student completed 60% of the payment period or period of enrollment for which the assistance was awarded, the percentage earned is equal to the percentage of the payment period for which assistance was awarded that was completed.
2. If the day the student withdrew occurs after the student has completed 60% of the payment period or period of enrollment, the percentage earned is 100%.

The percentage of the payment period or period of enrollment completed is determined by calculating the total number of calendar days in the payment period divided into the number of calendar days completed in that period as of the day the student withdrew.

### **Funds will be returned in the following order:**

1. Unsubsidized Federal Stafford Loans
2. Subsidized Federal Stafford Loans
3. Perkins Loans
4. Federal/Direct Plus Loans
5. Federal Pell Grants
6. Federal Supplemental Educational Opportunity Grant
7. Washington State Need Grant
8. Washington State Opportunity Grant

### **Veteran Education Benefits**

Perry Technical Institute is approved for training for the following veterans:

Chapter 30 (Montgomery GI Bill – Active Duty Education Assistance Program)

Chapter 31 (Disabled – Vocational Rehabilitation)

Chapter 35 (Survivors and Dependents Education Assistance Program)

Chapter 1606 (Montgomery GI Bill – Selected Reserve Education Assistance Program)

Chapter 1607 (Montgomery GI Bill – Reserve Education Assistance Program)

To apply for benefits, you may obtain an application at Perry Technical Institute or your local VA office. Return completed application to PTI along with a certified copy of your DD214 form. You must also provide copies of transcripts from any other colleges that you have attended. The Veterans Certifying Official will forward applications to the Department of Veterans Affairs.

### **Military Active Duty Policy**

#### **Academic Standing and Re-enrollment:**

1. A student leaving for active duty during an academic term will receive an Incomplete.
2. The student should request to resume academic work within six months of returning from active duty.
3. The school will place the student in the earliest possible enrollment period.
4. Upon returning and finishing the academic work for the class section, the Incomplete will be removed and a final grade for that section will be given.

#### **Refund Policy for Active Duty:**

1. Refunds will be processed in accordance with the Title IV refund policy when applicable.
2. Upon returning, Military Active Duty students will receive a waiver equal to the amount of prior tuition unless Financial Aid funds were used to pay for that portion.

### **Perry Technical Foundation Scholarships**

In 1992, a group of community volunteers pledged their commitment to Perry Technical Institute by forming Perry Technical Foundation. The foundation's mission is to raise funds for student scholarships, loans, instructional equipment and capital improvements which enrich learning on the Perry campus.

The demand for technical training is rising, but so are the costs. The average total cost of completing a two-year training program at Perry is over \$24,000 and approximately 83% of our students apply for some form of financial aid. While some students qualify for state and federal assistance, Perry receives no direct funding from government agencies or from community campaigns such as United Way.

Perry Technical Foundation helps Perry Tech students by seeking support from alumni, community members, foundations and corporations. These gifts enable the foundation to offer scholarships to deserving students working toward their career goals. We believe our partnership with the community is essential to fulfilling our mission of providing technical training within the community to provide the nation with a qualified workforce.

## Trimester Tuition Schedule

### Electrical and Instrumentation

Summer Trimester – June 23, 2008	\$3,295.00
Fall Trimester – October 27, 2008	\$3,295.00
Spring Trimester – March 2, 2009	\$3,295.00
Summer Trimester - June 23, 2009	\$3,460.00
Fall Trimester - October 26, 2009	\$3,460.00

Additional Costs (estimates):	Electrical	Instrumentation
Books and Tools	\$3,500.00	\$3,500.00
Field Trips	650.00	750.00
First Aid/CPR Class	22.00	22.00
Student Accident Insurance (per term)	26.00	26.00
Technology Fee (per term)	20.00	20.00
Lab Fee (per term)	60.00	
Electrical Training Certificate	35.00	
ISA Student Membership Dues		20.00

## Quarter Tuition Schedule

### Automotive, Medical Office Administration, Office Administration, Graphics, HVAC/R, ITCS and Machine

Summer Quarter – June 23, 2008	\$2,471.25
Fall Quarter – September 29, 2008	\$2,471.25
Winter Quarter – January 5, 2009	\$2,471.25
Spring Quarter – April 6, 2009	\$2,471.25
Summer Quarter – June 24, 2009	\$2,595.00
Fall Quarter – September 28, 2009	\$2,595.00

Additional Costs (estimates):	Auto	MOA	OA	Graphics	HVAC/R	ITCS	Machine
Books and Tools	\$4,000.00	\$2,365.00	\$2,625.00	\$3,470.00	\$1,970.00	\$3,900.00	\$3,375.00
Field Trips	150.00	100.00	100.00	100.00		750.00	300.00
First Aid/CPR Class	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Student Accident Insurance (per term)	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Technology Fee (per term)	15.00	15.00	15.00	15.00	15.00	15.00	15.00
Protective Clothing Rental (per term)	25.00						
Lab Fee (per term)		30.00	30.00	45.00	40.00		45.00
ITCS Student Membership Dues						25.00	
FCC License Exam						70.00	
Access Certification Exam		74.52	74.52				
Excel Certification Exam		74.52	74.52				
Powerpoint Certification Exam		74.52	74.52				
Word Certification Exam		74.52	74.52				

\*The State of Washington does not allow for tax-exemption of items purchased for use in the State of Washington such as books and tools for instruction received in the State of Washington.

## Tuition and Fees

### Tuition Payment Requirements

Students pay tuition on a quarterly or trimester basis. Tuition is due at the start of each program quarter or trimester. Students with a balance owing will not be allowed to continue into the next enrollment period. There is an optional Tuition Payment Plan (TPP) available which may be subject to a fee and late charges.

### Refund Policy

In accordance with federal and state regulations, Perry Technical Institute provides fair and equitable adjustment to all students. If the student is entitled to a refund, the refund must be paid within 30 calendar days of the student's official date of termination.

1. An applicant to the school who is rejected will receive a full refund.
2. An applicant whose class is cancelled will receive a full refund.
3. All monies paid by an applicant will be refunded if the applicant cancels within five business days (except Sundays and holidays) following the date the contract is signed or an initial payment is made, as long as the applicant has not begun training.
4. If the applicant cancels after the fifth business day after signing the contract or making initial payment, but prior to attending class, the school will retain the \$35 registration fee and refund any other monies paid by the applicant.
5. A student who has not visited the school facility prior to enrollment will have the opportunity to withdraw within three days following either attendance at a regularly scheduled orientation or following a tour of the school facilities and inspection of equipment with a full refund.
6. The school reserves the right to cancel a class start date due to insufficient enrollment. If this occurs, the student may request a full refund of all monies paid or apply all monies paid to the next scheduled class start date.

When calculating refunds, the official date of a student's termination is the last date of recorded attendance:

1. When notification of withdrawal or cancellation is received in writing on an official Perry Technical Institute Termination of Enrollment Form
2. When the student is dismissed for a violation of a published school policy which provides for dismissal
3. When the student, without notice, fails to attend class for 30 calendar days

The term "period of enrollment for which the student has been charged" is determined by dividing the total number of days that make up the period of enrollment for which the student has been charged into the number of days remaining in that period. Termination date for adjustment computation is the last recorded date of student attendance.

The following schedule is used to calculate refunds:

If the student completes this amount of training:	School refunds to student:
Through the first 10%	90%
10% through 25%	75%
25% through 50%	50%
More than 50%	0%

Any student receiving federal or state financial aid who officially or unofficially withdraws from Perry Technical Institute will have funds returned to the appropriate financial aid program based on the regulations governing the program.

There is no refund for books purchased.

### Returned Check Processing Fee

A charge of \$27 is assessed each time a student's check is returned by a bank withholding payment.

## General Information

### Program Advisory Committees

Each program at Perry Technical Institute maintains an independent Advisory Committee that meets two times per year to review the established curriculum and comment as to the appropriateness and adequacy of the program objectives, program length, curriculum content, learning resources, facilities and equipment, student graduation, and graduate employment. The majority of the members of each Program Advisory Committee are employers representing the major occupation or occupations for which training is provided. Departments with student associations may also include student members as well as instructional staff.

### Articulation Agreement with Yakima Valley Community College

A collaborated program between Perry Technical Institute and Yakima Valley Community College provides students with the opportunity to earn an Associate of Applied Science in six technical areas\*. Upon acceptance into a designated Perry Technical Institute program, students may begin taking required classes at Yakima Valley Community College. This can be done while waiting for entrance in the technical portion of their degree, while they complete the technical portion or after they completed their technical portion.

An Associate of Applied Science along with the technical program allows students to work more effectively in their chosen field and to help them compete for advanced opportunities in their chosen field. An official referral from Perry Technical Institute is required for students enrolling under terms of this agreement.

In addition to completing their technical program at Perry Technical Institute, students complete 27 to 32 credits at Yakima Valley Community College. Credits are designated as core requirements and are required for all programs. For additional information, please contact the Workforce Education Division at Yakima Valley Community College at (509) 574-4744 or (509) 574-4796 ([www.yvcc.edu](http://www.yvcc.edu)) or Perry Technical Institute at (509) 453-0374.

\*Automotive Technology, Computer Applications & Office Administration, and Computer Applications and Medical Office Administration do not have articulation agreements with Yakima Valley Community College.

## Comparable Programs

Information about comparable programs, tuition, and length of programs may be obtained by contacting:

Accrediting Commission of Career Schools  
and Colleges of Technology  
2101 Wilson Boulevard, Suite 302  
Arlington, VA 22201  
Telephone: (703) 247-4212

## Student Complaint/Grievance Procedure

Perry Technical Institute utilizes policies and procedures for handling student complaints and informs the students in writing of them. When a student has a complaint, he/she is encouraged to follow the chain of command and communicate informally first with the instructor, then the department head and then the Dean of Education. If the student is still unsatisfied, he/she is asked to file a PTI written complaint form at the Registrar's Office and then encouraged to make an appointment with the President for further discussion and action.

A student may consider contacting the Workforce Training and Education Coordinating Board. Contact information for the Workforce Training and Education Coordinating Board is as follows:

Workforce Training and Education Coordinating Board  
PO Box 43105  
Olympia, WA 98504-3105  
Telephone (360) 753-5673.

More information can be obtained by referencing RCW's Title 28C > Chapter 28C.10 or 28C.10.084(10) and 28C.10.120 or WACs > Title 490 > Chapter 490-105 > Section 490-105-180

If a student does not feel that the school has adequately addressed a complaint or concern, the student may consider contacting the Accrediting Commission. All complaints considered by the commission must be in written form, with permission from the complainant(s) for the commission to forward a copy of the complaint to the school for a response. The complainant(s) will be kept informed as to the status of the complaint as well as the final resolution by the commission. Please direct all inquiries to:

Accrediting Commission of Career Schools and  
Colleges of Technology  
2101 Wilson Blvd Suite 302  
Arlington, VA 22201  
(703) 247-4212

A copy of the Commission's Complaint Form is available at the school, and may be obtained by contacting the Registrar.

## Conduct Standards

Admission to Perry Technical Institute carries with it the expectation that students will conduct themselves as responsible members of the school community, that they will comply with the rules and regulations of the institution, maintain high standards of integrity and honesty, respect the rights, privileges, and property of other members of the school community, and will not interfere with legitimate Perry Technical Institute affairs.

Perry Technical Institute maintains the right to make and enforce rules for conduct. This includes the right to dismiss at any time a student whose conduct, academic standing, or health is such that the Administration believes it undesirable for that student to continue at Perry Technical Institute.

A student policy handbook is provided to all new students the first day of class. The booklet provides a complete statement of the policies and procedures and describes student rights and responsibilities which govern students attending Perry Technical Institute, including any disputes involving the school, its faculty or staff and the student.

## Drug Free Environment Policy

As a matter of policy, Perry Technical Institute prohibits the unlawful manufacture, possession, use, sale, dispensation, or distribution of controlled substances and the possession or use of alcohol by students and employees on its property and at any school-related activity. Further information on Perry Technical Institute's policies can be found in the Student Handbook. Any violation of these policies will result in appropriate disciplinary actions up to and including dismissal, even for a first offense. Students with "Reasonable Suspicion" may be required to be tested for illegal drug or alcohol abuse. Refusal to do so may result in dismissal from the school.

Violations of the law will also be referred to the appropriate law enforcement authorities. Students may be referred to abuse help centers. If such a referral is made, a leave of absence may be required, and re-enrollment will be subject to successful completion of any prescribed counseling or treatment program.

## Unlawful Harassment Policy

All members of Perry Technical Institute's community, including, the faculty, students, and staff, have the right to be free from sexual harassment by any other member of Perry Technical Institute's community. Should a student feel that he/she has been harassed, the student should immediately inform the Dean of Education and/or the President.

Sexual harassment refers to, among other things, sexual conduct that is unwelcome, offensive, or undesirable to the recipient, including unwanted sexual advances.

All students and employees must be allowed to work and study in an environment free from unsolicited and unwelcome sexual overtures and advances. Unlawful sexual harassment will not be tolerated.

## Leave of Absence

A leave of absence is granted only to students who wish temporarily to interrupt their education for the following reasons: medical emergency, military leave, or other family crisis. A leave of absence will not be granted for failure to make satisfactory academic progress.

A request for leave must be made to the Dean of Education, in writing prior to absence, excluding emergencies, or time away from school will be considered an unexcused absence. The written request to the Dean of Education must include a third-party verification of the reason for the leave of absence. Upon approval by the Dean of Education, a Leave of Absence Form must be completed and submitted to the Registrar's Office. The Department of Veterans Affairs and the Financial Aid Office will be notified immediately when the student is granted a leave of absence. A leave of absence will be a maximum of 30 days.

## Liability

Perry Technical Institute is not responsible for loss or damage to personal property or for personal injury occurring while on the school grounds or on field trips.

## Non-Discrimination Policy

Perry Technical Institute does not discriminate on the basis of race, color, national origin, sex, disability, or age in our programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies:

Registrar  
Perry Technical Institute  
2011 W. Washington Ave.  
Yakima, WA 98903  
(509) 453-0374 or (888) 528-8586

Seattle Office  
Office for Civil Rights  
U.S. Department of Education  
915 Second Ave. Room 3310  
Seattle, WA 98174-1099

Telephone: 206-220-7900  
FAX: (206) 220-7887; TDD: (877) 521-2172  
Email: [OCR.Seattle@ed.gov](mailto:OCR.Seattle@ed.gov)

## Student Records

Students have the right to review, inspect or release their confidential education records. A student requesting to review their education records shall make the request in writing to the PTI Registrar. The Registrar must be presented with proper identification which may include the student's identification card or a driver's license containing a picture of the student.

Perry Technical Institute maintains a permanent educational record for all currently enrolled students that consists of all admissions, academic, and financial records and information upon which a student's enrollment is based. These records (physical or electronic) must be securely maintained and protected against damage or loss (e.g., fire, water, theft, tampering, etc.).

Perry Technical Institute maintains an official transcript for all formerly enrolled students (i.e., graduates and terminated or withdrawn students). The transcript includes, at a minimum, the program of study; the date of program entry; the date of graduation, termination or withdrawal; and the clock or credit hours and grades earned. An official transcript is available to students upon request and in accordance with the school's policies. The transcripts (physical or electronic) are securely maintained indefinitely and protected against damage or loss (e.g., fire, water, theft, tampering, etc.).

Perry Technical Institute maintains student financial records related to financial aid, tuition and fee payments, and tuition refunds for a minimum of five years. (State or federal regulation or law may require these records to be maintained for a longer period of time.)

## Changes

This catalog is current as of the date of publication. Perry Technical Institute reserves the right to make changes at any time to any provision of this catalog, including the amount of tuition and fees; academic programs and courses; Perry Technical Institute policies and procedures; faculty and administrative staff; academic calendar; and other dates and provisions. Perry Technical Institute also reserves the right to make changes in equipment and instructional materials, to modify curriculum and, when size and curriculum permit, to combine classes.

From time to time, it may be necessary or desirable for Perry Technical Institute to make changes to this catalog due to the requirements and standards of Perry Technical Institute's accrediting body, state authorization agency or the United States Department of Education, or due to the market conditions, employer needs or for other reasons.

To see the most current version of the catalog, please visit our Web site at [www.perrytech.edu](http://www.perrytech.edu).

## Automotive Technology

The 12-month Automotive Technology Program is evaluated by the National Automotive Technicians Education Foundation (NATEF) and certified as a National Institute for Automotive Service Excellence (ASE) Master Training Program.

Prospective students must have a valid driver's license. A good driving record is recommended for job placement. Automotive Technology students are required to wear shop coveralls from a local vending service which will be provided by the school. Students will be assessed a quarterly fee for cleaning and repairing. Prior to graduation, students will be responsible for turning in or purchasing the coveralls.

Shop training will occur on the Perry campus or in a dealer service department, independent garage or other approved training site. Students interested in externships must make arrangements with the department chairperson and are required to have a 3.0 GPA and maintain this grade during their externship.

Students are eligible to begin an externship after completing eight months of the Automotive Program. Externships are also dependent on a satisfactory host site that will provide the job skills training to enhance skills and concepts taught in the Automotive Technology Program. Students will spend one full week at the externship site, the second week they are required to spend the morning in class at Perry Technical Institute and return to their externship site in the afternoon. In the event no externship position exists, students will complete their shop training on campus.

In the Automotive Technology Program, a student must achieve a minimum quarterly GPA of 2.0 in the academic subject material and a 2.0 GPA in lab to maintain satisfactory progress.

Rewarding employment opportunities in the automotive field are numerous and varied throughout the Northwest. The goal for students who successfully complete the course is employment as entry-level technicians in the automotive industry.

The Automotive Technology Program is 12 months in length. The student will earn 89.2 credit hours or 85.3 credit hours (externship option) which are 1,344 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours	
Quarter 1	AU 101E	Externship option after eight months. . . . .	236	7.9	
		Or the following lab: AU 101L			
	AU 101	Electrical Systems. . . . .	100	10.0	
	AU 101L	Electrical Systems Lab . . . . .	<u>236</u>	<u>11.8</u>	
		Without Externship . . . . .	336	21.8	
		With the Externship. . . . .	336	17.9	
Quarter 2	AU201E	Externship option after eight months. . . . .	236	7.9	
		Or the following labs: AU 201L and AU 202L			
	AU 201	Engine Performance & Emissions. . . . .	80	8.0	
	AU 201L	Engine Performance & Emissions Lab . . . . .	176	8.8	
	AU 202	Heating and Air Conditioning. . . . .	20	2.0	
	AU 202L	Heating and Air Conditioning Lab . . . . .	<u>60</u>	<u>3.0</u>	
		Without Externship . . . . .	336	21.8	
		With the Externship. . . . .	336	17.9	
Quarter 3	AU 301E	Externship option after eight months. . . . .	236	7.9	
		Or the following labs: AU 301L and AU 302L			
	AU 301	Brake Systems . . . . .	60	6.0	
	AU 301L	Brake Systems Lab. . . . .	134	6.7	
	AU 302	Suspension & Steering . . . . .	40	4.0	
	AU 302L	Suspension & Steering Lab. . . . .	<u>102</u>	<u>5.1</u>	
		Without Externship . . . . .	336	21.8	
		With the Externship. . . . .	336	17.9	
Quarter 4	AU 401E	Externship option after eight months. . . . .	196	6.5	
		Or the following labs: AU 401L, AU 402L and 403L			
	AU 401	Basic Automobile Engine . . . . .	100	10.0	
	AU 401L	Basic Automobile Engine Lab . . . . .	116	5.8	
		AU 402	Automatic Transmission & Power Train . . . . .	20	2.0



	Clock Hours	Credit Hours
AU 402L Automatic Transmission & Power Train Lab . . . . .	40	2.0
AU 403 Manual Transmission & Power Train. . . . .	20	2.0
AU 403L Manual Transmission & Power Train Lab . . . . .	40	2.0
Without Externship . . . . .	336	23.8
With the Externship. . . . .	336	20.5
Program Totals without Externship Option . . . . .	1344	89.2
Program Totals with Externship Option. . . . .	1344	85.3

## Automotive Technology Course Descriptions

### **AU 101E Externship**

Practical experience in a workplace environment.

alignment; adjustment and repair; and wheel and tire diagnosis and repair.

### **AU 101 Electrical Systems**

General electrical systems diagnosis; battery diagnosis and service; starter systems diagnosis and repair; charging systems diagnosis and repair; lighting systems diagnosis and repair; gauges and warning systems diagnosis and repair; and accessory systems diagnosis and repair.

### **AU 302L Suspension & Steering Lab**

Hands-on application of classroom instruction.

### **AU 401E Externship**

Practical experience in a workplace environment.

### **AU 101L Electrical Systems Lab**

Hands-on application of classroom instruction.

### **AU 401 Basic Automobile Engine**

Engine theory and operation; engine maintenance; valve train diagnosis and repair; engine block diagnosis and repair; and engine reassembly and installation.

### **AU 201E Externship**

Practical experience in a workplace environment.

### **AU 401L Basic Automobile Engine Lab**

Hands-on application of classroom instruction.

### **AU 201 Engine Performance & Emissions**

General engine diagnosis; ignition systems diagnosis and repair; fuel, air induction and exhaust systems diagnosis and repair; emission systems and computer engine control systems diagnosis and repair; and engine performance related services.

### **AU 402 Automatic Transmission & Powertrain**

Automatic transmission theory and operation; drive-line, axle and half-shaft diagnosis and repair; and differential diagnosis and repair.

### **AU 201L Engine Performance & Emissions Lab**

Hands-on application of classroom instruction.

### **AU 402L Automatic Transmission & Powertrain Lab**

Hands-on application of classroom instruction.

### **AU 202 Heating & Air Conditioning**

Refrigerant handling and recovery procedures and certification; heating systems; refrigerant retrofitting; and control and operating systems diagnosis and repair.

### **AU 403 Manual Transmission & Powertrain**

Manual transmission theory and operation; drive-line, axle and half-shaft diagnosis and repair; and differential diagnosis and repair.

### **AU 202L Heating & Air Conditioning Lab**

Hands-on application of classroom instruction.

### **AU 403L Manual Transmissions & Powertrain Lab**

Hands-on application of classroom instruction.

## Automotive Technology Book and Tool List

### **AU 301E Externship**

Practical experience in a workplace environment.

The book and tool list for students in the Automotive Technology Program is intended to be a minimum requirement to complete the program.

### **AU 301 Brake Systems**

Hydraulic brake system; drum brake systems diagnosis and repair; disc brake systems diagnosis and repair; anti-lock brake system diagnosis and repair; and miscellaneous systems diagnosis and repair.

## Book List

### **AU 301L Brake Systems Lab**

Hands-on application of classroom instruction.

**The book cost for the Automotive Technology Program is approximately \$130.** Books may be purchased on the start date. Changes may be made as more appropriate material is developed or new editions are published. Book prices may vary. The prices stated do not include any mark-up for program students or any sales taxes.

### **AU 302 Suspension & Steering**

Suspension and steering systems diagnosis and repair; wheel

**Required Book:**

Automotive Technology, Fourth Edition, Jack Erjavec, 2005

**Optional Book:**

Automotive Tech Certification, Don Knowles, 2001

**Tool List**

**The estimated cost of tools for the Automotive Technology Program is \$3,234-\$3,870 depending on the brand purchased.** During the first week of class, new students will meet with tool vendors to purchase tools. Tool prices may vary. The prices stated do not include any mark-up for program students or any sales taxes. Tool list may vary according to industry requirements.

Antifreeze tester

Allen wrenches, standard (.050"-3/8") metric (1.5mm-7mm)

Adjustable wrenches - 8" & 12"

Air nipples (5)

Battery tools

Battery nut pliers

Battery terminal clamp puller

Post cleaner, top & side

Blow gun-rubber tip, OSHA approved

Brake tools

Spring pliers

Hold-down tool

Adjustable spoon

Bleeder cup

Chisel & punch set, including:

Tapered punches

Pin punches

Brass drift punch

Cold chisel

Cape chisel

Combination wrenches

Standard – 1/4" -1"

Metric – 7mm -19mm

Compression tester

Creeper

Digital multi-meter

Dial caliper/w 6" ruler

Drop-light – OSHA approved

Drill – 3/8" – air with adapter

Drill bits – 29 piece, reduced shank, 1/16-1/2

Feeler gauges (2) - Straight and Angled

Fender covers (2)

File set, three piece, 6" Flat, Round & Triangle

Filter wrenches – oil, 3 1/2", & 2 7/8"

Flare nut wrenches – 3/8"-11/16", 3/4"-7/8" (10mm-17mm)

Flashlight with batteries

Hack saw with blades

Hammers

16oz. ball peen

48-60 oz. hand sledge

Dead blow

Air impact ratchet – 1/2" drive, including adapter, with sockets – 1/2"-1 1/8"

Air impact ratchet – 3/8" drive, including adapter

Inspection mirror

Magnetic pickup tool

Micrometer 0-1"

Pliers

Wire crimping

Needle nose

6" slip joint

6" diagonal cutter

8" locking pliers

10" or 12" adjustable water pump

Pry bar – 16"

Puller set- harmonic balancer

Remote starter switch

Safety glasses

Scraper – gasket

Screwdrivers

Slot – stubby, #1, #2, #3

Phillips – stubby, #1, #2, #3

Torx set 3/8" drive – 1/4"-3/8" drive bits and T10-T50

Snap ring plier set – long, med, & small: Truarc & regular

Socket set – 1/4" drive

Standard shallow 1/4"-9/16"

Standard deep 3/16"-9/16"

Metric shallow 4mm-15mm

Metric deep 6mm-15mm

Ratchet

Extension: 2" long, 6" long

Screwdriver handle

Adapter – 1/4" -3/8"

Universal joint – 1/4" drive

Socket set – 3/8" drive

1/4"-7/8" standard shallow

3/8"-7/8" standard deep

6mm-19mm metric shallow

10mm-19mm metric deep

Flex sockets – 3/8" -3/4" (10mm-19mm)

Ratchet

Extensions (4) – short, med, long 24"

Spark plug sockets, 5/8" & 13/16" universal joint

Adapter – 3/8"- 1/2"

Universal joint, 3/8" drive

Socket set – 1/2" drive

Adapters – 1/2" -3/8", 1/2" -3/4"

7/16" -1 1/4" standard shallow

1/2" -1 1/4" standard deep

10mm-24mm metric shallow

Ratchet

Extensions (3) – 2", 5" & 10".

Universal joint – 1/2" drive

Solder gun – 250 watt or greater

Spark plug gap gauge

Spark plug wire remover

Spark tester (in-line)

Steel tape measure – 12'

Stethoscope

Test light – 12 volt

Timing light – induct. pickup

Tire air check, with adapter

Tire pressure gauge

Tire valve core tool

Torque wrench – 1/2" drive, 25-250 ft./lb.

Torque wrench – 3/8" drive, 25-250 in./lb.

Vacuum pump (hand operated)

Wire brush

Rollaway tool box with or without top box adequate to hold required tools with reasonable room for expansion

## Computer Applications & Medical Office Administration

The goal of the Computer Applications & Medical Office Administration Program is to prepare graduates for entry-level positions in the growing field of health care office professionals. These are rewarding careers that not only have good advancement potential but allow graduates to do the kind of work that helps other people.

Graduates of this program will be prepared for positions such as: medical office assistant, medical coder, medical office computer specialist, receptionist, and other support positions in medical offices, hospitals and other health care organizations. This program also prepares graduates to take the Microsoft Certified Application Specialist (MCAS) exams in Word, Excel, Access and PowerPoint; and the National Certification for Medical Office Assistants (NCMOA) exam.

This four-quarter program incorporates in-depth computer training and the basics of working in a health care office.

The first two quarters prepare students to take Microsoft Office Application Specialist (MCAS) certification exams in Microsoft Word, Excel, Access and PowerPoint. By the end of the first two quarters, students will be able to demonstrate a solid understanding of computers including entry-level keyboarding operations and basic maintenance. They will develop an understanding of how to use the Windows operating system and various software applications. They will also learn the importance of career planning and how to develop a positive customer service environment.

In the second two quarters, students learn the basics of working in a medical office setting. Subjects include: Medical Terminology, Anatomy and Physiology, Medical Office Procedures, Basic Diagnostic and Procedures Coding, and Human Diseases. The goal for quarter three and four is for students to be prepared to take the National Certification for Medical Office Assistants (NCMOA) exam. Students will also learn valuable career planning and business communications skills for the medical industry.

Students will learn advanced career planning practices and demonstrate skills and competencies in externship assignments by electing an externship option pending instructor approval. Students must have a "B" or better in current coursework, must not be under any type of probationary contract, and must complete and submit a regular lab work experience employer evaluation. The instructor may terminate industry work experiences at any time if students do not adhere to these requirements.

The Computer Applications & Medical Office Administration Program is 12 months in length. The student will earn 97.8 credit hours or credit hours 93.3 (externship option) which are 1,344 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	OA 101	Computer Applications I . . . . .	30	3.0
	OA 101L	Computer Applications I Lab . . . . .	30	1.5
	OA 105	Business English I . . . . .	30	3.0
	OA 105L	Business English I Lab . . . . .	30	1.5
	OA 110	Keyboarding I . . . . .	15	1.5
	OA 110L	Keyboarding I Lab . . . . .	20	1.0
	OA 115	Word Processing . . . . .	30	3.0
	OA 115L	Word Processing Lab . . . . .	30	1.5
	OA 120	Spreadsheets . . . . .	30	3.0
	OA 120L	Spreadsheets Lab . . . . .	30	1.5
	OA 130	Database . . . . .	30	3.0
	OA 130L	Database Lab . . . . .	<u>31</u>	<u>1.6</u>
			336	25.1
Quarter 2	OA 201	Business English II . . . . .	30	3.0
	OA 201L	Business English II Lab . . . . .	30	1.5
	OA 205	Computer Applications II . . . . .	45	4.5
	OA 205L	Computer Applications II Lab . . . . .	50	2.5
	OA 210	Keyboarding II . . . . .	15	1.5
	OA 210L	Keyboarding II Lab . . . . .	20	1.0
	OA 215	Business Presentation . . . . .	35	3.5
	OA 215L	Business Presentation Lab . . . . .	40	2.0
	OA 220	Career Planning I . . . . .	20	2.0
	OA 220L	Career Planning I Lab . . . . .	10	.5
	OA 230	Business Etiquette . . . . .	20	2.0
	OA 230L	Business Etiquette Lab . . . . .	<u>21</u>	<u>1.1</u>
			336	25.1
Quarter 3	MOA 300E	Externship option . . . . . Or the following labs: MOA 305L, MOA 320L, and MOA 330L	76	2.5

	MOA 301	Anatomy & Physiology . . . . .	30	3.0
	MOA 301L	Anatomy & Physiology Lab . . . . .	30	1.5
	MOA 305	Health Care Law & Ethics . . . . .	30	3.0
	MOA 305L	Health Care Law & Ethics Lab . . . . .	30	1.5
	MOA 315	Medical Terminology . . . . .	35	3.5
	MOA 315L	Medical Terminology Lab . . . . .	40	2.0
	MOA 320	Medical Career Planning . . . . .	15	1.5
	MOA 320L	Medical Career Planning Lab . . . . .	20	1.0
	MOA 325	Human Diseases . . . . .	30	3.0
	MOA 325L	Human Diseases Lab . . . . .	25	1.3
	MOA 330	Computers in Health Care . . . . .	25	2.5
	MOA 330L	Computers in Health Care Lab . . . . .	<u>26</u>	<u>1.3</u>
		Without Externship . . . . .	336	25.1
		With Externship . . . . .	336	23.8
Quarter 4	MOA 401	Customer Service in the Medical Industry . . . . .	20	2.0
	MOA 401L	Customer Service in the Medical Industry Lab . . . . .	20	1.0
	MOA 405	Basic Diagnostic Coding . . . . .	25	2.5
	MOA 405L	Basic Diagnostic Coding Lab . . . . .	20	1.0
	MOA 410	Basic Procedures Coding . . . . .	25	2.5
	MOA 410L	Basic Procedures Coding Lab . . . . .	30	1.5
	MOA 415	Medical Office Procedures . . . . .	30	3.0
	MOA 415L	Medical Office Procedures Lab . . . . .	20	1.0
	MOA 430E	Externship . . . . .	146	4.9
		Or		
	MOA 435	Capstone Project . . . . .	16	1.6
	MOA 435L	Capstone Project Lab . . . . .	<u>130</u>	<u>6.5</u>
		Without Externship . . . . .	336	22.6
		With Externship . . . . .	336	19.4
		Program Totals without Externship Option . . . . .	1344	97.8
		Program Totals with Externship Option . . . . .	1344	93.3

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### Computer Applications & Medical Office Administration Course Descriptions

#### **OA 101 Computer Applications I**

This course covers the basics of computer hardware, software, networks and the internet. The objective is to prepare the student to take the IC3 certification exam.

#### **OA 101L Computer Applications I Lab**

Directed lab with structured learning.

#### **OA 105 Business English I**

A concentrated review of sentence writing, this course emphasizes sentence combining, basic mechanics and paragraph writing. Various forms of written business communication will be covered in Business English I including effective composition of letters and electronic communications.

#### **OA 105L Business English I Lab**

Directed lab with structured learning.

#### **OA 110 Keyboarding I**

In this course, students learn beginning typing and 10-key skills. The objectives are for students to learn how to type by touch and how to take a timed keyboarding test for accuracy and speed.

#### **OA 110L Keyboarding I Lab**

Directed lab with structured learning.

#### **OA 115 Word Processing**

Students learn how to use Microsoft Word for basic and advanced word processing. The objective of this course is to prepare students to take the MCAS certification exam for Word.

#### **OA 115L Word Processing Lab**

Directed lab with structured learning.

#### **OA 120 Spreadsheets**

Students learn Microsoft Excel and how to build business and financial applications for forecasting, budgeting and basic book-keeping. The objective of this course is to prepare students to take the MCAS certification exam for Excel.

#### **OA 120L Spreadsheets Lab**

Directed lab with structured learning.

#### **OA 130 Database**

Students learn how to create and use databases with Microsoft Access. The objective of this course is to prepare students to take the MCAS certification exam for Access.

#### **OA 130L Database Lab**

Directed lab with structured learning.

#### **OA 201 Business English II**

This course emphasizes basic punctuation and grammar rules and covers sentence structure. The course is designed

to introduce basic reading skills and to develop basic writing skills. Coursework emphasizes writing from observation as well as writing in response to readings. The focus is on writing sentences which demonstrate a grasp of basic syntax and usage, and writing sound paragraphs which express a main idea clearly and develop it fully with a minimum of errors in sentence structure, punctuation and spelling.

**OA 201L Business English II Lab**

Directed lab with structured learning.

**OA 205 Computer Applications II**

Students learn Microsoft Publisher to create posters, newsletters, flyers and more, covering topics such as: page layout, command frames, table frames, WordArt, background pages and much more.

**OA 205L Computer Applications II Lab**

Directed lab with structured learning.

**OA 210 Keyboarding II**

In this course students learn how to improve their accuracy and typing speed. Students also learn formatting for personal and business letters, memoranda, simple tabulation techniques, proofreading and editing. This course covers the basics of computer hardware, software, networks and the Internet. The objective is to prepare students to take the IC3 certification exam.

**OA 210L Keyboarding II Lab**

Directed lab with structured learning.

**OA 215 Business Presentation**

This course provides instruction in developing presentation materials. Students create a variety of charts, graphs and interactive presentations. Microsoft PowerPoint enables users to quickly create high-impact, dynamic presentations, while integrating workflow and ways to easily share information.

**OA 215L Business Presentation Lab**

Directed lab with structured learning.

**OA 220 Career Planning I**

This course is designed to teach students how to write a professional resume package and to learn basic interviewing skills.

**OA 220L Career Planning I Lab**

Directed lab with structured learning.

**OA 230 Business Etiquette**

This course focuses on the fundamentals of etiquette as it relates to business and business relationships inside and outside the office.

**OA 230L Business Etiquette Lab**

Directed lab with structured learning.

**MOA 300E Externship**

Students will learn advanced career planning practices and demonstrate skills and competencies in externship assignments by electing an externship option pending instructor approval. Students must have a "B" or better in current coursework, must not be under any type of probationary contract, and must complete and submit a regular lab work experience employer evalu-

ation. The instructor may terminate industry work experiences at any time if students do not adhere to these requirements.

**MOA 301 Anatomy & Physiology**

A study of the structure and function of the human body utilizing a system approach. Emphasis placed on the gross and microscopic anatomy as well as the physiology of the cell, skeletal system, muscular system, nervous system, cardiovascular, respiratory, urinary, reproductive, endocrine, digestive, lymphatic, special senses and integumentary systems.

**MOA 301L Anatomy & Physiology Lab**

Directed lab with structured learning.

**MOA 305 Health Care Law & Ethics**

This course examines the ethical challenges facing individuals and businesses in modern society. The course utilizes case studies of professionals working in various areas of business and provides guest speakers with real-world experiences.

**MOA 305L Health Care Law & Ethics Lab**

Directed lab with structured learning.

**MOA 315 Medical Terminology**

This course is designed to teach students to accurately spell, pronounce and define common medical terms related to major disease processes, diagnostic procedures, laboratory tests, abbreviations, drugs and treatment modalities.

**MOA 315L Medical Terminology Lab**

Directed lab with structured learning.

**MOA 320 Medical Career Planning**

Students learn advanced interviewing skills, how to construct a portfolio of their work and job-seeking skills. This course will guide the student through the elements of career planning, including self-understanding, and exploring a variety of medical careers paths.

**MOA 320L Medical Career Planning Lab**

Directed lab with structured learning.

**MOA 325 Human Diseases**

Emphasis placed on the disease processes affecting the human body via an integrated approach to specific disease entities, including the study of causes, diagnosis and treatment of disease.

**MOA 325L Human Diseases Lab**

Directed lab with structured learning.

**MOA 330 Computers in Health Care**

Overview of commonly available software tools used in health care, including introduction to encoding tools and computer-assisted coding software used in today's health care data processing. Introduction to the electronic health record process and medical office database management software found in American health care delivery. Prerequisites: Completion of six semester credits in software applications courses, or passing the school's computer proficiency exam.

**MOA 330L Computers in Health Care Lab**

Directed lab with structured learning.

**MOA 401 Customer Service in the Medical Industry**

This course emphasizes how to provide excellent customer service. Effective verbal communication and telephone skills are taught. Problem resolution skills and how to handle difficult situations are important elements of this course. Soft skills such as patience and empathy are stressed.

**MOA 401L Customer Service in the Medical Industry Lab**

Directed lab with structured learning.

**MOA 405 Basic Diagnostic Coding**

This course is an introduction to basic diagnostic coding and presents students to the characteristics and conventions of ICD-9-CM and ICD-10-CM (International Classification of Diseases, 9th and 10th Edition, Clinical Modification), and other diagnosis coding systems or code sets (DSM-IV, ICD-0, etc.). Focus is placed on using official coding guidelines correctly and the course includes extensive practice coding exercises.

**MOA 405L Basic Diagnostic Coding Lab**

Directed lab with structured learning.

**MOA 410 Basic Procedure Coding**

This course is an introduction to basic procedural coding and present students with the characteristics of CPT-4 (Current Procedural Terminology), HCFPCS (Health Care Financing Administration Common Procedure Coding System) Level II codes, ICD-9-CM Volume III, and ICD-10-PCS. The course focuses on correct code assignment and includes extensive practice coding exercises.

**MOA 410L Basic Procedures Coding Lab**

Directed lab with structured learning.

**MOA 415 Medical Office Procedures**

This course introduces and teaches the tasks of a medical office assistant's career: How to perform administrative functions, records management, medical communications, telephone triage, preparing patients charts, scheduling appointments, and an introduction to patient billing and processing insurance claims. Emphasis is placed on developing a working knowledge of concepts, processes and procedures in the billing cycle from point of service to receipt of payment. The course covers how to recognize components of a compliance plan for physician office billing, filing of appeals, etc. and focuses on decision making and critical thinking activities.

**MOA 415L Medical Office Procedures Lab**

Directed lab with structured learning.

**MOA 430E Externship**

Students will learn advanced career planning practices and demonstrate skills and competencies in externship assignments by electing an externship option pending instructor approval. Students must have a "B" or better in current coursework, must not be under any type of probationary contract, and must complete and submit a regular lab work experience employer evaluation. The instructor may terminate industry work experiences at any time if students do not adhere to these requirements.

**MOA 435 Capstone Project**

Students will be assigned a capstone project which will

provide an opportunity to demonstrate competency in their coursework.

**MOA 435L Capstone Project Lab**

Directed lab with structured learning.

### **Computer Applications & Medical Office Administration Book and Tool List**

The book and tool list for students in the Computer Applications & Medical Office Administration Program is intended to be a minimum requirement to complete the program.

**Tool and book costs are approximately \$2,365.** Purchase or lease your laptop computer before school begins.

**Estimated cost of a laptop computer and software is \$1,070.** Your instructor will give details on the first day of school regarding the purchase of your books and supplies. Book and tool prices may vary. The prices stated do not include mark-up for program students or any sales taxes.

#### **Book List**

**The book cost for Computer Applications & Medical Office Administration is approximately \$1,295.** Changes may be made as more appropriate material is developed or new editions are published. The book list will be provided along with your course syllabi on your first day of school.

**Optional Book:**

A Writer's Reference: 2003 MLA Update by Diana Hacker, 2003.

#### **Tool List**

Laptop computer with appropriate software  
Dictionary  
Book bag or carrying case

Students may purchase their computer through a vendor of their choice, including: Dell.com Toshiba.com Sony.com Apple.com Hp.com Gateway.com

Staples, Office Max, Best Buy and Office Depot are authorized PC dealers.

#### **Laptop Computer and Accessories. Approximate cost is \$900**

Minimum System Requirements:  
Microsoft Vista Operating System  
1 GHz 32-bit (x86) or 64-bit (x64) processor  
1 GB of system memory  
80 GB hard drive with at least 15 GB of available space  
Support for DirectX 9 graphics, or higher with:  
WDDM driver  
128 MB of graphics memory (minimum)  
Pixel shader 2.0 hardware  
32 bits per pixel

**Software Required. Approximate cost is \$170.**  
Microsoft Office Professional 2007

## Computer Applications & Office Administration

The Computer Applications & Office Administration Program is the launching pad toward an entry-level job in a variety of business and office positions such as software applications specialist, bookkeeper, office administrator, secretary and office/clerical positions. These types of positions are in constant demand and serve as the first step up the ladder to an office or business environment.

The first two quarters prepare students to take Microsoft Certified Application Specialist (MCAS) certification exams in Microsoft Word, Excel, Access and PowerPoint. By the end of the first two quarters, students will be able to demonstrate a solid understanding of computers including entry-level keyboarding operations and basic maintenance. They will develop an understanding of how to use the Windows operating system and various software applications. They will also learn the importance of career planning and how to develop a positive customer service environment.

In the second two quarters, students will advance into more specialized subjects. By the end of the second two quarters, students will be required to develop a solid understanding of entry-level desktop publishing and computerized accounting and acquire a higher level of keyboarding skills as they prepare for externships and employment opportunities.

Students will learn advanced career planning practices and demonstrate skills and competencies in externship assignments by electing an externship option pending instructor approval. Students must have a "B" or better in current coursework, must not be under any type of probationary contract, and must complete and submit a regular lab work experience employer evaluation. The instructor may terminate industry work experiences at any time if students do not adhere to these requirements.

The second two quarters prepare students to take the National Registered Bookkeeper (NRB) certification exam.

The Computer Applications & Office Administration Program is 12 months in length. The student will earn 97.0 credit hours or 93.0 credit hours (externship option) which are 1,344 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	OA 101	Computer Applications I . . . . .	30	3.0
	OA 101L	Computer Applications I Lab . . . . .	30	1.5
	OA 105	Business English I . . . . .	30	3.0
	OA 105L	Business English I Lab . . . . .	30	1.5
	OA 110	Keyboarding I . . . . .	15	1.5
	OA 110L	Keyboarding I Lab . . . . .	20	1.0
	OA 115	Word Processing . . . . .	30	3.0
	OA 115L	Word Processing Lab . . . . .	30	1.5
	OA 120	Spreadsheets . . . . .	30	3.0
	OA 120L	Spreadsheets Lab . . . . .	30	1.5
	OA 130	Database . . . . .	30	3.0
	OA 130L	Database Lab . . . . .	<u>31</u>	<u>1.6</u>
			336	25.1
Quarter 2	OA 201	Business English II . . . . .	30	3.0
	OA 201L	Business English II Lab . . . . .	30	1.5
	OA 205	Computer Applications II . . . . .	45	4.5
	OA 205L	Computer Applications II Lab . . . . .	50	2.5
	OA 210	Keyboarding II . . . . .	15	1.5
	OA 210L	Keyboarding II Lab . . . . .	20	1.0
	OA 215	Business Presentation . . . . .	35	3.5
	OA 215L	Business Presentation Lab . . . . .	40	2.0
	OA 220	Career Planning I . . . . .	20	2.0
	OA 220L	Career Planning I Lab . . . . .	10	.5
	OA 230	Business Etiquette . . . . .	20	2.0
	OA 230L	Business Etiquette Lab . . . . .	<u>21</u>	<u>1.1</u>
			336	25.1

			Clock Hours	Credit Hours
Quarter 3	OA 300E	Externship option . . . . .	86	2.9
		Or the following labs: OA 305L, OA 325L and OA 330L		
	OA 301	Business English III . . . . .	30	3.0
	OA 301L	Business English III Lab . . . . .	30	1.5
	OA 305	Business Ethics . . . . .	30	3.0
	OA 305L	Business Ethics Lab . . . . .	30	1.5
	OA 315	Financial Accounting . . . . .	35	3.5
	OA 315L	Financial Accounting Lab . . . . .	40	2.0
	OA 320	Career Planning II . . . . .	15	1.5
	OA 320L	Career Planning II Lab . . . . .	20	1.0
	OA 325	Business Communications . . . . .	25	2.5
	OA 325L	Business Communications Lab . . . . .	30	1.5
	OA 330	Office Administration . . . . .	25	2.5
	OA 330L	Office Administration Lab . . . . .	<u>26</u>	<u>1.3</u>
		Without Externship . . . . .	336	24.8
		With Externship. . . . .	336	23.4
Quarter 4	OA 401	Customer Service . . . . .	15	1.5
	OA 401L	Customer Service Lab . . . . .	20	1.0
	OA 405	Employment Preparation . . . . .	15	1.5
	OA 405L	Employment Preparation Lab . . . . .	20	1.0
	OA 410	Managerial Accounting . . . . .	35	3.5
	OA 410L	Managerial Accounting Lab . . . . .	40	2.0
	OA 415	Entrepreneurship. . . . .	30	3.0
	OA 415L	Entrepreneurship Lab . . . . .	40	2.0
	OA 430E	Externship . . . . .	121	4.0
		Or		
	OA 435	Capstone Project . . . . .	11	1.1
	OA 435L	Capstone Project Lab . . . . .	<u>110</u>	<u>5.5</u>
		Without Externship . . . . .	336	22.1
		With Externship. . . . .	336	19.5
		Program Totals without Externship Option . . . . .	1344	97.0
		Program Totals with Externship Option. . . . .	1344	93.0

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### Computer Applications & Office Administration Course Descriptions

**OA 101 Computer Applications I**

This course covers the basics of computer hardware, software, networks and the internet. The objective is to prepare the student to take the IC3 certification exam.

**OA 101L Computer Applications I Lab**

Directed lab with structured learning.

**OA 105 Business English I**

A concentrated review of sentence writing, this course emphasizes sentence combining, basic mechanics and paragraph writing. Various forms of written business communication will be covered in Business English I including effective composition of letters and electronic communications.

**OA 105L Business English I Lab**

Directed lab with structured learning.

**OA 110 Keyboarding I**

In this course, students learn beginning typing and 10-key skills. The objectives are for students to learn how to type by touch and how to take a timed keyboarding test for accuracy and speed.

**OA 110L Keyboarding I Lab**

Directed lab with structured learning.

**OA 115 Word Processing**

Students learn how to use Microsoft Word for basic and advanced word processing. The objective of this course is to prepare students to take the MCAS certification exam for Word.

**OA 115L Word Processing Lab**

Directed lab with structured learning.

**OA 120 Spreadsheets**

Students learn Microsoft Excel and how to build business and financial applications for forecasting, budgeting and basic book-keeping. The objective of this course is to prepare students to take the MCAS certification exam for Excel.

**OA 120L Spreadsheets Lab**

Directed lab with structured learning.

**OA 130 Database**

Students learn how to create and use databases with Microsoft



Access. The objective of this course is to prepare students to take the MCAS certification exam for Access.

**OA 130L Database Lab**

Directed lab with structured learning.

**OA 201 Business English II**

This course emphasizes basic punctuation and grammar rules and covers sentence structure. The course is designed to introduce basic reading skills and to develop basic writing skills. Coursework emphasizes writing from observation as well as writing in response to readings. The focus is on writing sentences which demonstrate a grasp of basic syntax and usage, and writing sound paragraphs which express a main idea clearly and develop it fully with a minimum of errors in sentence structure, punctuation and spelling.

**OA 201L Business English II Lab**

Directed lab with structured learning.

**OA 205 Computer Applications II**

Students learn Microsoft Publisher to create posters, newsletters, flyers and more, covering topics such as: page layout, command frames, table frames, WordArt, background pages and much more.

**OA 205L Computer Applications II Lab**

Directed lab with structured learning.

**OA 210 Keyboarding II**

In this course students learn how to improve their accuracy and typing speed. Students also learn formatting for personal and business letters, memoranda, simple tabulation techniques, proofreading and editing. This course covers the basics of computer hardware, software, networks and the internet. The objective is to prepare students to take the IC3 certification exam.

**OA 210L Keyboarding II Lab**

Directed lab with structured learning.

**OA 215 Business Presentation**

This course provides instruction in developing presentation materials. Students create a variety of charts, graphs and interactive presentations. Microsoft PowerPoint enables users to quickly create high-impact, dynamic presentations, while integrating workflow and ways to easily share information.

**OA 215L Business Presentation Lab**

Directed lab with structured learning.

**OA 220 Career Planning I**

This course is designed to teach students how to write a professional resume package and to learn basic interviewing skills.

**OA 220L Career Planning I Lab**

Directed lab with structured learning.

**OA 230 Business Etiquette**

This course focuses on the fundamentals of etiquette as it relates to business and business relationships inside and outside the office.

**OA 230L Business Etiquette Lab**

Directed lab with structured learning.

**OA 300E Externship**

Students will learn advanced career planning practices and demonstrate skills and competencies in externship assignments by electing an externship option pending instructor approval. Students must have a "B" or better in current coursework, must not be under any type of probationary contract, and must complete and submit a regular lab work experience employer evaluation. The instructor may terminate industry work experiences at any time if students do not adhere to these requirements.

**OA 301 Business English III (Writing for Business)**

Students learn how to write technical papers, reports, directions, letters and proposals and how to utilize these skills for a career in business.

**OA 301L Business English III Lab**

Directed lab with structured learning.

**OA 305 Business Ethics**

This course examines the ethical challenges facing individuals and businesses in modern society. The course utilizes case studies of professionals working in various areas of business and provides guest speakers with real-world experiences.

**OA 305L Business Ethics Lab**

Directed lab with structured learning.

**OA 315 Financial Accounting**

Students learn QuickBooks software and basic bookkeeping and accounting skills such as accounts payable, accounts receivable, payroll and general ledger.

**OA 315L Financial Accounting Lab**

Directed lab with structured learning.

**OA 320 Career Planning II**

Students learn and study the importance of human resources, financial services, marketing, and business communications.

**OA 320L Career Planning II Lab**

Directed lab with structured learning.

**OA 325 Business Communications**

Students learn various forms of written business communications and effective verbal communications including proper telephone skills.

**OA 325L Business Communications Lab**

Directed lab with structured learning.

**OA 330 Office Administration**

This course is designed to prepare students to manage an office and provides office-related situations including decision-making and critical thinking activities.

**OA 330L Office Administration Lab**

Directed lab with structured learning.

**OA 401 Customer Service**

This course emphasizes how to provide excellent customer service. Students learn proper telephone skills, problem resolution skills and how to handle difficult situations.

**OA 401L Customer Service Lab**

Directed lab with structured learning.

**OA 405 Employment Preparation**

This course develops the personal and professional skills needed to be successful in business. Topics include confidence building, seeking to understand, beginning with clarity, knowing your personality profile, coping with difficult people, and balancing professional and personal priorities individually and in a team environment.

**OA 405L Employment Preparation**

Directed lab with structured learning.

**OA 410 Managerial Accounting**

This course teaches the basic principles and practices of billing, collections, account aging, cash management, account management, report generation and exceptions reporting in an office environment.

**OA 410L Managerial Accounting Lab**

Directed lab with structured learning.

**OA 415 Entrepreneurship**

This course focuses on developing and manufacturing a product, obtaining licenses, writing a business plan, selecting suppliers, setting prices, selecting a financial institution, and developing advertisements for a small business.

**OA 415L Entrepreneurship Lab**

Directed lab with structured learning.

**OA 430E Externship**

Students will learn advanced career planning practices and demonstrate skills and competencies in externship assignments by electing an externship option pending instructor approval. Students must have a "B" or better in current coursework, must not be under any type of probationary contract, and must complete and submit a regular lab work experience employer evaluation. The instructor may terminate industry work experiences at any time if students do not adhere to these requirements.

**OA 435 Capstone Project**

Students will be assigned a capstone project which will provide an opportunity to demonstrate competency in their coursework

**OA 435L Capstone Project Lab**

Directed lab with structured learning.

**Applications & Office Administration  
Book and Tool List**

The book and tool list for students in the Computer Applications & Office Administration Program is intended to be a minimum requirement to complete the program.

**Tool and book costs are approximately \$2,620.** Purchase or lease your laptop computer before school begins.

**Estimated cost of a laptop computer and software is \$1,170.** Your instructor will give details regarding the purchase of your books and supplies on the first day of school. Book and tool prices may vary. The prices stated do not include mark-up for program students or any sales taxes.

**Book List**

**The book cost for Computer Applications & Office Administration is approximately \$1,450.** Changes may be made as more appropriate material is developed or new editions are published. The book list will be provided along with your course syllabi on your first day of school.

**Optional Book:**

A Writer's Reference: 2003 MLA Update by Diana Hacker, 2003.

**Tool List**

Laptop computer with appropriate software  
Dictionary  
Book bag

Students may purchase their computer through a vendor of their choice, including: Dell.com Toshiba.com Sony.com Apple.com Hp.com Gateway.com

Staples, Office Max, Best Buy and Office Depot are authorized PC dealers.

**Laptop Computer and Accessories.  
Approximate cost is \$900**

**Minimum System Requirements:**

Microsoft Vista Operating System  
1 GHz 32-bit (x86) or 64-bit (x64) processor  
1 GB of system memory  
40 GB hard drive with at least 15 GB of available space  
Support for DirectX 9 graphics, or higher with:  
WDDM driver  
128 MB of graphics memory (minimum)  
Pixel Shader 2.0 hardware  
32 bits per pixel  
Carrying case  
USB flash drive – 256 mb

**Software Required  
Approximate cost is \$270**

Microsoft Office 2007  
QuickBooks

## Electrical Technology

The Electrical Technology Program offers students a diversified curriculum that guides them through the process of becoming electricians. During classroom, lab and fieldwork experiences, students gain valuable theory and hands-on application throughout the 24-month program.

The State of Washington Department of Labor & Industries recognizes two years of training received from Perry Technical Institute's Electrical Technology Program toward the journeyman certification. Graduates must accumulate an additional 4,000 hours of electrical work before applying to take their journeyman examination with the State of Washington.

Challenging employment opportunities await graduates of the Electrical Technology Program. The goal for students who successfully complete this course is gainful employment as third-year electrical trainees. The two largest groups of potential employers are electrical construction contractors and electrical departments in manufacturing industries.

The Electrical Technology Program is 24 months in length (six trimesters). The student will earn 165.5 credit hours or 157.5 credit hours (externship option) which are 3,130 clock hours. Tuition is payable on a trimester basis. There are three trimesters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Trimester 1	EL 101	Applied Electrical Math . . . . .	65	4.3
	EL 102	Safety Orientation/School Rules . . . . .	7	.5
	EL 103	Industrial First Aid & CPR . . . . .	7	.5
	EL 104	Safety Meetings . . . . .	15	1.0
	EL 105	DC Fundamentals . . . . .	105	7.0
	EL 106	National Electric Code/WAC Code . . . . .	157	10.5
	EL 107	Introduction to Voltage Systems . . . . .	25	1.7
	EL 108	Wiring Practices & Switch Hook-ups . . . . .	69	4.6
	EL 109L	Lab and Shop Projects . . . . .	<u>50</u>	<u>1.7</u>
		500	31.7	
Trimester 2	EL 201	AC Theory Single Phase . . . . .	100	6.7
	EL 202	AC Motors . . . . .	30	2.0
	EL 203	DC Motors & Generators . . . . .	30	2.0
	EL 204	NEC Review & Testing . . . . .	30	2.0
	EL 205	National Electric Code Articles 430 & 440 . . . . .	35	2.3
	EL 206	Electro-Mechanical Motor Controls . . . . .	115	7.7
	EL 207	Safety Meetings . . . . .	15	1.0
	EL 208L	Lab & Shop Projects . . . . .	<u>145</u>	<u>4.8</u>
		500	28.5	
Trimester 3	EL 301	Introduction to Digital . . . . .	45	3.0
	EL 302	Programmable Logic Controllers . . . . .	125	8.3
	EL 303L	Lab & Shop Projects . . . . .	120	4.0
	EL 304	NEC Review & Testing . . . . .	30	2.0
	EL 305	Blueprint Reading . . . . .	50	3.3
	EL 306	NEC & Load Sizing Calculations . . . . .	115	7.7
	EL 307	Safety Meetings . . . . .	<u>15</u>	<u>1.0</u>
		500	29.3	
Trimester 4	EL 401	AC Theory, Three Phase & Power Factor . . . . .	70	4.7
	EL 402	Three-Phase Systems & Distribution . . . . .	60	4.0
	EL 403	Transformer Connections . . . . .	60	4.0
	EL 404	NEC Articles 450, 500, 680 . . . . .	40	2.7
	EL 405	NEC & Calculations Review . . . . .	30	2.0
	EL 406	Utility Regulations & WAC Code Rules . . . . .	45	3.0
	EL 407	Conduit Bending & Wiring Practices . . . . .	40	2.7
	EL 408L	Lab & Shop Projects . . . . .	140	4.7
	EL 409	Safety Meetings . . . . .	<u>15</u>	<u>1.0</u>
		500	28.7	

			Clock Hours	Credit Hours
Trimester 5	501E	Externship (Field Wiring) . . . . .	600	13.3
	Or EL 501L	Lab (Field Wiring) . . . . .	600	20.0
Trimester 6	EL 601	Solid State Electronic Fundamentals . . . . .	100	6.7
	EL 602	Transistors & Operational Amplifiers . . . . .	45	3.0
	EL 603	Variable Speed Drives . . . . .	60	4.0
	EL 604	NEC & Theory Review & Test . . . . .	50	3.3
	EL 605L	Lab & Shop Projects . . . . .	120	4.0
	EL 606	Safety Meetings . . . . .	15	1.0
	EL 607	Resume/Job Search . . . . .	20	1.3
	EL 608E	Externship (Field Wiring) . . . . .	<u>120</u>	<u>2.7</u>
			530	26.0
		Or EL 601L	Lab (Field Wiring) . . . . .	<u>120</u>
			530	4.0
		Program Totals without Externship Option . . . . .	3130	165.5
		Program Totals with Externship Option . . . . .	3130	157.5

### Electrical Technology Course Descriptions

#### EL 101 Applied Electrical Math

Working fractions, factoring, transposing equations, powers of 10, working with exponents, unit conversions, trigonometric functions and the Pythagorean Theorem. Applying these math facts to the following: Ohm's Law, The Power Formulas, along with other AC and DC theory which need accrual circuit values solved.

#### EL 102 Safety/Orientation/School Rules

Requirements for safety of students and instructors to lead them into the standard practices of industry and proper care and use of school and personal property.

#### EL 103 Industrial First Aid & CPR

Each student is required to have a valid Industrial First Aid & CPR card. An outside agency approved to teach Industrial First Aid & CPR classes and issue cards performs this service.

#### EL 104 Safety Meetings

Each week there will be a safety meeting for the Electrical Department. The meeting has a safety curriculum and a safety video that are covered with the students. Accident reports and unsafe condition reports are reviewed.

Safety demonstrations are performed to show the correct way to use tools, ladders, scaffoldings and other equipment needed in the electrical trade. Industrial product representatives also demonstrate their product lines such as CAD-welding, powder-actuated fastening systems and GFCI protection. The students elect safety officers to represent the Electrical Program at the school's monthly safety committee meeting.

#### EL 105 DC Fundamentals

Basic electrical definitions, current flow through electrical circuits, conventional current flow, series, parallel and series-parallel circuits.

#### EL 106 National Electric Code

Minimum standards for installing and maintaining electrical installations and the maintenance of the systems by NFPA (National Fire Protection Association) based on the most current edition of the code. Laws, rules and regulations that supersede the National Electric Codes minimum standards and are enforced and practiced in the industry.

#### EL 107 Introduction to Voltage Systems

Names, schematics, grounding, configurations and hook-ups of the single-phase transformers used in the industry.

#### EL 108 Wiring Practices & Switch Hook-ups

Proper installation of wire, functions and wiring switches, receptacles and lighting fixtures.

#### EL 109L Lab & Shop Projects

The labs consist primarily of students doing switch hook-ups using non-metallic cable, metallic cable and wire run in conduit.

#### EL 201 AC Theory Single Phase

RL, RC and RLC series circuits and the effects of the inductive and capacitive reactance. Impedance and power factor.

#### EL 202 AC Motors

Single-phase motor hook-ups; reversing externally reversible motors; four major parts of a motor; run winding/start windings; using an OHM meter; and properly connect to line voltages. Three-phase wye connected; high and low voltage connections; delta high and low voltage connections; identify, drawing and numbering 9 and 12 lead wye and delta motors; and reversing three-phase motors.

### **EL 203 DC Motors & Generators**

Differences and similarities between DC motors and generators; calculating the counter EMF generated in the armature of the motor; performance characteristics of DC shunt, series and compound motors; assigning correct polarity to interpoles installed in DC motors; drawing the process of controlling speed of various DC motors; drawing the process of reversing the rotation of any DC motor; determining the speed regulation of DC motors; and calculating power losses and horsepower output of DC motors.

DC generator operations; components of a DC generator; function of various generator components; the theory of operation of different types of DC generators; advantages and disadvantages of different types of generators; recognizing different kinds of generators by their construction details hook-up; schematic diagrams of different generator configurations; connecting generator windings in accordance with established practices; connecting rheostats for the purpose of controlling voltage output; mathematical calculations to predict electrical quantities related to generators; and the costs of electrical power, efficiency and horsepower ratings.

### **EL 204 NEC Code Review & Testing**

Code evaluation, reviewing the code covered in the E1 section of the program.

### **EL 205 National Electrical Code Articles 430 & 440**

NEC Article 430 – Motor feeder short-circuit and ground-fault protection; motor disconnecting means; motor branch-circuit, short-circuit and ground-fault protection; motor circuit conductor; motor controller; motor control circuits; motor overload protection; thermal protection; secondary controller; secondary conductors; and secondary resistors.

NEC Article 440 – Code Section applying to sizing the conductor and protection to central electric space heating equipment; sizing the circuit conductors and protection for a five-horsepower motor used as a blower; the differences in the rules between motors and air conditioning when installing a disconnecting means; sizing the circuit protection device and conductors to an individual air conditioning unit; and testing laboratories' requirements for short-circuit and ground-fault protection and the requirements for air conditioners.



### **EL 206 Electro-Mechanical Motor Controls**

The principles of two- and three-wire controls and the use of relays, mag-starters, timers, sensors, along with the symbols and ladder diagrams needed to make a successful control installation.

Photoelectric controls, thru-beam, retroreflective, diffused and specular types will be addressed. Inductive and capacitive proximity sensors and pressure sensors will be utilized in discussion and lab exercises.

### **EL 207 Safety Meetings**

Each week there will be a safety meeting for the Electrical Department. The meeting has a safety curriculum and a safety video that are covered with the students. Accident reports and unsafe condition reports are reviewed.

Safety demonstrations are performed to show the correct way to use tools, ladders, scaffoldings and other equipment needed in the electrical trade. Industrial product representatives also demonstrate their product lines such as CAD-welding, powder-actuated fastening systems, and GFCI protection. The students elect safety officers to represent the Electrical Program at the school's monthly safety committee meeting.

### **EL 208L Lab & Shop Projects**

Using ladder diagrams, students install the wiring to motor control lab stations. Students will also do troubleshooting after the instructor bugs the station.

### **EL 301 Introduction to Digital**

Logic gates, numbering systems and conversions, along with combination logic.

### **EL 302 Programmable Logic Controllers**

Programmable Logic Controllers focus on Allen-Bradley PLC5, Allen-Bradley SLC500 series, GE Fanuc 90-30, as well as various small fixed I/O type PLCs. The software covered is the RsLogix500, RsLogix5, RsView and RsLinx. Programming concepts range from basic programming to the use of analog controllers. PLC installation, wiring and troubleshooting are also covered in this course.

### **EL 303L Lab & Shop Projects**

The students will use logic diagrams to program inputs and outputs into the PLC, and monitor real-world devices. Students will run the program, observe the process run and troubleshoot problems.

### **EL 304 NEC Review & Testing**

Code evaluation of previously covered code articles.

### **EL 305 Blueprint Reading**

Terms, symbols, layout, organization and structure of plans that are used for residential, commercial and industrial buildings. Identification of code violations and conflicts of space use, conduit versus ducts and safety issues.

### **EL 306 NEC & Load Sizing Calculations**

Covering code Articles 220 and 240 calculating the ampacity of service conductors, feeder conductors, branch circuit conductors, and the amp rating of the panels and load centers they supply, along with the overcurrent devices used to protect them.

**EL 307 Safety Meeting**

Each week there will be a safety meeting for the Electrical Department. The meeting has a safety curriculum and a safety video that are covered with the students. Accident reports and unsafe condition reports are reviewed.

Safety demonstrations are performed to show the correct way to use tools, ladders, scaffoldings and other equipment needed in the electrical trade. Industrial product representatives also demonstrate their product lines such as CAD-welding, powder-actuated fastening systems and GFCI protection. The students elect safety officers to represent the Electrical Program at the school's monthly safety committee meeting.

**EL 401 AC Theory, Three Phase & Power Factor**

Single-phase RL, RC, RLC parallel circuits, vectors, power-factor and correction. Understanding the relationships between current, voltage and power in three-phase configurations. Three-phase RL, RC, RLC circuits, vectors, power factor and correction in wye and delta configurations.

**EL 402 Three-Phase Systems, Distribution & Power-Factor Corrections**

Operational characteristics of three-phase generators and their connection to transformers for the purpose of cross-country power transmission. Circuit characteristics of the transmission and distribution system, the purpose and function of power substations and local power distribution concepts.

**EL 403 Transformer Connections**

ASA, NEMA and industrial standards for transformer lead identification and polarity requirements. Practical application of single-phase isolation type transformer configurations. Practical application of three-phase configurations for isolation-type transformers. Practical application of single- and three-phase buck and boost autotransformers.

**EL 404 National Electric Code Articles 450, 500 & 680 NEC**

NEC Article 450 – Code requirements for sizing of transformer conductors and overcurrent protection.

NEC Article 500 – Requirements for the use of the Class, Division and Group system and the general installation requirements for electrical wiring and apparatus utilized in hazardous locations

NEC Article 680 – Applying the provisions of Article 680 to swimming pools, fountains and similar installations. Forming shell, dry, wet or no niche, pool cover electrically operated, receptacles, lighting fixtures, lighting outlets, switch devices, ceiling suspended paddle fans, electric pool water heaters, underground wiring locations, disconnecting means, permanently installed pools, grounding bonding requirements and common bonding grids, and spa and hot tub requirements.

**EL 405 NEC & Calculations Review**

Evaluation of previously covered code and wire sizing calculations.

**EL 406 Pacific Power Requirements, WAC & Utility Regulations**

Requirements of our local serving utility, Pacific Power. Topics covered will include, but are not limited to, service lateral burial depths, overhead service height requirements, conduit sizing in relation to service ampacities, use of rigid metal conduit, use of PVC conduit, CT installation requirements, support requirements for overhead services and proper use of Pacific Power's required forms and documents. Washington Administrative Code (WAC) and Revised Code of Washington (RCW) requirements for the electrical industry including but not limited to: electrical industry scopes of work, licensing qualifications, exams, fees, penalties, types of certifications and continuing education requirements.

**EL 407 Conduit Bending Practices**

Introduction to the use of hand, hydraulic and PVC conduit benders. Lab exercises will include the following: predetermined 90° stubs, predetermined offsets, box offsets, back-to-back 90° stubs, three-bend saddles, four-bend saddles and kicks.

**EL 408L Lab & Shop Projects**

The student will practice applied wiring techniques in various hands-on exercises and labs including, but not limited to: conduit bending, switch connections, single- and three-phase power factor correction, transformer connections, non-metallic cable, metallic cable, wire pulling, panel, box and device installation and connections.

**EL 409 Safety Meetings**

Each week there will be a safety meeting for the Electrical Department. The meeting has a safety curriculum and a safety video that are covered with the students. Accident reports and unsafe condition reports are reviewed.

Safety demonstrations are performed to show the correct way to use tools, ladders, scaffoldings and other equipment needed in the electrical trade. Industrial product representatives also demonstrate their product lines such as CAD-welding, powder-actuated fastening systems and GFCI protection. The students elect safety officers to represent the Electrical Program at the school's monthly safety committee meeting.



**EL 501E Externship (Field Wiring)**

On-the-job training projects doing hands-on electrical wiring installations in residential and commercial buildings. All trainee electrical installations are supervised by a journeyman electrician and inspected by the Department of Labor and Industries. Completion of an Externship packet is required.

**EL 501L Lab (Field Wiring)**

On-the-job training projects doing hands-on electrical wiring installations on campus. All trainee electrical installations are supervised by an instructor.

**EL 601 Solid State Electronic Fundamentals**

Function and operation of diodes, SCRs, triacs, diacs, UJTs and their use in rectification and control of current by the switching of PN junctions.

**EL 602 Operational Amplifiers**

Construction, theory and operation of transistors and their applications to control voltage levels. Basic operation and theory of the op-amp, variations of connections, using negative feedback.

**EL 603 Variable Speed Drives**

Fundamentals and functions of both DC motor drives and AC variable frequency drives.

**EL 604 NEC & Theory Review & Testing**

Code and theory evaluation, covering material in previous sections of the training program.

**EL 605L Lab & Shop Projects****EL 606 Safety Meetings**

Each week there will be a safety meeting for the Electrical Department. The meeting has a safety curriculum and a safety video that are covered with the students. Accident reports and unsafe condition reports are reviewed.

Safety demonstrations are performed to show the correct way to use tools, ladders, scaffoldings and other equipment needed in the electrical trade. Industrial product representatives also demonstrate their product lines such as CAD-welding, powder-actuated fastening systems and GFCI protection. The students elect safety officers to represent the Electrical Program at the school's monthly safety committee meeting.

**EL 607 Resume/Job Search**

Preparation for an effective job search. Resume preparation, interviewing skills and the job application process.

**EL 608E Externship (Field Wiring)**

Students who have had a job offer as an electrician may leave the program and work in the field under a training extern agreement with Perry Technical Institute, the employer and the student.

**EL 608L Lab (Field Wiring)**

On-the-job training projects doing hands-on electrical wiring installations on campus. All trainee electrical installations are supervised by an instructor. Completion of an Externship packet is required.

## Electrical Technology Book List, Tool List and Field Trips

The book and tool list for students in the Electrical Technology Program is intended to be a minimum requirement to complete the program.

**Tool and book costs are approximately \$3,500.** The tools and books may be purchased anywhere you choose. Please make sure that your purchases are equivalent to the listed items. Tools will be required within the first six weeks of school. Books are available at Perry Technical Institute. Students may purchase all their books at the beginning or as classes progress. Students must, however, have their books with them at the beginning of each new trimester when they change classes.

Touring industrial facilities such as hydroelectric dams, steam generation sites, manufacturing plants and mills is educational and of great benefit to electrical trainees. Students will be required to attend any field trips scheduled by the instructor during the course. **The cost of field trips can run between \$600 to \$700 and will be at the student's expense.**

### Book List

**The book cost for the first section of the Electrical Technology Program is \$430. Total book costs equal approximately \$1,100.** Changes may be made as more appropriate material is developed or new editions are published. Book prices may vary. The prices stated do not include any mark-up for program students or any sales taxes.

**Required Books:**

10 DGT .89 FNCT Solar Sci Calculator  
Ferm's Fast Finder  
Motor Control Templates  
National Electric Code  
Stallcup Electrical Design  
DC Fundamentals  
Tom Henry NEC Tabs  
Understanding the National Electrical Code Vol. I & II  
Code Changes Text, as needed every three-year cycle  
AC Fundamentals  
Electrical Motor Controls  
Conduit Bending  
Allan Bradley Program Instruction Set  
Programmable Logic Controllers  
Printreading NEC  
The Electrical Plan Reading Work Book  
Electronics for Industrial Electricians  
Variable Speed Drives  
Power Quality Measurement and Troubleshooting

**Optional Books:**

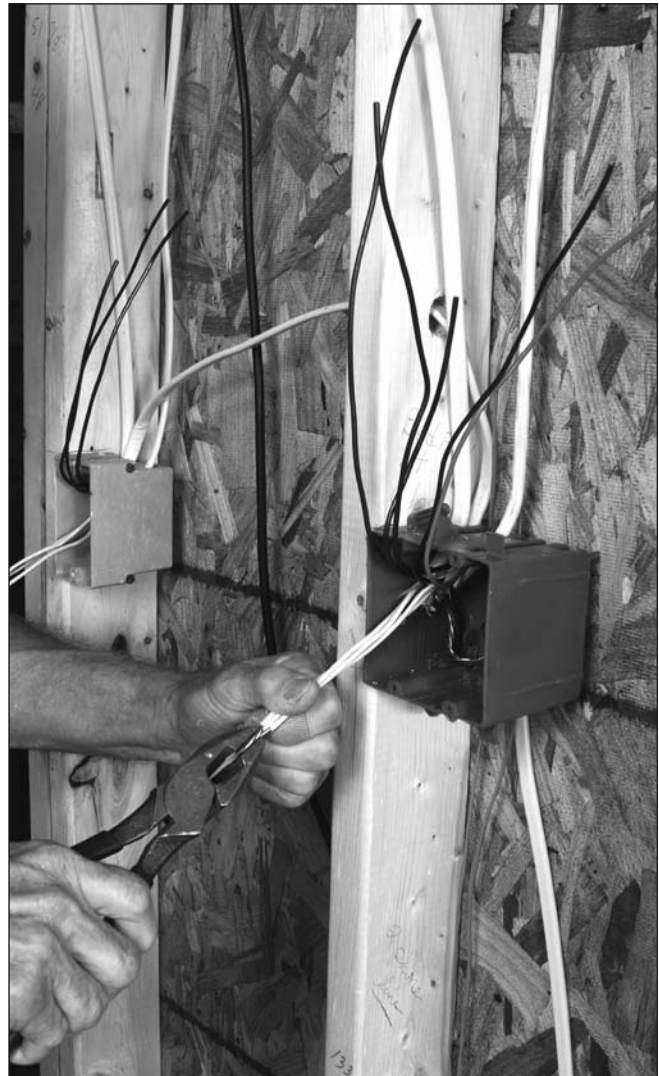
Analysis of National Electrical Code  
Electrical General EICP/IAEI  
Electrical Motor Repair  
NEC Generic LL Tab

## Tool List

Tool prices may vary. The prices stated do not include any mark-up for program students or any sales taxes.

50' 14/3 SJ all-weather extension cord  
100' 12/3 all-weather extension cord with triple tap end  
In-line GFCI cord protector  
25' 16/3 SJ yellow trouble light w/rough service lamp  
Two 12" channel lock pliers  
Two 16" channel lock pliers  
Industrial flashlight w/batteries  
1/2" - 2" ratchet KO set  
Wire stripper (10 -18 AWG solid)  
Romex stripper #14/2 NM-B to #12/2 NM-B  
Romex stripper #10/2 NM-B to #12/2 NM-B  
Electrical Romex stripping knife for #14/3 NM-B, #12/3 or #10/3 NM-B & larger  
Gold fish leader  
Fuse puller (medium size)  
Crimp tool  
5" needle nose pliers  
7" needle nose pliers  
9" lineman's pliers  
8" angle cutters  
3/16" X 10" slotted screw-holding screwdriver  
Right hand or left hand nail pouch  
1/8"x 200' steel fish tape  
6" expanded jaw crescent wrench  
12" expanded jaw crescent wrench  
1/2" conduit bender and handle  
3/4" conduit bender and handle  
Conduit reaming tool  
Tin snips  
1/2" X 12" round file  
1" X 12" flat file  
Slim triangle file 3/8" X 8"  
Tool pouch eight-pocket extra capacity tool pouch  
2" tool pouch belt  
1"x 6" auger bit  
Stubby screwdriver (1-1/2" square shank) standard  
Stubby screwdriver (1-1/2" square shank) #2 Phillips  
4" square shank screwdriver standard  
6" square shank screwdriver standard  
8" square shank screwdriver standard  
4" shank screwdriver # 2 Phillips  
6" cabinet tip screwdriver  
#2 LR driver for locked recessed square screws  
1/4" x 4 1/4" center punch  
6" shank speed driver standard  
Large folding Allen wrench set (3/16" - 3/8")  
Small folding Allen wrench set (1/6" - 5/32")  
20 oz. straight claw hammer with non-conductive handle  
1" x 25' steel rule  
Magnetic torpedo level (no dog)  
Safety glasses – clear  
20-piece 3/8" drive socket set  
Utility knife  
15-piece drill bit set  
9-piece end wrench set (1/4" - 3/4")  
Tool box or bag  
Hard hat  
Nut driver set – long shank

Solenoid type voltage tester  
Fluke T5-1000 digital voltage tester (V-Ω-A)  
Fluke 335 digital clamp around amp meter  
Fluke 87 – 5E digital multi-meter kit  
12 lab alligator double clip leads 12"  
12" hacksaw  
Sheet rock saw  
Carpenter square  
Plumb bob  
Chalk line box & chalk  
Electricians' hole saw kit 7/8" -2"  
Uni-bit step bit 1&1/8"  
1/2" heavy duty electric drill  
1/4" X18" bell hanger bit  
Low-temp solder station (iron & holder)  
Solder sucker  
Lockout /tagout set  
Cordless drill – 12 volt, 1/2" chuck  
Tips for cordless drill :  
1 each –2", 4" & 6" long standard tip  
2", 4" & 6" long #2 Phillips tip  
2", 4" & 6" long #2 LR (locked recess) tip  
Small protractor





## Graphic Technology

The Graphic Technology Program curriculum develops the skills needed by individuals desiring employment and/or self-employment as computer graphics professionals. The graphics field offers PTI graduates diverse employment opportunities in photography, digital imaging, illustration, desktop publishing, pre-press and imposition, sign design and application, Web site development and more.

The program covers a wide variety of assignments similar to those that graduates will be required to produce in the workplace. Industry standards are stressed and creative abilities are challenged, through hands-on applications.

The PTI Graphic Technology Department is a member of the Yakima Advertising Federation (an affiliate of the American Advertising Federation) and the International Sign Association. These memberships offer students opportunities to network with industry professionals, participate in award competitions and other activities.

The goal for those who successfully complete the Graphic Technology Program is entry-level employment in their chosen occupation within the graphics field and success as a visual communications professional.

The Graphic Technology Program is 18 months in length. The student will earn 130.8 credit hours, which are 2,016 clock hours. Students may do an externship dependent on satisfactory completion of the first three quarters of the program. Externships are dependent on a satisfactory host site that will provide the job skills training to enhance skills and concepts taught in the Graphics Program. Students participating in an externship may earn up to 22.3 credit hours, which are 670 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	GA 105	Illustration I . . . . .	20	2.0
	GA 105L	Illustration I Lab . . . . .	40	2.0
	GA 110	Design I . . . . .	30	3.0
	GA 110L	Design I Lab . . . . .	78	3.9
	GA 115	Mac/Windows Platform . . . . .	10	1.0
	GA 115L	Mac/Windows Platform Lab . . . . .	40	2.0
	GA 120	Imaging . . . . .	40	4.0
	GA 120L	Imaging Lab . . . . .	<u>78</u>	<u>3.9</u>
		336	21.8	
Quarter 2	GA 205	Web Site Design & Development I . . . . .	40	4.0
	GA 205L	Web Site Design & Development I Lab . . . . .	78	3.9
	GA 210	Employment Preparation I . . . . .	10	1.0
	GA 210L	Employment Preparation Lab I . . . . .	40	2.0
	GA 215	Illustration II . . . . .	20	2.0
	GA 215L	Illustration II Lab . . . . .	40	2.0
	GA 220	Sign Design I . . . . .	30	3.0
	GA 220L	Sign Design I Lab . . . . .	<u>78</u>	<u>3.9</u>
		336	21.8	
Quarter 3	GA 305	Photography I . . . . .	20	2.0
	GA 305L	Photography I Lab . . . . .	40	2.0
	GA 310	Vector Graphics . . . . .	30	3.0
	GA 310L	Vector Graphics Lab . . . . .	78	3.9
	GA 315	Prepress & Imposition . . . . .	20	2.0
	GA 315L	Prepress & Imposition Lab . . . . .	60	3.0
	GA 320	Web Site Design & Development II . . . . .	30	3.0
	GA 320L	Web Site Design & Development II Lab . . . . .	<u>58</u>	<u>2.9</u>
		336	21.8	

			Clock Hours	Credit Hours
Quarter 4	GA 400E	Externship	236	7.9
	or the following labs: GA 405L, GA 410L, GA 415L, GA 420L			
	GA 405	Illustration III	20	2.0
	GA 405L	Illustration III Lab	40	2.0
	GA 410	Sign Design II	30	3.0
	GA 410L	Sign Design II Lab	78	3.9
	GA 415	Photography II	20	2.0
	GA 415L	Photography II Lab	40	2.0
	GA 420	Publishing	30	3.0
	GA 420L	Publishing Lab	<u>78</u>	<u>3.9</u>
		Without externship	336	21.8
		With externship	336	17.9
Quarter 5	GA 500E	Externship	236	7.9
	or the following labs GA 505L, GA 510L, GA 515L, GA 520L			
	GA 505	Web Site Design & Development III	30	3.0
	GA 505L	Web Site Design & Development III Lab	58	2.9
	GA 510	Advertising	20	2.0
	GA 510L	Advertising Lab	60	3.0
	GA 515	Illustration IV	20	2.0
	GA 515L	Illustration IV Lab	40	2.0
	GA 520	Sign Design III	30	3.0
	GA 520L	Sign Design III Lab	<u>78</u>	<u>3.9</u>
		Without externship	336	21.8
		With externship	336	17.9
Quarter 6	GA 600E	Externship	198	6.6
	or the following labs GA 605L, GA 610L, GA 615L, GA 620L			
	GA 605	Photography III	20	2.0
	GA 605L	Photography III Lab	40	2.0
	GA 610	Print Design I	30	3.0
	GA 610L	Print Design I Lab	78	3.9
	GA 615	Employment Preparation II	10	1.0
	GA 615L	Employment Preparation Lab II	40	2.0
	GA 620	Print Design II	20	2.0
	GA 620L	Print Design II Lab	40	2.0
	GA 625	Portfolio Development	20	2.0
	GA 625L	Portfolio Development Lab	<u>38</u>	<u>1.9</u>
		Without externship	336	21.8
		With externship	336	18.5
	Program Totals without Externship Option		2016	130.8
	Program Totals with Externship Option		2016	119.6

### Graphic Technology Course Descriptions

**GA 105 Illustration I**

Illustration basics introduced and reviewed with hand sketching, shapes, shading, sighting, typography and color. Introduction to digital illustration software, hardware and techniques.

**GA 105L Illustration I Lab**

Directed lab with structured learning.

**GA 110 Design I**

Introduction to design basics, principles, process, formats and terminology. Study of basic typography significance, history,

composition, legibility and layout in combination with images and color in logos and designs.

**GA 110L Design I Lab**

Directed lab with structured learning.

**GA 115 Mac/Windows Platform**

Functions of Macintosh and Windows computer operating systems. Use of menus, tools, printing and testing of keyboarding skills. Network and Internet navigation.

**GA 1115L Mac/Windows Platform Lab**

Directed lab with structured learning.

**GA 120 Imaging**

Use of menus and tools, file formats and resolution. Scanning a variety of media using different types of hardware. Color and tonal correction and compression.

**GA 120L Imaging Lab**

Directed lab with structured learning.

**GA 205 Web Site Design & Development I**

Introduction to interactive Web multimedia, including motion, sound and video.

**GA 205L Web Site Design & Development I Lab**

Directed lab with structured learning.

**GA 210 Employment Preparation I**

Development of resume, cover letter and references page. Exploration of job shadow and externship opportunities.

**GA 210L Employment Preparation Lab I**

Directed lab with structured learning.

**GA 215 Illustration II**

Study and application of digital illustration tools, selections, masks, layers using photos and combination of painting and photography.

**GA 215L Illustration II Lab**

Directed lab with structured learning.

**GA 220 Sign Design I**

Introduction to the sign industry, digital sign design software and visual study of existing signage, logos and creative text.

**GA 220L Sign Design I Lab**

Directed lab with structured learning

**GA 305 Photography I**

Introduction to photography, the camera and its functions. Basic photographic techniques are applied, including proper exposure, outdoor and ambient lighting, and composition.

**GA 305L Photography I Lab**

Directed lab with structured learning.

**GA 310 Vector Graphics**

Use of file formats, menus and tools. Creation of vector-based graphics using industry-standard software.

**GA 310L Vector Graphics Lab**

Directed lab with structured learning.

**GA 315 Prepress & Imposition**

Technical specifications required to print using the cyan/magenta/yellow/black color model. Sequencing and orientation of publication pages to print in proper order.

**GA 315L Prepress & Imposition Lab**

Directed lab with structured learning.

**GA 320 Web Site Design & Development II**

Introduction to Extensible Hypertext Markup Language, Cascading Style Sheets and image optimization.

**GA 320L Web Site Design & Development II Lab**

Directed lab with structured learning.

**GA 400E Externship**

Practical experience in a workplace environment.

**GA 405 Illustration III**

Study and application of digital illustration special effects, type effects and combination with Photoshop. Study of traditional illustration in mainstream marketing.

**GA 405L Illustration III Lab**

Directed lab with structured learning.

**GA 410 Sign Design II**

Introduction to the sign industry history, terminology, materials and equipment. Introduction to pricing and manufacturing of signage. Advanced use of digital sign design software.

**GA 410L Sign Design II Lab**

Directed lab with structured learning.

**GA 415 Photography II**

Basic studio lighting, advertising photography, outdoor and studio portraits. Guidance and application of architecture and outdoor photography.

**GA 415L Photography II Lab**

Directed lab with structured learning.

**GA 420 Publishing**

Production of forms, advertising and multi-page documents using desktop publishing software.

**GA 420L Publishing Lab**

Directed lab with structured learning.

**GA 500E Externship**

Practical experience in a workplace environment.

**GA 505 Web Site Design & Development III**

Introduction to site planning and layout, including navigation maps, page design comps, construction strategies, tools and techniques, domain registration, hosting and FTP.

**GA 505L Web Site Design & Development III Lab**

Directed lab with structured learning.

**GA 510 Advertising**

Brief overview of advertising history, philosophy and ethics. Creation of advertising media with prepress requirements.

**GA 510L Advertising Lab**

Directed lab with structured learning.

**GA 515 Illustration IV**

Study and application of advanced digital illustration techniques in mainstream marketing.

**GA 515L Illustration IV Lab**

Directed lab with structured learning.

**GA 520 Sign Design III**

Application of vinyl signage, large format digital printing, and vehicle graphics using proprietary software and equipment for the commercial sign industry.

**GA 520L Sign Design III Lab**

Directed lab with structured learning.

**GA 600E Externship**

Practical experience in a workplace environment.

**GA 605 Photography III**

Advanced studio techniques. Students pursue independent photo projects.

**GA 605L Photography III Lab**

Directed lab with structured learning.

**GA 610 Print Design I**

Introduction to a variety of print design types using software, emphasizing layout and composition.

**GA 610L Print Design I Lab**

Directed lab with structured learning.

**GA 615 Employment Preparation II**

Exploration of employment search resources, employment application, interview techniques and small business planning.

**GA 615L Employment Preparation Lab II**

Directed lab with structured learning.

**GA 620 Print Design II**

Advanced production of a variety of independent projects, emphasizing branding, target audience and other considerations.

**GA 620L Print Design II Lab**

Directed lab with structured learning.

**GA 625 Portfolio Development**

Development of portfolios that students will use for employment search, job interviews and/or self-employment.

**GA 625L Portfolio Development Lab**

Directed lab with structured learning.

**Graphic Technology  
Book and Tool List**

The book and tool list for students in the Graphic Technology Program is intended to be a minimum requirement to complete the program.

**Tool and book costs are approximately \$3,595.** Purchase or lease your laptop computer before school begins.

**Estimated cost of a laptop, with case and pen tablet, is up to \$1,200.**

**Please be prepared to pay approximately \$150 for books and art kit the first day and \$825 more for additional supplies, books and tools during the first quarter of class.** The remainder will be paid throughout the 18 months of the course. Your instructor will give details regarding the purchase of your books and supplies on the first day of school. Book and tool prices may vary. The prices stated do not include mark-up for program students or any sales taxes.

**Book List**

**The book cost for Graphics is approximately \$535.** Changes may be made as more appropriate material is developed or new editions are published.

- Adobe Photoshop
- Adobe Illustrator
- Adobe InDesign
- Adobe Acrobat
- Adobe Flash
- Adobe Dreamweaver
- Digital Photography
- Computer Operating System
- Corel Painter
- Design (purchased the first day of class)
- Drawing (purchased the first day of class)
- Pre-Press (recommended)
- HTML/XHTML/CSS



## Tool List

Art Kit and Supplies: **Approximate cost is \$150.**

**Camera and accessories kit:** The following is intended to be used as a minimum guide. Please ask an instructor for specifications before purchasing cameras.

**Approximate cost of camera is up to \$400**

**Approximate cost of camera accessories is up to \$150**

Digital Camera – 5 megapixel resolution (minimum) with manual focus, manual exposure, 8x optical zoom and hot shoe

512 mb (minimum) memory storage for camera

Camera case, tripod, cleaning kit

Filter Set – UV and polarizing

Flash – optional

Extra battery – optional

**Purchase of a personal laptop computer before class starts is required.** Academic versions of graphics software are available at reduced prices while you are enrolled as a student.

Students may purchase their computer through a vendor of their choice, including: Dell.com Toshiba.com Sony.com Apple.com Hp.com Gateway.com

Staples, Office Max, Best Buy and Office Depot are authorized PC dealers.

### Laptop Computer and Accessories

#### Minimum System Requirements for PC:

Intel Core 2 Duo processor or AMD equivalent  
Windows XP OS w/ service pack 2, or Vista OS  
2gb RAM  
128mb video RAM  
60gb hard drive or larger  
USB port  
DVD burner  
Carrying case  
Pen/mouse drawing tablet  
USB flash drive, (Mac & PC compatible) 1gb

#### Minimum System Requirements for Mac:

G4, G5 or Intel-based Core 2 Duo processor  
Mac OS X 10.4.8 or higher  
Windows XP OS w/service pack 2, or Vista OS  
2gb RAM  
128mb video RAM  
60gb hard drive or larger  
USB port  
DVD burner  
Carrying case  
Pen/mouse drawing tablet  
USB flash drive, (Mac & PC compatible) 1gb

### Software Required

Software will be purchased after starting class. Students will receive information on which versions to purchase and available vendors. **Approximate cost is \$780.**

**Windows operating system will be required for Mac users. Approximate cost is \$100.**

Adobe Creative Suite Design Premium  
CorelDRAW  
Corel Painter

### Expendable Supplies Kit

Computer disks, business cards, Web domain and hosting, batteries, etc. **Approximate cost is \$10 a month for the 18-month course.**

Portfolio expenses – **\$100 in the sixth quarter.**



## HVAC/R Technology Heating, Ventilation, Air Conditioning & Refrigeration

Perry Technical Institute's two-year HVAC/R Technology Program is divided into four sections: 1) HVAC/R Fundamentals 2) Residential/Light Commercial HVAC/R 3) Commercial Refrigeration and 4) Industrial HVAC/R. Classroom and shop training prepares students to enter the HVAC/R industry as qualified entry-level technicians who enjoy outstanding employment opportunities. The students learn the curriculum through classroom and extensive hands-on training. Approximately 50% of the time will encompass lab or lab-related instruction.

Perry Technical Institute's HVAC/R Program is approved by Washington State Department of Labor & Industries as a 06A HVAC/R Specialty Electrical Training program. Graduates will be credited with one year (or 2,000 hours) towards the two years (or 4,000 hours) required by the State of Washington to be eligible to take the certification exam for the 06A HVAC/R Specialty Electrical License.

Students have the opportunity to gain industry certifications in several areas, giving them competitive advantages in the employment market. Externships with employers are encouraged during the last three months of training.

The HVAC/R Technology is 24 months in length. The student will earn 216 credit hours (class option) or 197.8 credit hours (externship option) which are 2,688 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

During the eighth-quarter training, a student has the option of working in an externship with an employer or choosing the ammonia-based training provided at the school.

### Program Outline

			Clock Hours		Credit Hours
Quarter 1	RE 101	Electrical & Tool Safety .....	10		1.0
	RE 102	First Aid .....	7		0.7
	RE 103	Applied Mathematics for Electricity & Electronics .....	40		4.0
	RE 104	Electrical/HVAC/R Tools & Equipment .....	8		0.8
	RE 105	Refrigerant EPA. Regulations .....	7		0.7
	RE 106	The Refrigeration System, Electrical & Mechanical .....	60		6.0
	RE 107	Equipment Retrofit of Oils & Refrigerants .....	2		0.2
	RE 108	Electrical/HVAC/R Computer Software .....	14		1.4
	RE 109	Electrical Fundamentals .....	32		3.2
	RE 110	Interpreting Schematic & Ladder Diagrams .....	20		2.0
	RE 111L	Silver Brazing Lab .....	8		0.4
	RE 112L	Laboratory Projects/Shop Work .....	<u>128</u>		<u>6.4</u>
		336		26.8	
Quarter 2	RE 200	The Refrigeration System, Electrical/Mechanical .....	40		4.0
	RE 201	Interpreting Schematic & Ladder Wiring Diagrams .....	40		4.0
	RE 202	Fundamentals of Electricity .....	40		4.0
	RE 203	Electric Heat Operating & Safety Controls .....	66		6.6
	RE 204L	Laboratory Projects/Shop Work .....	<u>150</u>		<u>7.5</u>
		336		26.1	
Quarter 3	RE 301	Industrial & Electrical Safety .....	20		2.0
	RE 302	Proper Use of Tools & Equipment .....	30		3.0
	RE 303	Proper Use & Handling of Refrigerants .....	20		2.0
	RE 304	Indoor Air Quality .....	20		2.0
	RE 305	Electrical Motors & Diagrams .....	35		3.5
	RE 306	Controls and Theory .....	20		2.0
	RE 307	Heating & Cooling Equipment .....	30		3.0
	RE 308L	Laboratory Projects/Shop Work .....	47		2.4
	RE 309L	Sheet Metal Lab .....	14		0.7
	RE 310L	Application of Heating & A/C Lab .....	75		3.8
	RE 311L	Application of Controls Lab .....	<u>25</u>		<u>1.3</u>
		336		25.6	

			Clock Hours	Credit Hours
Quarter 4	RE 400	Electrical Diagrams	20	2.0
	RE 401	Heating & Cooling Equipment	20	2.0
	RE 402	Theory of Combustion	20	2.0
	RE 403	Psychrometrics	20	2.0
	RE 404L	Application of Heating & A/C Lab	65	3.3
	RE 405	Residential Duct Design	28	2.8
	RE 406L	Application of Controls Lab	25	1.3
	RE 407	Residential Load Calculations	30	3.0
	RE 408	Air Distribution & Balance	20	2.0
	RE 409	Oil Heat	10	1.0
	RE 410L	Oil Heat Lab	10	0.5
	RE 411L	Laboratory Projects/Shop Work	<u>68</u>	<u>3.4</u>
		336	25.2	
Quarter 5	RE 501	WAC & NEC for HVAC/R	25	2.5
	RE 502	Commercial Systems & Components	50	5.0
	RE 503	Troubleshooting Commercial Systems	25	2.5
	RE 504	Electrical Theory, Circuits, Controls & Wiring Schematics	50	5.0
	RE 505	Commercial Compressors	15	1.5
	RE 506	Refrigerant Retrofits	20	2.0
	RE 507	Evaporators, Condensers & Cooling Towers	10	1.0
	RE 508L	Laboratory Projects/Shop Work	<u>141</u>	<u>7.1</u>
		336	26.6	
Quarter 6	RE 601	WAC & NEC for HVAC/R	25	2.5
	RE 602	Commercial Systems & Components	20	2.0
	RE 603	Electrical Theory-Circuits, Controls & Wiring Schematics	45	4.5
	RE 604	Heat Load & Piping Calculations for Commercial Equipment	40	4.0
	RE 605	Commercial Ice & Ice Cream Machines	35	3.5
	RE 606	Ultra-Low Temperature Systems	20	2.0
	RE 607	Troubleshooting Commercial Systems	20	2.0
	RE 608L	Laboratory Projects/Shop Work	<u>131</u>	<u>6.6</u>
		336	27.1	
Quarter 7	RE 701	Direct Digital Controls	55	5.5
	RE 702	Central Fan Systems	20	2.0
	RE 703	Pneumatic Systems	20	2.0
	RE 704	Industrial Chiller & Boiler Systems	65	6.5
	RE 705	Water Treatment for HVAC Systems	15	1.5
	RE 706	Hydronic Heating Systems	30	3.0
	RE 707	Residential/Commercial HVAC/R Systems Review	45	4.5
	RE 708L	Laboratory Projects	<u>86</u>	<u>4.3</u>
		336	29.3	
Quarter 8	During this quarter a student has the option of working in an externship with an employer or choosing the Ammonia Based training provided at the school.			
	RE 800	Externship	336	11.2
	OR			
	RE 801	Industrial & Ammonia Plant Safety	40	4.0
	RE 802	Ammonia Refrigeration & Electrical Systems	70	7.0
	RE 803	Industrial Compressors	50	5.0
	RE 804	Industrial Maintenance	40	4.0
	RE 805	Industrial Electrical Systems	50	5.0
	RE 806L	Laboratory Projects	<u>86</u>	<u>4.3</u>
			336	29.3
Program Totals without Externship Option			2688	216.0
Program Totals with Externship Option			2688	197.8

## HVAC/R Technology Course Descriptions

### **RE 101 Electrical & Tool Safety**

Safety topics for both the classroom and shop environment. Specific tools, procedures and equipment.

### **RE 102 First Aid**

First aid and CPR training. First aid card given upon successful completion of class.

### **RE 103 Applied Mathematics for Electricity & Electronics**

Mathematics used for electrical theory, series/parallel/com-bination electrical circuits, algebraic formulas, exponents, electronic units of measure, Ohm's Law, Watts Law/Power, areas and volume. Application for mathematics will continue to be covered during second quarter of instruction.

### **RE 104 Electrical/HVAC/R Tools & Equipment**

Safety practices and working concepts of electrical measuring instruments, hand tools, including tools and equipment such as Voltmeter, Ammeter, Ohmmeter, refrigerant recovery equipment, vacuum pumps, oxy-acetylene torches, thermistor vacuum gages and gage manifolds.

### **RE 105 Refrigerant EPA Regulations**

The rules and regulations concerning the handling of refrigerants. Upon successful completion, student will become universally certified under the 608 provisions of the Environmental Protection Agency.

### **RE 106 The Refrigeration System, Electrical & Mechanical**

Four main components of a mechanical compression refrigeration system, each of their functions within the system including the pressures and temperatures associated with each component, along with fluid flow, state change, heat transfer both sensible and latent. Motor operation, function, troubleshooting, replacement and maintenance.

### **RE 107 Equipment Retrofit of Oils & Refrigerants**

Retrofitting existing systems with an alternative refrigerant due to costs and/or environmental concerns. Alternative refrigerants characteristics including changes in pressures, temperatures, charging techniques, and compatible oils.

### **RE 108 Electrical HVAC/R Computer Software**

Training on computers using software specifically tailored to the needs of the refrigeration technician. Software concentrates on the fundamentals required to be successful in the trade including electrical fundamentals; series, parallel and combination electrical circuits; operation of electrical components; operation of volt and ohmmeters; electrical troubleshooting by application and use of electrical diagrams and electrical meters; area and volume calculations; types of heat and heat transfer; gas laws; temperature scales (Fahrenheit, Celsius, Rankin and Kelvin); absolute and gage pressures; pressure enthalpy diagrams; and function and operation of compressor, evaporator, condenser and metering devices.

### **RE 109 Electrical Fundamentals**

Electrical safety, atomic structure, electron flow theory, voltage current resistance relationships (Ohm's Law); heating, operat-

ing and safety controls; heat and magnetism produced by current flow; electrical, series and parallel circuits; resistive and inductive loads; conductors (hot, neutral and safety ground); and measuring instruments. 120-volt circuits.

### **RE 110 Interpreting Schematic & Ladder Diagrams**

Tracing of electric circuits and the study of controls, their use and installation. Conversion of schematic to ladder diagrams. The development of electrical diagrams so as to meet required system operation. Sequence of operation of equipment by "reading" electrical diagrams. Troubleshooting by use of electrical diagrams.

### **RE 111L Silver Brazing Lab**

Introduction to proper joining of copper to copper and copper to steel tubing by use of oxy-acetylene torches.

### **RE 112L Laboratory Projects/Shop Work**

Practical application of classroom instruction on actual equipment. Application and use of electrical and HVAC/R tools and equipment. Introduction to servicing residential refrigerators and freezers. Lab time includes the following: electrical checks, wiring and operations of relays, capacitors, cold controls, defrost controls, heaters, thermostats, compressor and fan motors. Mechanical checks of the refrigeration system. Repair of customer equipment on campus.

### **RE 200 The Refrigeration System, Electrical & Mechanical**

Expansion of material on the four main components of a mechanical compression refrigeration system includes motor operation, function, troubleshooting and wiring.

### **RE 201 Interpreting Schematic & Ladder Wiring Diagrams**

Tracing of electric circuits and the study of controls, their use and installation. Conversion of schematic to ladder diagrams. The development of electrical diagrams so as to meet required system operation. Sequence of operation of equipment by "reading" electrical diagrams. Troubleshooting by use of electrical diagrams.

### **RE 202 Fundamentals of Electricity**

Expansion of material on electrical fundamentals including electrical safety, voltage current resistance relationships, Ohm's Law, heat and magnetism produced by current flow, electrical circuits, series and parallel circuits and 120-, 240- and 24-volt circuits.

### **RE 203 Electrical/Heating Equipment, Operating & Safety Controls**

Electrical/electrical mechanical/solid state and mechanical operating and safety controls. Introduction to operating and safety controls as related to domestic refrigeration systems and electric forced air furnaces. Theory, application and operation of these controls so as to allow students to apply this knowledge on various equipment types. 120-, 240- and 24-volt controls. Introduction to residential forced air electric furnaces and controls. Topics include maintenance, airflow calculations, temperature rise, and reading and developing wiring diagrams. Operation and troubleshooting of electric heat sequencers,



transformers, thermostats, motors, capacitors, heating elements, safety devices, relays and contactors.

**RE 204L Laboratory Projects/Shop Work**

This section of the course is used for practical application of principles introduced in the classroom. Lab time includes the following: Emphasis on electrical measurements for troubleshooting and hands on wiring of equipment. Electrical checks, wiring and operations of relays, capacitors, single and multi-speed single phase fractional horsepower motors (shaded pole, PSC, CSR) heaters, low-voltage heat/cool thermostats, compressor and fan motors. Shop time is used for wiring, troubleshooting and maintaining controls as well as actual operation and troubleshooting of electric furnaces and their controls.

**RE 301 Industrial/Electrical Safety**

Review and reinforcement of shop safety procedures and techniques. Introduction to fall protection and ladder safety with emphasis on application of all safety-related concepts in the workplace or shop environments. Proper lockout/tagout of electrical equipment, as well as equipment safety grounding procedures, are introduced. NEC compliance Articles 100 and 250.

**RE 302 Proper Use of Tools & Equipment**

Proper use and application of tools utilized in the HVAC trade. Examples of tools would include refrigerant recovery equipment, vacuum pumps, electronic scales, and micron gauges. Proper use of digital multi-meters, ammeters and temperature analyzers is emphasized.

**RE 303 Proper Use & Handling of Refrigerants**

Safe handling of refrigerants. Proper HVAC system charging, refrigerant recovery and applications of R-22 and R-410A.

**RE 304 Indoor Air Quality**

The fundamentals of air filtration, including all types of air filters associated with residential and light commercial HVAC systems, from disposable air filters to state-of-the-art electronic air cleaners. Humidification and types of humidifiers are covered as well.

**RE 305 Electric Motors & Wiring Diagrams**

Interpretation of both ladder and pictorial type wiring diagrams. ARI standard graphic electrical symbols are introduced and applied to electrical diagrams. All types of single-phase motors are discussed. NEC compliance using Article 430.

**RE 306 Controls & Theory**

Introduced to specific controls and control strategies that relate to residential and light commercial HVAC/R systems. Types of controls included range from residential and commercial programmable setback thermostats to HVAC system protection controls and safeties. NEC compliance, Article 725 and Table 11A.

**RE 307 Heating & Cooling Equipment**

Residential and light commercial HVAC equipment, both packaged and split systems. Heating systems covered include fossil fuel units, such as natural and LP gas units. Oil heating systems, electric heating and heat pump systems.

**RE 308L Laboratory Projects/Shop Work**

Typical lab projects will include tasks such as soldering, steel pipe threading, wiring and proper refrigerant charging of A/C units.

**RE 309L Sheet Metal Lab**

Basic sheet metal fabrication concepts. Fabrication of several sheet metal projects using not only purchased sheet metal hand tools, but the heavier shop fabrication equipment associated with HVAC duct systems. Examples include hand-operated brakes, manual and electro-mechanical shears.

**RE 310L Application of Heating & A/C Lab**

Application of concepts learned in the classroom to operational HVAC equipment. Hands-on orientation and application of mechanical and electrical concepts as they relate to residential and light commercial HVAC/R equipment.

**RE 311L Application of Controls Lab**

Application of control strategies to wire and operate several types of HVAC equipment. Types of systems include heat pumps, oil, gas and electric forced air HVAC systems. Both packaged and split systems are addressed.

**RE 400 Electrical Diagrams**

Interpretation of both ladder and pictorial type wiring diagrams relating to residential and light commercial HVAC systems. Additional ARI standard graphic electrical symbols are introduced and applied to electrical diagrams. NEC compliance using Article 300

**RE 401 Heating & Cooling Equipment**

Residential and light commercial HVAC equipment, both packaged and split systems. Heating systems covered include fossil fuel units, such as natural, LP gas units, oil heating systems, electric heating and heat pump systems.

**RE 402 Theory of Combustion**

Combustion process relating to fossil fuel heating systems. Fuel types included are natural, LP gas and oil. Venting of combustion by-products by induced draft and gravity draft. Proper combustion vent sizing utilizing equipment manufacturer approved AGA /GAMA sizing tables.

**RE 403 Psychrometrics**

Introduction to psychrometrics: defined as the study of air and its properties. The psychrometric chart is utilized for better understanding the process of conditioning air.

**RE 404L Application of Heating & A/C Lab**

Application of concepts learned in the classroom to operational HVAC equipment. Hands-on orientation involving application of mechanical and electrical concepts as they relate to residential and light commercial HVAC equipment. NEC compliance.

**RE 405 Residential Duct Design**

Introduction to duct design process. Residential duct design utilizing the Manual D duct design method published by Air Conditioning Contractors of America (ACCA).

**RE 406L Application of Controls Lab**

Application of control strategies learned in the classroom to wire and operate several types of HVAC equipment. Types of sys-

tems include heat pumps, oil, gas and electric forced air HVAC systems. Both packaged and split systems are addressed.

**RE 407 Residential Load Calculation**

Residential load calculation utilizing the Manual J load calculation method published by Air Conditioning Contractors of America (ACCA). Correct sizing of the heating and cooling equipment is covered.

**RE 408 Air Distributions & Balance**

Basics of air distribution and balancing residential and light commercial HVAC air delivery systems. Introduction to several types of air system side components such as grills, registers and diffusers. Proper application of each type of air delivery component. Introduction to equipment typically used for air balancing.

**RE 409 Oil Heat**

Application of knowledge learned in the classroom to the lab/shop environment. All laboratory/shop tasks are performed on functional oil furnaces. The scope of tasks involves electrical wiring, mechanical operation and combustion analysis of oil heating systems.

**RE 410L Oil Heat Lab**

Oil heating systems focusing on high pressure, gun-type oil burners that utilize number two fuel oil. Ignition primary control systems include both stack and cadmium cell types. Other subjects covered include fuel pump pressure regulation, fuel nozzle sizing, venting and combustion analysis.

**RE 411L Laboratory Projects/Shop Work**

Completion of several lab projects including wiring, airflow calculation and combustion analysis tasks performed on functional HVAC equipment.

**RE 501 WAC & NEC for HVAC/R**

RCW 19.28, WAC 296-46A, WAC 296-401B and articles from the NEC will be covered.

**RE 502 Commercial Systems & Components**

Use of pressure controls relating to commercial equipment including low-pressure controls, high-pressure controls and fan cycling controls. Operating pressures and temperatures required for the different applications of commercial equipment. Different refrigerant controls used in commercial refrigeration including thermal expansion valves, automatic expansion valves, capillary tubes, crankcase pressure regulators, evaporator pressure regulators, solenoid valves, head pressure control valves and pressure differential valves. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of control applications.

**RE 503 Troubleshooting Commercial Systems**

Mechanical and electrical problems that occur within commercial equipment. Recognizing symptoms, identifying the problem and formulating a solution. Proper usage of meters and instruments as well as safety procedures will be covered.

**RE 504 Electrical Theory, Circuits, Controls & Wiring Schematics**

Operations of electrical controls as applied to commercial refrigeration including relays, contactors, motor starters, fan

delays, temperature-actuated controls and a variety of switching devices. Single-phase 120/240-volt, three-phase 240/480-volt as well as Delta High Leg will be covered. Wiring and operating characteristics of a wide variety of motors will be covered. Manufacturers' electrical schematics and control strategies as applied to commercial systems. Wiring and control strategies. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of control/motor applications.

**RE 505 Commercial Compressors**

Replacement of compressors and related electrical starting components. Testing of motor windings and related electrical starting components. Interpretation of manufacture electrical performance charts under all conditions. Operations and evaluation of commercial compressors for all applications. Efficiency tests of compressors in and out of systems. Installation and proper wiring methods as specified by NEC will be covered for a wide variety of compressor applications.

**RE 506 Refrigerant Retrofits**

Replacement refrigerants used in place of the CFC refrigerant now banned by EPA. Proper techniques for oil changes and charging procedures for the alternative refrigerants. The effect of retrofits affecting motor amp draw as well as possible fan installation and electrical control adjustments to prevent motor overheating and motor overload.

**RE 507 Evaporators, Condensers & Cooling Towers**

Components that transfer heat within the refrigeration system including evaluating, servicing, maintaining, repairing and replacement of the various components. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of motor applications.

**RE 508L Laboratory Projects/Shop Work**

Hands-on evaluation and repair of a wide variety of live refrigeration equipment. Drawing of electrical diagrams and the wiring of systems to match their electrical diagram. Recognizing a symptom, identifying the problem and formulating a solution. Ability to set, adjust and evaluate a wide variety of refrigerant and electrical controls under different conditions. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of control applications.

**RE 601 WAC & NEC for HVAC/R**

RCW 19.28, WAC 296-46A, WAC 296-401B, and articles from the NEC will be covered.

**RE 602 Commercial Systems & Components**

Use of pressure controls relating to commercial equipment including low-pressure controls, high-pressure controls, oil pressure safety controls and fan cycling controls. Operating pressures and temperatures required for the different applications of commercial equipment. Different refrigerant controls used in commercial refrigeration including thermal expansion valves, automatic expansion valves, capillary tubes, crankcase pressure regulators, evaporator pressure regulators, solenoid valves, oil pumps, head pressure control valves and pressure differential valves. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of control applications.

**RE 603 Electrical Theory, Circuits, Controls & Wiring Schematics**

Operations of electrical controls as applied to commercial refrigeration including relays, contactors, motor starters, fan delays, temperature-actuated controls, and a variety of switching devices. Single-phase 120/240-volt, three-phase 240/480-volt as well as Delta High Leg will be covered. Wiring and operating characteristics of a wide variety of motors will be covered. Manufacturers' electrical schematics and control strategies as applied to commercial systems. Wiring and control strategies. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of control/motor applications.

**RE 604 Heat Load & Piping Calculations for Commercial Equipment**

Calculation of the heat gain due to infiltration and product load for medium and low temperature applications. Proper piping and installation of commercial equipment using sizing charts and piping schematics to learn the various piping techniques involved with commercial systems for medium and low temperature applications. Proper sizing of equipment based on BTUH requirements as well as voltages, amp draw and phase of electricity available. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of installation applications.

**RE 605 Commercial Ice & Ice Cream Machines**

Examination of a wide variety of ice and ice cream machines. Water-related problems as well as operational, mechanical and electrical problems involving ice and ice cream machines. Installation of well as service will be covered. Emphasis is put on the reading and interpretation of the manufactures wiring schematics. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of ice and ice cream machine applications.

**RE 606 Ultra-Low Temperature Systems**

Ultra-low temperature systems including training on cascade and compound systems. Pressures and temperatures as well as wiring methods and wiring schematics for ultra-low temperature equipment will be covered. Installation, setting and proper wiring methods as specified by NEC will be covered for a variety of low temperature applications.

**RE 607 Troubleshooting Commercial Systems**

Mechanical and electrical problems that occur with commercial equipment. Recognizing symptoms, identifying the problem and formulating a solution. Proper usage of meters and instruments as well as safety procedures will be covered.

**RE 608L Laboratory Projects/Shop Work**

Hands-on evaluation and repair of a wide variety of live refrigeration equipment, including ice machines, ice cream machines and ultra-low temperature units. Basic arc and acetylene welding will be covered. Drawing of electrical diagrams and the wiring of systems to match their electrical diagram. Recognizing a symptom, identifying the problem and formulating a solution. Ability to set, adjust and evaluate a wide variety of refrigerant and electrical controls under different conditions. Installation, setting and proper wiring methods as specified by NEC will be covered for a wide variety of control applications.

**RE 701 Direct Digital Control Systems**

Control terminology and fundamentals of computer control as applied to HVAC/R Energy Management Systems. Types of control systems: network wiring, types of inputs and outputs and system configurations. NEC compliance using Chapters 2, 3 and 9. Lab work will include: Wiring direct digital control simulators (including communication cables), component wiring of input boards, output boards, modems, sensors and controlled devices.

**RE 702 Central Fan Systems**

Types of fan systems used in large industrial facilities: including proportional motor control operation of dampers, heating valves, chilled water valves and humidification requirements. Electrical control of these systems will be covered in detail. This includes the NEC compliance, using Chapters 2, 3 and 9.

**RE 703 Pneumatic Systems**

Fundamentals of pneumatic systems: including air supply, sensors, actuators, transmitters and receiver controllers. Operation and maintenance of these components will be discussed for use in HVAC systems. Electrical wiring of end control devices, air compressors and refrigerated air dryers will be taught. This includes the NEC compliance, using Chapter 2, 3 and 9.

**RE 704 Industrial Chiller & Boiler Systems**

Industrial air conditioning systems using chilled water. Compressor types, evaporator chiller barrels, water-cooled condensers, air-purgers, absorption systems and low-pressure refrigerant. Electrical safety, diagnostics and troubleshooting; oil temperature and pressure safety controls, capacity control wiring, high-pressure refrigerant and water flow controls. Operation and maintenance of large industrial boilers including high and low pressure design, water tube and fire tube models, vertical and horizontal types. The types of fuel systems used. Boiler safety controls including low-water cutoff, high-water cutoff, water-makeup and ignition systems. This includes the NEC compliance, using Chapters 2, 3 and 9.

**RE 705 Water Treatment for HVAC Systems**

Fluid coolers, cooling towers and boilers require technicians to maintain the water quality for proper heat exchange. Metal corrosion and higher energy costs are the results of neglect of these components. Students will learn why chemical treatment is necessary, the types of chemicals used, conductivity testing, PH balance and chemical feed systems.

**RE 706 Hydronic Heating Systems**

Systems that heat with hot water or steam including boiler types, system piping, water pumps, expansion tanks and ignition control systems. Boiler control wiring including: high-limit safety controls, aquastats and pressure relief valves will be covered. Geothermal heatpumps, open and closed loop piping systems, electrical controls, troubleshooting and related campus equipment will be covered. This includes the NEC compliance, using Chapters 2, 3 and 9.

**RE 707 Residential/Commercial HVAC/R Systems Review**

Review of residential/commercial HVAC/R systems will be conducted throughout the seventh quarter. Students will be preparing for employment in companies repairing various types of HVAC/R equipment. This overview of material will reinforce

information taught in previous sections of the program. The troubleshooting, wiring and repair of these systems will be discussed. This includes the NEC compliance, using Chapters 2, 3 and 9.

#### **RE 708L Laboratory Projects**

Lab time will give the students the opportunity to apply the skills they have learned. Training equipment, lab projects, computer simulators and on-site service work will allow the student hands-on training to help reinforce the classroom teaching.

#### **RE 800 Externship**

The last quarter of the program will consist of ammonia refrigeration training or externships with potential employers.

#### **RE801 Industrial & Ammonia Plant Safety**

Safety precautions when using anhydrous ammonia for refrigeration. Safe handling and response to ammonia spills including industrial plant safety. Working with heavy equipment and high voltage equipment in an industrial facility. Safety working around three-phase 480-volt equipment. Process Safety Management (PSM), industrial plant safety plans and evacuation plans for facilities that contain 10,000 pounds or more of ammonia including code compliance, operator training, emergency response procedures and risk reduction. This includes the NEC compliance using Chapters 2, 3 and 9.

#### **RE802 Ammonia Refrigeration & Electrical Systems**

Components used in ammonia systems including direct expansion systems, brine systems, flooded systems, accumulators, evaporative condensers, hot gas defrost, water defrost and associated controls. Evaporators and components used with flooded systems including gravity flooded, liquid re-circulation systems, surge tanks, low pressure receivers, float switches, metering devices and oil draining procedures. Cold storage and controlled atmosphere storage facilities including the refrigeration systems, room temperatures, long-term storage requirements, oxygen and carbon dioxide control, humidity control and nitrogen purging. This includes the NEC compliance using Chapters 2, 3 and 9.

#### **RE803 Industrial Compressors**

Types of compressors found in Industrial HVAC/R systems: including operation and maintenance of reciprocating, centrifugal and screw compressors. Three-phase 240/480-volt systems including: Wye/Delta, part winding start and autotransformers will be covered. Disassembly and repair of industrial compressors including taking measurements using inside and outside micrometers and calipers to determine the condition of internal parts. Cylinders, crankshafts, pistons and rods along with inspection of suction and discharge valves. This includes the NEC compliance using Chapters 2, 3 and 9.

#### **RE804 Industrial Maintenance**

Maintenance requirements for industrial facilities including preventive maintenance for compressors, drive motors, water treatment and refrigeration equipment. Maintenance of evaporative condensers, defrost systems and OSHA compliance. Recognition of electrical safety hazards in and around the mechanical equipment room. This includes the NEC compliance using Chapters 2, 3 and 9.

#### **RE805 Industrial Electrical Systems**

The examination and interpretation of complex electrical circuits will be taught. Conversion of schematic to ladder diagrams and the sequence of operation of the assigned equipment. Three-phase 240/480-volt systems wiring used in the operation and safety controls associated with industrial HVAC/R systems including part winding start, Y-Delta start, across the line start and compressor-starting systems. Oil temperature and pressure safety controls. Capacity control wiring, refrigerant pressure and water flow controls. This includes the NEC compliance using Chapters 2, 3 and 9.

#### **RE806L Laboratory Projects**

Lab time will give the students the opportunity to apply the skills they have learned. Training equipment, lab projects, computer simulators and on-site service work will allow the student hands-on training to help reinforce the classroom teaching.

### **HVAC/R Technology Book and Tool List**

The book and tool list for students in the HVAC/R Program is intended to be a minimum requirement to complete the program. The prices stated do not include any mark-up for program students or any sales taxes.

**Tool and book costs are approximately \$1,970.**

#### **Book List**

**Book costs for the HVAC/R Technology Program are approximately \$590.** Books are to be purchased the first day of class. Changes may be made as more appropriate material is developed or new editions are published. Book prices may vary. The prices stated do not include any mark-up for program students or any sales taxes.

Refrigeration and Air Conditioning Technology, 5th edition, Whitman and Johnson  
Fundamentals of Residential Controls (a programmed course), Honeywell  
Copeland Service Manuals 1 through 5 and Electrical Handbook  
Basic Math for Electricity, Singer  
Tecumseh Manuals (Hermetic Compressor Data) and (Electrical Service Parts Guide Book)  
Calculator with Trig. Function  
Wiring Simplified, H.P. Richter and W.C. Schwan  
NEC Electrical Code Book (Spiral-bound version)  
Key Word Index for the NEC Code Book (Tom Henry)  
NEC Tabs for Spiral Bound Version (Tom Henry)  
1 test fee and study guide for EPA 608 certification  
Two-Year Electrical Trainee Card (Purchase at Department of Labor and Industries)  
The Job Hunting Handbook  
1 Catrax Refrigeration Student Workshop CD Software  
1 Catrax Electrical Student Workshop CD Software

## Tool List

The tools in List #1 can be purchased anywhere you choose and you may begin purchasing those tools before you start school. Please do not purchase the tools in list #2 until after you begin training. Both tool lists will be required within the first month. Tool prices may vary.

### List #1

Stubby driver combo Phillips & standard  
Phillips driver #0 & small standard  
Phillips driver #1  
Phillips driver #2  
Screwdriver 3/16" x 4"  
Screwdriver 1/4" x 4"  
Screwdriver 5/16" x 6"  
Screwdriver 3/8" x 8"  
Off-set screw driver kit  
Nut driver 1/4"  
Nut driver 5/16"  
Combination end wrench set 1/4"-3/4"  
Adjustable end wrench 10"  
Hex key (Allen) 15-piece set 1/16"-3/8"  
Slip joint pliers 10"  
Diagonal cutters 8"  
Long nose pliers 8"  
Flat file 10" (mill)  
Hacksaw frame  
Hacksaw blades 12" x 32 teeth \*order 3 each  
Hacksaw blades 12" x 18 teeth \*order 2 each  
Scratch awl  
Steel tape measure (10' x 1/2")  
Safety glasses with side shields  
Flashlight with magnet  
Batteries D cell alkaline for flashlight \*Order 2  
Pocket inspection mirror 14" extension  
Drop light with receptacle 16/3 wire x 25'  
Ball peen-hammer 8 oz.  
Wire brush  
Wire stripper/crimper  
Roll electrical tape Scotch-33  
One pair thin leather work gloves  
2 red & 2 black alligator clips with insulated boots  
Tool Box – extra large approximate dimensions are  
12½" W x 12¾" H x 21½" L  
Tool bag  
1 clipboard

### List # 2

Vise grip pinch-off tool  
Valve stem wrench  
Little "Imp" tube cutter  
Big "Imp" tube cutter  
Caliper rule 4" or longer  
Manifold  
Glycerin-filled gauge low-side  
Glycerin-filled gauge high-side  
Permeation resistant charging hoses standard fittings  
Standard hose for manifold  
Fluke 52 temperature analyzer  
Two extra temperature probes for Fluke 52 (4 total)

Leak-detecting solution (bubbles)  
UEI DL 49 clamp on ammeter  
Fluke 116 HVAC multimeter  
Alligator clip accessories for Fluke Model 116  
Robinair brass core removal tool  
J.B. piercing valves  
1 pound silver braze rod  
1/4" flare x 1/8" pipe half union  
Adapter 90-degree (Seal Right, low loss fitting)  
1 Troy oz. 56% silver solder  
Silver solder flux paste  
Small stainless steel brush  
Roll sanding cloth  
Tube bender for 1/4", 5/16", 3/8" ACR copper tubing  
Swaging – flaring kit (1/4" to 5/8")  
1/4" flare union



## Information Technology & Communication Systems (With Optional Externship)

Information Technology & Communication Systems is one of the most exciting and rewarding fields that a person can choose to enter. Graduates have achieved great success in this varied and challenging field as PC and data network technicians, wireless communications technicians, telephone technicians and alarm system technicians.

The goal of the Information Technology & Communication Systems Program is to provide graduates with the wide variety of skills necessary to obtain entry-level employment and achieve success in the industry. Throughout two years of training, the combination of classroom, lab and field projects provides students with the proper balance of theory and hands-on experience. Numerous industry certifications can be achieved with the knowledge gained through this process. The program is approved by the State of Washington as a two-year Limited Energy (06) Specialty Electrical training program

The two-year training program is divided into four six-month sections of curriculum. The first section concentrates on electronics technology with training in applied mathematics for electronics, DC and AC electronics and solid state theory, to give the student the fundamentals necessary to progress through the advanced curriculum of the next three sections. Heavy emphasis is placed on lab projects and hands-on training, which reinforces the learning process. Section two builds on the electronics theory covered in the first section with applications to operational amplifiers, digital electronics and wireless technology. Numerous hands-on lab projects allow the student to reinforce the classroom theory with practical applications. Section three covers personal computer maintenance and troubleshooting, data networking and administration. Also in section three is instruction in router configuration, VPNs, firewalls and advanced WAN technologies, T-Carriers, SONET switching and Internetworking devices. Preparation for the CompTIA A+, Net+ and Cisco CCNA enables the student to obtain these certifications. The fourth and last section exposes students to voice telephony, with installation procedures of equipment and cabling. Local loop, key systems, PBXs, computer-telephone integration, VoIP and voice mail systems are also covered. Installation standards for public address and sound systems and fire and security alarm systems are covered in accordance with the National Electrical Code and National Fire Protection Association. Installation of actual systems in a lab environment is included to give the student practical experience. Throughout the two-year training, the students prepare themselves for the workforce. Resume writing, interview skills and documentation of their experience at Perry Technical Institute in a portfolio enable the student to conduct an effective job search.

Employment opportunities continue to expand as business and industry become more dependent on information and communication systems and the Internet. There is a high demand for trained technicians who install, configure and maintain the equipment that enable us to communicate effectively.

The Information Technology & Communication Systems Program is 24 months in length (eight quarters). The student will earn 222.4 credit hours (206.3 with optional externship) which are 2,688 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	ITC 101	Applied Mathematics for Electronics . . . . .	140	14.0
	ITC 102	Electronics: DC/AC Fundamentals . . . . .	130	13.0
	ITC 104L	Laboratory Instruction . . . . .	<u>66</u>	<u>3.3</u>
			336	30.3
Quarter 2	ITC 201	Applied Mathematics for Electronics . . . . .	80	8.0
	ITC 202	Electronics: Advanced DC, AC, Solid State Circuits . . . . .	140	14.0
	ITC 204L	Laboratory Instruction . . . . .	<u>116</u>	<u>5.8</u>
			336	27.8
Quarter 3	ITC 301	Communications & Wireless Electronics. . . . .	130	13.0
	ITC 302	Digital Electronics . . . . .	80	8.0
	ITC 304L	Laboratory Instruction . . . . .	<u>126</u>	<u>6.3</u>
			336	27.3
Quarter 4	ITC 401	Communications & Wireless Electronics. . . . .	150	15.0
	ITC 402	Digital Electronics . . . . .	61	6.1
	ITC 404L	Laboratory Instruction . . . . .	<u>125</u>	<u>6.3</u>
			336	27.35
Quarter 5	ITC 501	Personal Computers & Data Networking . . . . .	186	18.6
	ITC 504L	Laboratory Instruction . . . . .	<u>150</u>	<u>7.5</u>
			336	26.1

			Clock Hours	Credit Hours
Quarter 6	ITC 602	Data Networking . . . . .	118	11.8
	ITC 603	Transmission Equipment. . . . .	118	11.8
	ITC 604L	Laboratory Instruction . . . . .	<u>100</u>	<u>5.0</u>
			336	28.6
Quarter 7	ITC 701	Basic Telephony & Cabling Standards . . . . .	80	8.0
	ITC 702	Telephone Switching Equipment. . . . .	116	11.6
	ITC 703	Employment Search: Resumes & Interview Skills . . . . .	20	2.0
	ITC 705L	Laboratory Instruction . . . . .	<u>120</u>	<u>6.0</u>
			336	27.6
Quarter 8	ITC 800	Externship Option . . . . .	336	11.2
	OR			
	ITC 802	Telephone Switching Equipment. . . . .	130	13.0
	ITC 804	Limited Energy: Alarm & Amplified Sound Systems . . . . .	80	8.0
	ITC 805L	Laboratory Instruction . . . . .	<u>126</u>	<u>6.3</u>
			336	27.3
	Program Totals . . . . .		2688	222.4
	Program Totals with Externship . . . . .		2688	206.3

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## Information Technology & Communication Systems Course Descriptions

### **ITC 101 Applied Mathematics for Electronics: Algebra**

Mathematics required to evaluate and understand the electronic circuits and equipment which will be covered in the Information Technology & Communication Systems Program.

### **ITC 102 Electronics: DC Fundamentals**

DC circuit operation and components, including test equipment and tools.

### **ITC 104L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to practical electronic circuits. The concepts of teamwork, analytical problem solving and troubleshooting are introduced. The students begin preparing a portfolio, documenting their experiences and training through the Information Technology & Communication Systems Program.

### **ITC 201 Applied Mathematics for Electronics: Algebra, Trigonometry & Logarithms**

A continuation of Quarter 1 Mathematics for Electronics. Emphasis is placed on the math necessary to understand AC circuits and decibel power calculations.

### **ITC 202 Electronics: Advanced DC, AC & Solid State Circuits**

A continuation of Quarter 1 Electronics. DC network analysis, reactive components and AC circuits are covered. Solid-state devices, Regulated DC supplies and the transistor as an amplifier and a switch.

### **ITC 204L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to practical power supply, transistor amplifiers and switches. The concepts of teamwork, analytical problem solving and troubleshooting are reinforced.

### **ITC 301 Communications & Wireless Electronics**

Integrated circuit operational amplifiers utilized as voltage amplifiers, active filters and oscillators. Radio frequency theory, noise, bandwidth and RF oscillators. AM transmitters and receivers.

### **ITC 302 Digital Electronics**

Boolean algebra and binary arithmetic provide the basis for the understanding of complex digital logic circuits. Logic gates and combinational logic.

### **ITC 304L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to practical operational amplifiers, digital and wireless RF circuits.

### **ITC 401 Communications & Wireless Electronics**

A continuation of Quarter 3 Communications & Wireless Electronics. FM transmitters and receivers, transceivers, RF transmission, propagation, waveguides, transmission lines and antenna systems are covered. RF system installation, maintenance and troubleshooting are presented to prepare the student for entry into the cellular telephone, microwave communications, wireless networking and associated fields. The students prepare and test for the FCC Radiotelephone License certification.

**ITC 402 Digital Electronics Advanced Digital Circuits**

A continuation of Quarter 3 Digital Electronics. Analysis, design and operation of digital circuits and microprocessors.

**ITC 404L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to digital and microprocessor circuits, practical FM radio circuits. Spectrum analyzers and Power/SWR measurements. Radio receiver alignment, testing and troubleshooting.

**ITC 501 Personal Computers & Data Networking**

Theory, operation, assembly and maintenance of personal computer hardware and peripheral devices. Operation of PC operating systems, including; software installation, management, utilities and troubleshooting. Introduction to local and wide area computer networks. Network types, topologies and architectures are covered to enable the student to pursue a career in network design, administration and support. Preparation for the CompTIA A+ Certification.

**ITC 504L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to computers and data networks. Assembly, upgrade and maintenance of personal computers. Software and hardware installation is accomplished which allow the student to build local and wide area networks. Field projects give the student practical field experience in data cabling and network installation.

**ITC 602 Data Networking**

A continuation of Quarter 5 Data Networks. Information and practical experience associated with local and wide area computer networks. Installation and administration of network operating systems. Network types, topologies and architectures are covered to enable the student to pursue a career in network design, administration and support. Preparation for the CompTIA Net+ Certification.



**ITC 603 Transmission Equipment**

Instruction in transmission equipment utilized by industry, which allows high volume connectivity between long distance carriers, business and Internet service providers. Router configuration, VoIP, VPNs, firewalls and advanced WAN technologies, T-Carriers, SONET switching and Internetworking devices are covered. Preparation for the Cisco CCNA Certification.

**ITC 604L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to data networks and transmission equipment. Server and workstation configuration and connection to the network is accomplished. Network administration, security and troubleshooting are covered. Router and data multiplexing equipment configuration. Voice and data integration is accomplished through the configuration of routers and telephone switching equipment into a VoIP network. Field projects give the student practical field experience in data cabling and network installation.

**ITC 701 Basic Telephony & Cabling Standards**

Preparation of the student for entry into the telephone industry. Cabling installation, telephone sets and local loop are covered. The history of the industry and industry terms are presented. National Electrical Code and industry cabling and equipment standards are covered. Data cable installer certificate obtained through industry provided certification. (Certification may occur in section 3 or 4.)

**ITC 702 Telephone Switching Equipment**

Installation, programming and troubleshooting of key system and an introduction to PBX switching equipment in a simulated business environment is accomplished. Transmission lines and long distance networks, which tie telephone switches together, are covered. Customer service concepts are presented, to enable the student to communicate effectively with the customer.

**ITC 703 Employment Search: Resumes & Interview Skills**

Designed to prepare the student to mount an effective job search. Resume preparation, interview skills and the job application process are covered as the portfolio preparation process is completed.

**ITC 705L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to industry standard telephone systems and related equipment. Hands-on experience with industry standard tools and practices is accomplished in the installation of copper and fiber optic cable systems for voice and data networks. Numerous system installation labs and off-campus field projects enable the student to apply knowledge gained in the classroom to actual field installations. Proper installation practices are covered in accordance with the National Electrical Code and industry standards.

**ITC 800 Externship**

The student has the option of obtaining practical experience in a workplace environment in lieu of the last quarter of training on campus. Externships must relate to the training that would occur in the last quarter of ITCS and must be approved by the department head.



### **ITC 802 Telephone Switching Equipment**

A continuation of Quarter 7 Telephone Switching Equipment. Installation, programming and troubleshooting of PBX switching equipment in a simulated business environment is accomplished. Voice mail is integrated into the system and the programming of system features is accomplished. The convergence of voice and data is introduced, through the development of Computer-telephone Integration (CTI) and Voice over Internet (VoIP) concepts. Customer service concepts are presented, to enable the student to communicate effectively with the customer.

### **ITC 804 Limited Energy Systems: Alarms & Amplified Sound**

Fire alarm system installation, programming and troubleshooting is covered. Proper installation practices are covered in accordance with the National Electrical Code and NFPA 72: National Fire Alarm Code. Amplified sound and speaker systems, including 70V distribution systems and intercom systems are covered.

### **ITC 805L Laboratory Instruction**

Application of the technical knowledge acquired in the classroom to industry standard telephone systems and related equipment. Hands-on experience with industry standard tools and practices is accomplished in the installation of copper and fiber optic cable systems for voice and data networks. Numerous system installation labs and off-campus field projects enable the student to apply knowledge gained in the classroom to actual telephone equipment and data network cable installations. Installation of fire alarms in a lab environment. Proper installation practices are covered in accordance with the National Electrical Code and industry standards.

## **Information Technology & Communication Systems Equipment List**

**Students have the opportunity to train on the following manufacturer's equipment:**

### **Electronics Test Equipment:**

Digital multi-meter  
Elenco oscilloscopes, signal generators and power supplies  
Hitachi oscilloscopes  
Heathkit power supplies, signal generators and curve tracer

### **Wireless Test Equipment:**

Tektronix 492 spectrum analyzer  
Elenco AM signal generators/modulators  
Hewlett Packard FM signal generators/modulators  
Motorola R 2001D communications system/spectrum analyzers  
Hewlett Packard 8921A cell site test sets  
Wiltron site master S331A SWR/RL and fault location testers  
BIRD watt meters

### **Telephone and PA Systems:**

Panasonic  
Toshiba  
Comdial  
Lucent/Avaya  
Nortel Meridian opt 11 PBX  
Nortel Norstar  
ESI  
Mitel PBX  
Duvoice voice mail  
Valcom paging  
Bogen 70V PA system

### **Personal Computers and Servers:**

Various manufacturers, including Dell, Gateway, IBM and clones. Operating systems include DOS, Win 9X, Win 2000, Win XP, Vista, Windows 2003 Server, Mac OS, Linux

### **Transmission and Network Equipment:**

Cisco routers, PIX and VPN concentrators  
T1 CSU/DSU  
Hewlett Packard switches  
3Com switches  
Cisco switches  
Fluke Quickbert T1 tester  
Fluke network analyzer  
Fluke cable certifier  
Fluke cable tester

### **Alarm Systems:**

Silent Knight 5700 Fire Alarm Control Communicator  
System sensors, pull stations and signal devices

## **Book and Tool List**

The book and tool list for students in the Information Technology & Communication Systems program is intended to be a minimum requirement to complete the program. **The total cost of books, tools, laptop and software is approximately \$3,900.**

### **Book List**

**The book cost for the ITCS program is approximately \$1,400.** Books are purchased as you enter each of the four sections of the course. Changes may be made as more appropriate material is developed or new editions are published. Book prices may vary. The price stated does not include any mark-up for program students or sales taxes.

Basic Mathematics for Electronics, Cooke and Adams  
Electronics Fundamentals, Floyd  
Solder Project Kit  
Newton's Telecom Dictionary-Harry Newton  
Modern Electronic Communication, Beasley and Miller  
FCC Test Answers, Weagant  
Digital Fundamentals, Floyd  
AM/FM Radio Kit Assembly and Instruction Manual, Elenco  
PC Novice DOS Manual  
The A+ Guide to Managing and Maintaining Your PC, Comprehensive, Andrews  
Network+ Guide to Networks, Dean  
CCNA Guide to Cisco Routing, Caudle and Cannon

### Basic Tool list

**You will need approximately \$2,000 for laptop, software and tool purchases your first week of training.** Tool prices may vary. The estimated price does not include mark-up for program students or sales tax. The following is the minimum required for the program:

Digital multi meter – solid state high impedance  
Logic probe  
Engineering programmable calculator (HP33S)  
Proto solderless breadboard and wire jumper kit  
2-16 pin integrated circuit test clips  
Pomona lead set  
Pair safety glasses  
25 watt soldering iron (Archer, Weller or equivalent) with stand  
Alternative flat tip for soldering iron  
Desoldering tool (solder sucker)  
Mechanical screw starter (approx. 10")  
2 standard screwdrivers (4 1/2" x 1/8" dia., 6" x 3/16")  
2 Philips screwdrivers (5 1/2" #1 size, 7 5/8" #2 size)  
Jeweler's screwdrivers  
Electrician's scissors  
Pair miniature diagonal cutters  
Antistatic wrist strap  
Flux brush  
Plastic screwdriver  
Pair 2" side cutters (or equivalent)  
Pair needle nose pliers  
6" adjustable wrench  
Pliers  
Nut driver set  
Tool case

### Laptop Computer and Software:

Purchase of a personal laptop computer and academic versions of software are required. Software is available at reduced prices while you are enrolled as a student. Students may purchase their computer through the vendor of their choice, including Dell.com, Toshiba.com, Sony.com and Hp.com. Staples, Office Max, Best Buy, and Office Depot are all authorized PC dealers.

### Hardware Minimum Requirements:

1 GHz processor  
60 GB HD  
512 MB RAM (1GB recommended for Vista)  
DVD drive  
USB 2.0  
WiFi 802.11b  
1GB thumb drive  
USB-serial adapter (If standard serial port not available)

### Software Requirements:

Microsoft Windows XP Operating System (Vista recommended)  
Anti virus program (regularly updated)  
Microsoft Office 2007 Standard/Student Edition  
Microsoft Visio Pro 2007

### Second Year Tool List

**You will need approximately \$600-\$700 for tool purchases for the second year of training.** These tools represent an additional purchase you will make at the beginning of the third section of training. Tool prices may vary. The estimated price does not include mark-up for program students or sales tax. The following tools are minimum required for the program.

Punch down tool (66 and 110 bits)  
Telephone test set (TS22 recommended)  
Inductive amp  
Tone tracer  
Ring cutting tool  
Modular adapter (cable test)  
Spudger  
Connector tool RJ 11/45  
110 block test adapter  
Cable tester (Wire-map)  
Cable prep tool (Data Cable)  
T-25M staple gun  
Staples T25M (pkg/1000)  
Nylon tie wraps 7" (pkg/200)  
Electrical tape  
20" soft-sided tool bag



## Instrumentation & Industrial Automation Technology

The Instrumentation & Industrial Automation Technology Program focuses on a curriculum designed to introduce students to today's world of computerized industrial automated manufacturing. The 24-month training encompasses a basic understanding of mathematics for electronics, electricity, solid state, digital devices, applied physics and calculus. Programmable logic controllers, transmitters, transducers, recorders and controllers will be used to simulate control techniques. Temperature, level, flow, and pressure are just a few of the process controls that instrumentation technicians monitor, install, troubleshoot, repair and calibrate.

Safety is an integral part of the instruction throughout the program. Regularly scheduled safety meetings are held to ensure that proper safety practices are being followed. Proper clothing including solid shoes, no sandals, long pants and full shirts with a minimum of cap sleeves must be worn. Safety glasses must be worn in lab. Unsafe practices will result in points being deducted from lab assignments and/or other disciplinary actions.

Students are encouraged to join the Instrumentation, Systems and Automation Society (ISA). The student chapter participates in chapter meetings and activities. Tours are scheduled with a variety of industries to expose students to instrumentation technicians in the work environment. The tours are required of all students enrolled in the Instrumentation & Industrial Automation Technology Program. Clock hours shown in the program outline are approximations and may be adjusted by the instructor to accommodate classroom needs. These hours may take place either in a classroom setting or as instruction in the lab area.

The goal of the Instrumentation & Industrial Automation Technology Program is to provide the resources and instruction necessary to allow students opportunities for entry-level employment as instrumentation technicians. Employment opportunities exist in almost all types of industrial product manufacturing.

The Instrumentation & Industrial Automation Technology Program is 24 months in length (six trimesters). The student will earn 138.3 credit hours which are 2,688 clock hours. Tuition is payable on a trimester basis. There are three trimesters in an academic year.

### Program Outline

			Clock Hours		Credit Hours
Trimester 1	IN 101	Math for Electronics . . . . .	137		9.1
	IN 102	Electrical Fundamentals . . . . .	112		7.5
	IN 103	Solid State Devices . . . . .	32		2.1
	IN 104L	Lab & Shop Projects . . . . .	<u>167</u>		<u>5.6</u>
			448		24.3
Trimester 2	IN 201	Electrical Fundamentals . . . . .	90		6.0
	IN 202	Solid State Devices . . . . .	40		2.7
	IN 203	Operational Amplifiers . . . . .	84		5.6
	IN 204	Physics . . . . .	46		3.1
	IN 205L	Lab & Shop Projects . . . . .	<u>188</u>		<u>6.3</u>
			448		23.7
Trimester 3	IN 301	Instrument Maintenance & Calibration . . . . .	64		4.3
	IN 302	Physics . . . . .	114		7.6
	IN 303	Calculus . . . . .	57		3.8
	IN 304L	Lab & Shop Projects . . . . .	<u>213</u>		<u>7.1</u>
			448		22.8
Trimester 4	IN 401	Instrumentation & Process Control . . . . .	90		6.0
	IN 402	Motor Control . . . . .	25		1.7
	IN 403	Calculus . . . . .	58		3.9
	IN 404L	Lab & Shop Projects . . . . .	<u>275</u>		<u>9.2</u>
			448		20.8
Trimester 5	IN 501	Instrumentation & Process Control . . . . .	30		2.0
	IN 502	Digital Fundamentals . . . . .	87		5.8
	IN 503	Programmable Logic Controllers . . . . .	90		6.0
	IN 504	Networking Fundamentals . . . . .	35		2.3
	IN 505L	Lab & Shop Projects . . . . .	<u>206</u>		<u>6.9</u>
			448		23.0

			Clock Hours	Credit Hours
Trimester 6	IN 601	Analytical Instrumentation .....	124	8.3
	IN 602	Industrial Computing .....	64	4.3
	IN 603	Employment Preparation .....	72	4.8
	IN 604L	Lab & Shop Projects .....	<u>188</u>	6.3
			448	23.7
Program Totals .....			2688	138.3

## Instrumentation & Industrial Automation Technology Course Descriptions

### **IN 101 Math for Electronics**

Numbers, addition, subtraction, multiplication and division of polynomials, equations, powers of ten, units and dimensions, special products and factoring, algebraic fractions, fractional equations, graphs, simultaneous equations, exponents and radicals, quadratic equations, angles, trigonometric functions, trigonometric tables, solution of right triangles, and trigonometric identities and equations.

### **IN 102 Electrical Fundamentals**

Electric circuits, starting with the nature of electricity, Ohm's Law and electrical calculations, conductors, insulators, resistors, series resistive circuits, parallel resistive circuits, series-parallel resistive circuits, voltage cells, batteries and capacitance.

### **IN 103 Solid State Devices**

Basic definitions, semiconductor diodes, rectifier diode circuits, basic DC power supply and transformer usage.

### **IN 104L Lab & Shop Projects**

School rules, conduct and dress code, including proper clothing requirements and the use of safety glasses, general safety practices concerning the usage and proper maintenance procedures for electrical and general shop equipment. First aid and CPR training for two-year certification; tool and book purchases; explanation of ISA; overview of basic personal computer operation including the Windows environment focusing on desktop and Explorer; and use of networks by locating computers, printers and files that are networked. MS Word will be incorporated into technical report writing skills, use of word processor for lab assignments, applying classroom theory to practical lab assignments. Safety is stressed at all times.

### **IN 201 Electrical Fundamentals**

Network analysis techniques, network theorems, magnetism, magnetic circuits, inductance, capacitance, series and parallel AC circuits, and power in AC circuits.

### **IN 202 Solid State Devices**

Semiconductor diodes, DC power supplies – single-phase, transistor as DC switch, transistor as an AC amplifier, silicon-controlled rectifiers, triac, diac and unijunction transistor and solid state transducers.

### **IN 203 Physics**

Technical mathematics and friction, equilibrium, torque and rotational equilibrium and uniformly accelerated motion are covered in this section of physics.

### **IN 204 Operational Amplifiers**

Introduction to OP Amps, first experiences with an Op Amp, inverting and non-inverting amplifiers, comparators and controls, differential, instrumentation and bridge amplifiers and integrated circuit timers.

### **IN 205L Lab & Shop Projects**

Applying classroom theory to practical lab assignments and simulators, using Microsoft Word and AutoCad. Safety is stressed at all times.

### **IN 301 Instrument Maintenance & Calibration**

Loop concepts, calibration methods, analog transmitters, transducers, controllers, process variables and ISA books are included.

### **IN 302 Physics**

Uniformly accelerated motion is covered in this section of physics. Projectile motion; Newton's Second Law; work, energy and power; impulse and momentum; simple machines; elasticity; fluids at rest; fluids in motion; temperature and expansion; quantity of heat; transfer of heat; and thermal properties of matter are covered in this section of physics.

### **IN 303 Calculus**

Analytic geometry, equations of curves and curve sketching, functions, derivatives, formulas for calculating derivatives.

### **IN 304L Lab & Shop Projects**

Applying classroom theory to practical lab assignments and simulators. Safety is stressed at all times.

### **IN 401 Instrumentation & Process Control**

Process and instrumentation diagramming, loop sheets, electrical diagramming, valves, proportional, integral and derivative controls, tuning controllers, fluid power systems and smart devices.

### **IN 402 Motor Control**

Lockout/tagout, electric symbols, ladder diagramming, contactors, single phase, three phase and DC motors, variable speed devices.

### **IN 403 Calculus**

Applications of derivatives, anti-differentiation, trigonometric functions and definite integral calculus.

### **IN 404L Lab & Shop Projects**

Applying classroom theory to practical lab assignments and simulators. Safety is stressed at all times.

### **IN 501 Instrumentation & Process Control**

Advanced control concepts, cascade, feed forward, ratio, flame safety and boiler operation.

### **IN 502 Digital Fundamentals**

**Introductory digital concepts, number systems, operations and codes, logic gates, Boolean algebra and logic simplification, combinational logic, functions of combinational logic, flip-flops and related devices.**

### **IN 503 Programmable Logic Controllers**

Overview of PLCs, PLC hardware components, fundamentals of logic, basics of PLC programming, developing PLC ladder and wiring diagrams and basic PLC functions.

### **IN 504 Networking Fundamentals**

Introduction to networks, network components and real-world networks.

### **IN 505L Lab & Shop Projects**

Applying classroom theory to practical lab assignments and simulators. Safety is stressed at all times.

### **IN 601 Analytical Instrumentation**

Applications and implementation of process analyzer systems. Chemistry as it pertains to process analyzers. Theory and operation of electrochemical and compositional process analyzers.

### **IN 602 Industrial Computing**

Configurations of distributive process control, hardware implementations and plant loop communications all utilizing control simulators. Hardware and software configurations and implementation utilizing software packaged for personal computer that provides interfaces between operator and controller. HMI software configurations on PLC controlled simulators.

### **IN 603 Employment Preparation**

Personal resume development to be used in job search. Development of a list of potential employers for setting interview schedules. Interviewing techniques and feedback from practice interviews.

### **IN 604L Lab & Shop Projects**

Applying classroom theory to practical lab assignments and simulators. Safety is stressed at all times.

## **Instrumentation & Industrial Automation Technology Book and Tool List**

The book and tool list for students in the Instrumentation & Industrial Automation Technology Program is intended to be a minimum requirement to complete the program.

**Tool and book costs will be approximately \$3,500.** Please be prepared to pay this amount within your first week of training. Your instructor will give details regarding the purchase of your tools and books on the first day of school.

### **Book List**

**The book cost for the Instrumentation & Industrial Automation Technology program is approximately \$1,100.**

Books are purchased as you enter each section of the course. Changes may be made as more appropriate material is developed. Book prices may vary. The prices stated do not include mark-up for program students or any sales taxes.

Basic Mathematics for Electronics, Cooke and Adams  
Electronics Fundamentals, Circuits, Devices and Applications, Floyd

Solid State Fundamentals, Rockis  
Digital Logical Fundamentals, Floyd  
Operational Amplifiers and Linear Integrated Circuits, Driscoll/Coughlin

TTL Data Book, 2nd Edition, Texas Instruments  
Programmable Logic Controllers, Frank D. Petruzella, Second Edition

Applied Physics, Tippens  
Industrial Measurement Books, ISA  
Calculus for Instrumentation, School Copy  
Instrumentation III Reference Manual, School Copy  
Networking, a Beginner's Guide, Hallberg  
I4 Reference Manual, School Copy  
I6 Reference Manual, School Copy  
Electrical Motor Control, Rockis/Mazur



## Tool List

Tool prices may vary. The prices stated do not include any mark-up for program students or any sales taxes. The following tools are the minimum required for this program.

- 16 pin test clips
- Carbide tipped scribe
- Set of jeweler's screwdrivers
- Safety glasses
- Digital multimeter (Fluke Model 87)
- Pencil type soldering iron (maximum of 25 watts)
- Soldering iron holder
- Desoldering tool
- Slotted screwdriver 4½" x 1/8" diameter shaft
- Slotted screwdriver 6" x 1/8" diameter shaft
- Slotted screwdriver 8" x 1/4" diameter shaft
- #1 Phillips screwdriver (zero point) 5¼" overall shaft length
- #2 Phillips screwdriver 75/8" overall shaft length
- Nut driver set
- Diagonal cutting pliers 4"
- Long nose pliers 4"
- Set combination wrenches 1/4" -3/4"
- Set small wrenches – 3/32", 1/8", 5/32", 3/16", 1/4"
- Wire stripper (must be capable of 30 awg)
- Pocket flashlight
- Pomona lead set
- Electronic calculator (Hewlett-Packard HP-33S)
- Flat tip/Phillips combination screw starter
- Anti-static wrist strap
- Crimper/stripper tool
- Perry-Cal kit
- Ball hex set 1/16" -3/8"
- Ball hex set 1.5mm-10mm
- Adjustable wrench 6"
- Adjustable wrench 10"
- Adjustable joint plier 9"
- Two padlocks – #3 Masterlock 1"-1&1/2" key lock (no combos)
- Tape measure 25'
- WSU-30M hand wire wrap/unwrap tool

Purchase of a personal laptop computer and academic versions of software are required. Software is available at reduced prices while you are enrolled as a student. Students may purchase their computer through a vendor of their choice, including: Dell.com, Toshiba.com, Sony.com, HP.com. Staples, Office Max, Best Buy and Office Depot are all authorized PC dealers.

## Laptop Computer and Accessories Approximate cost is \$850

### Recommended minimum for PC:

Pentium IV, Pentium M Processor, or equivalent.  
Windows 2000, XP, or latest Microsoft operating system  
Note: Operating system must support required software listed below.

- 1 GB RAM
- 60 GB hard drive
- USB port
- CD burner
- Carrying case
- Mouse
- USB flash drive, 256 MB (or more)

### **Software Required**

#### **Approximate cost is \$320**

- Microsoft Office (Student Edition Available)
- Autocad LT (Student Edition Available)



## Machine Technology

Perry Technical Institute's Machine Technology Program benefits from a facility with a wide variety of machine tools. Students are required to build projects during the first year of training utilizing large engine lathes; small manual and automatic lathes; milling machines; gear hob; punch presses; tool and cutter grinders; surface and cylindrical grinders; jig borers; hones; and advanced numerical controlled milling and drilling machines and lathes. Second-year students participate in a job-shop production environment, building dies and fixtures related to customer orders. Tasks involve production of parts ranging from the aerospace industry to the agriculture/food processing industry.

Students utilize computer technology in the areas of CAD (computer-aided design) and CAM (computer-aided manufacturing). Paid externships with local manufacturers have been available for students to gain valuable work experience during their second year of training.

The goal for students who successfully complete the Machine Technology Program is to be gainfully employed in an entry-level position of tool and die making, mold making, plastic injection mold making or other specialty machining occupations.

The Machine Technology Program is 24 months in length. The student will earn 181 credit hours or 165.7 credit hours (externship option) which are 2,688 clock hours. The student must maintain a 2.5 GPA in order to be eligible for an externship. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	MA 101	Shop Safety . . . . .	15	1.5
	MA 102	First Aid . . . . .	7	0.7
	MA 103	Mathematics for Machine Technology 1 . . . . .	40	4.0
	MA 104	Elementary Blueprint Reading 1 . . . . .	40	4.0
	MA 105	Machine Tool Practices 1 . . . . .	50	5.0
	MA 106L	Machine Lab . . . . .	<u>184</u>	<u>9.2</u>
			336	24.4
Quarter 2	MA 201	Mathematics for Machine Technology 2 . . . . .	40	4.0
	MA 202	Elementary Blueprint Reading 2 . . . . .	40	4.0
	MA 203	Machine Tool Practices 2 . . . . .	40	4.0
	MA 204L	Machine Lab . . . . .	<u>216</u>	<u>10.8</u>
			336	22.8
Quarter 3	MA 301	Mathematics for Machine Technology 3 . . . . .	40	4.0
	MA 302	Intermediate Blueprint Reading 1 . . . . .	40	4.0
	MA 303	Machine Tool Practices 3 . . . . .	40	4.0
	MA 304L	Machine Lab . . . . .	<u>216</u>	<u>10.8</u>
			336	22.8
Quarter 4	MA 401	Mathematics for Machine Technology 4 . . . . .	40	4.0
	MA 402	Intermediate Blueprint Reading 2 . . . . .	40	4.0
	MA 403	Machine Tool Practices 4 . . . . .	40	4.0
	MA 404L	Machine Lab . . . . .	<u>216</u>	<u>10.8</u>
			336	22.8
Quarter 5	MA 501	Geometric Dimensioning & Tolerancing 1 . . . . .	20	2.0
	MA 502	Computer Numerical Control Programming 1 . . . . .	36	3.6
	MA 503	Fundamentals of Tool Design 1 . . . . .	64	6.4
	MA 504E	Externship . . . . .	216	7.2
				336
	OR			
	MA 505L	Machine Lab . . . . .	<u>216</u>	<u>10.8</u>
			336	22.8

			Clock Hours	Credit Hours
Quarter 6	MA 601	Geometric Dimensioning & Tolerancing 2	20	2.0
	MA 602	Computer Numerical Control Programming 2	40	4.0
	MA 603	Fundamentals of Tool Design 2	40	4.0
	MA 604E	Externship	<u>236</u>	<u>7.9</u>
			336	17.9
	OR			
	MA 605L	Machine Lab	<u>236</u>	<u>11.8</u>
			336	21.8
Quarter 7	MA 701	Geometric Dimensioning & Tolerancing 3	20	2.0
	MA 702	Computer Numerical Control Programming 3	60	6.0
	MA 703	Fundamentals of Tool Design 3	20	2.0
	MA 704E	Externship	<u>236</u>	<u>7.9</u>
			336	17.9
	OR			
	MA 705L	Machine Lab	<u>236</u>	<u>11.8</u>
			336	21.8
Quarter 8	MA 801	Geometric Dimensioning & Tolerancing 4	20	2.0
	MA 802	Computer Numerical Control Programming 4	20	2.0
	MA 803	Fundamentals of Tool Design 4	60	6.0
	MA 804E	Externship	<u>236</u>	<u>7.9</u>
			336	17.9
	OR			
	MA 805L	Machine Lab	<u>236</u>	<u>11.8</u>
			336	21.8
	Program Totals without Externship Option		2688	181.0
	Program Totals with Externship Option		2688	165.7

## Machine Technology Course Descriptions

### **MA 101 Shop Safety**

Fundamental safety procedures for each group of machine tools in the shop. General shop safety considerations including proper clothing, eye protection and lifting are also covered.

### **MA 102 First Aid/CPR**

This course covers first aid and CPR instruction.

### **MA 103 Mathematics for Machine Technology**

Operations with fractions, mixed numbers and decimals as they relate to the machine trades. The topics covered are the basic math skills of addition, subtraction, multiplication and division. Calculations involving exponents, percentages, percents and rates are also covered.

### **MA 104 Elementary Blueprint Reading 1**

Fundamental skills needed to read and interpret industrial drawings. Topics covered include drawing layouts, symbols and the different drawing views used to describe machined parts.

### **MA 105 Machine Tool Practices 1**

Use of hand tools including hacksaws, files, taps and dies. Topics also include the use of measuring instruments such as

steel rules, vernier scales, micrometers and dial indicators. Precision layout techniques, drilling machine operation, drill bit sharpening and tapping are covered.

### **MA 106L Machine Lab**

Operation of drill presses, band saws, bench grinders and basic hand tools will be applied in the shop. Operations performed will include filing a block square, precision hole layout, drill bit sharpening, drilling and tapping.

### **MA 201 Mathematics for Machine Technology 2**

Customary and metric linear measuring systems as well as the fundamentals of algebra found in the machine trades. Topics include using the principles of equality and rearranging of formulas to solve common shop problems.

### **MA 202 Elementary Blueprint Reading 2**

Further develops the skills learned in Elementary Blueprint Reading 1. Topics covered include the dimensions and symbols used to call out common features such as counterbores, countersinks, fillets and spot faces. Other topics include tapers, chamfers, bevels and screw threads.



**MA 203 Machine Tool Practices 2**

Different types of lathes, their nomenclature and their operation and setup theories. Topics covered include turning, thread cutting, grooving, drilling and tapping. The operation of band saws, cold saws and abrasive saws is also covered.

**MA 204L Machine Lab**

Operation and set-up of engine lathes will be applied in the shop. Operations include turning, thread cutting, grooving, drilling and tapping. Also covered are the setups of four-jaw chucks, follower rests and steady rests.

**MA 301 Mathematics for Machine Technology 3**

Fundamentals of plane geometry. Shop problems are solved by applying the geometric principles of triangles, common polygons and circles. Other topics covered include geometric construction, area calculations and volume calculations.

**MA 302 Intermediate Blueprint Reading 1**

Advanced blueprinting topics such as orthographic projection, sectioning and special views used in industrial drawing to further define machined parts. Geometric tolerances, their datums and modifiers, along with threaded fasteners, are covered.

**MA 303 Machine Tool Practices 3**

Operation and set-up theories of the vertical milling machine. Topics covered include face milling, rough/finish milling, hole layout, drilling and tapping. Also covered are heat treating of materials, material properties and material application.

**MA 304L Machine Lab**

Operation and set-up of the vertical milling machine will be applied in the shop. Operations will include face milling, rough/finish milling, hole layout, drilling and tapping. Also covered are general machine set-ups including dialing vises and head tramming.

**MA 401 Mathematics for Machine Technology 4**

Trigonometric functions and compound angles as they apply in the machine trades. Calculations of angles and sides of right triangles, the Cartesian coordinate system, the laws of sines and cosines, and compound angle calculations are covered.

**MA 402 Intermediate Blueprint Reading 2**

As a continuation of Intermediate Blueprint Reading 1, this course further develops advanced blueprint reading skills. The topics of pipe threads, dovetails and steel identification are covered along with structural steel shapes and welding. The special considerations of blueprints for castings, worm gears and mechanical fasteners are also covered.

**MA 403 Machine Tool Practices 4**

Operation and set-up theories of horizontal milling machines and surface grinders. Milling topics covered include face milling, rough and finish milling. Surface grinding topics include selection of grinding wheels, coolant and work-holding options. The basic theories of arc, MIG and TIG welding will also be covered.

**MA 404L Machine Lab**

Operation and set-up of the horizontal milling machines and surface grinders will be applied in the shop. Milling operations will include face milling, rough and finish milling. Surface grinder operations will include block squaring and angle grinding. The fundamental operations of arc, MIG and TIG welding will be covered.

**MA 501 Geometric Dimensioning & Tolerancing 1**

Fundamental geometric dimensioning and tolerancing skills needed to interpret industrial drawings. Topics covered are material conditions, form variation and fits. Also covered are datum dimensioning, datum symbols, feature symbols and datum target symbols.

**MA 502 CNC Programming 1**

Manual programming including definitions and application of G&M codes as well as program formats for CNC turning and milling machines. Programming of lathes and milling machines with conversational-based controls is also covered.

**MA 503 Fundamentals of Tool Design 1**

Principles of tooling materials, cutting tool design, work holding principles and jig design. Economic design, break-even charts, mechanical properties of materials and heat-treating are covered. Additional topics include the fundamentals of chip formation, cutting forces, locating principles and clamping.

**MA 504E Externship**

Practical experience in a workplace environment.

**MA 505L Machine Lab**

Classroom theory will be applied to tool and cutter grinding. Topics covered are operations such as end mill, wheel cutter and form tool sharpening. Other topics covered include gear hobbing, indexing operations and machine tool rebuilding.

**MA 601 Geometric Dimensioning & Tolerancing 2**

Further develops geometric dimensioning and tolerancing skills needed to interpret industrial drawings. Topics are conventional tolerance, material conditions, datum precedence, form and profile tolerance and free state variation.

**MA 602 CNC Programming 2**

Computer-aided drafting and modeling. Includes sketching, dimensioning and blueprint formatting as well as extruding two-dimensional sketches into three-dimensional solid models.

**MA 603 Fundamentals of Tool Design 2**

Principles of fixture design. Principles such as tool types, tool positioning and tool mounting will be covered. Additional topics include the fundamentals of power presses such as hydroforming, CNC laser cutting, turret punching and forging. Also covered are metal cutting, forming and drawing, beading and culling, deep drawing and extrusion.

**MA 604E Externship**

Practical experience in a workplace environment.

**MA 605L Machine Lab**

Programming skills and set-up procedures will be used to produce parts with CNC milling and turning centers. Determining part pricing using tooling costs, material costs and time estimation are also covered.

**MA 701 Geometric Dimensioning & Tolerancing 3**

Further develops fundamental geometric dimensioning and tolerancing skills needed to interpret industrial drawings. Topics covered are tolerances of orientation, run-out and location tolerances along with combining of geometric tolerances, tangent plane symbols, coaxial features and spherical features.

**MA 702 CNC Programming 3**

Fundamental 2-D computer-aided machining. Topics include geometry formation such as lines, arcs, points and splines. Also covered are creating drill tool paths, contour tool paths and pocketing tool paths.

**MA 703 Fundamentals of Tool Design 3**

Principles of tool design. Topics covered include inspection and gauging, joining processes and modular automated tool handling. Principles such as wear allowances, coordinate measuring machines, resistance welding and riveting are covered along with tool design through 3-D modeling and simulation.

**MA 704E Externship**

Practical experience in a workplace environment.

**MA 705L Machine Lab**

Set-up procedures and machining skills will be used to produce parts with CNC programs written with CAM systems.

**MA 801 Geometric Dimensioning & Tolerancing 4**

Further develops fundamental geometric dimensioning and tolerancing skills needed to interpret industrial drawings. Topics covered are locating tolerances of fasteners, projected tolerance zones, virtual conditions, concentricity tolerance, positional tolerancing for coaxiality and symmetry.

**MA 802 CNC Programming 4**

Fundamental three-dimensional CAM. Topics include geometry formation such as surfaces and solids. Also covered are creating surface-driven and solid-driven tool paths.

**MA 803 Fundamentals of Tool Design 4**

A study of geometric dimensioning and tolerancing as applied to tool design. Topics covered are symbols and definitions, tree-plane concepts, general rules and reference.

**MA 804E Externship**

Practical experience in a workplace environment.

**MA 805L Machine Lab**

This course lets each team of students select a final project that utilizes all aspects of their machining skills. There is a strong emphasis put on teamwork and communication.

**Machine Technology  
Book and Tool List**

The book and tool list for students in the Machine Technology Program is intended to be a minimum requirement to complete the program.

**Tool and book costs are approximately \$3,375.**

**Book List 1**

**Book cost for Machine Technology 1 is approximately \$264.** Books can be purchased on a quarterly basis. Changes may be made as more appropriate material is developed or new editions are published. Book prices may vary. The prices stated do not include any mark-up for program students or any sales taxes.

- Machinery Handbook
- Blueprint Reading
- Machine Tool Practices
- Practical Shop Mathematics

**Book List 2**

**Book cost for Machine Technology 2 is approximately \$418.** Changes may be made as more appropriate material is developed or new editions are published.

- Tool Design
- Advanced Blueprint Reading
- Basic Die Making
- Blueprint Reading for Industry
- Computer Numerical Control



## Tool List

The following tool list is a minimum requirement to complete the program. Students purchase tools in the fifth or sixth week of class. Tool prices may vary. The prices stated do not include any mark-up for program students or any sales taxes.

Welding helmet  
Center drill, numbers 4 & 5  
Triangle file, single cut, 8"  
8" flat file  
Set of small Swiss files  
Adjustable wrench, 8"  
Machine apron, heavy weight cotton  
Set of fractional drill bits – fractions 1/2" by 64ths-numbers-letters  
Screwdriver, 4" electrical type  
Screwdriver, 8" square shank  
Pliers, 6"  
Machinists tool box, Kennedy #52611 or equivalent  
Rollaway toolbox, Kennedy #297 or equivalent  
Pocket sharpening hone, 3"  
Inexpensive 1" travel dial indicator  
0"-1" Micrometer, .0001", carbide faces, friction spindle, satin chrome frame; Starret EDP #50947 or equivalent  
1"-2" Micrometer, .0001", carbide faces, friction spindle, chrome frame; Starret EDP #50025 or equivalent  
Combination square set, four-piece, hardened heads, satin chrome rule, 8ths, 16ths, 32ths, 64ths, reversible protractor head; Starret EDP #51548 or equivalent  
Telescope gauge set, A, B, C satin chrome finish; Starret EDP #52616 or equivalent  
Combination drill point gauge and 3/4" hook rule; Starret EDP #50150 or equivalent  
Dial test indicator, .0005" graduation, 1.35" dial face, .030" range, dovetail mount, with attachments; Starret EDP #64610 or equivalent  
6oz. Hammer  
Scriber  
Acme tool gauge  
Center gauge, 60 degree, satin chrome finish; Starret EDP #51475 or equivalent  
Thread wires, hardened, set in pouch; Swiss Precision Instrument #98-370-0 or equivalent  
Divider, tool makers, spring type, 6", hardened tips; Starret EDP #51311 or equivalent  
Rout-A-Bur, telescoping, with extra tips; Swiss Precision Instrument #82-410-2 or equivalent  
6" flexible pocket ruler, with pocket clip; Starret EDP #56701 or equivalent  
Magnetic base, push button type, with four accessories; Starret EDP #52743 or equivalent  
Dial caliper, 6" satin chrome frame, 4-way measurement; Swiss Precision Instrument # 30-455-0 or equivalent.  
Thread pitch gauge, 30 leaves, 4 to 42 threads per inch, 11-1/2 and 27 pipe thread pitches; Starret EDP #50035

Safety glasses with side shield  
File card  
Tap set – 1/4 to 5/8 course & fine threads  
Allen set wrenches – to 3/8"  
One pair C clamps – 4"  
One pair C clamps – 6"  
One prick punch  
Center punch  
Protractor – metal-swivel arm  
Edge finder, .500 body, .200 tip hardened and ground  
Starret EDP # 53063 or equivalent  
Hacksaw  
Counter sinks  
Ball peen hammer



## Administration

**President** **Christine Coté**  
B.A. – Central Washington University

**Dean of Education** **Mike Milford**  
B.A. – University of Washington  
M.B.A. – University of Puget Sound

**Instructional Coach** **Christopher Wright**  
B.A. – Central Washington University  
M.A. – Central Washington University  
Principal Certificate – Central Washington University

**Director of Finance** **Tracy Stoffer**  
B.S. – Central Washington University  
Certified Public Accountant

**Foundation Director** **Erin Fishburn**  
B.S. – Portland State University

**Communications Coordinator** **Leanne LaBissoniere**  
B.A. – Central Washington University

**Financial Aid Director** **Carol Helms**  
A.A. – Yakima Valley Community College

**Registrar** **Jill Cope**  
B.A. – Minot State University

**IT Systems Administrator** **Jeanine Benoit**  
Certificate – Telecommunications, Perry Technical Institute

## Recruitment

**Recruiter** **Nicole Trammell**  
B.S. – Central Washington University  
Certificate – Graphics, Perry Technical Institute  
Washington State Vocational Education Certificate

**Recruiter** **Raul Luna**  
Certificate – Graphics, Perry Technical Institute  
Washington State Vocational Education Certificate

## Faculty

### Automotive Technology

**Joe Garcia – Department Head**  
Certificate – Automotive, Perry Technical Institute  
Washington State Vocational Education Certificate  
ASE Certified Automotive Instructor

**Lester Bigelow**  
Instructor  
ASE Certified Automotive Instructor

### Computer Applications & Medical Office Administration

**Lashel Church**  
Instructor  
American Academy of Professional Coders – Certified  
Professional Coder

### Computer Applications & Office Administration

**Nathan Hull – Department Head**  
B.S. – Central Washington University  
B.A. – Eastern Washington University  
Washington Residency Certificate (Secondary)  
Washington State Vocational Education Certificate  
Microsoft Certified Application Specialist

### Electrical Technology

**Mike Tucker – Department Head**  
Certificate – Electrical, Perry Technical Institute  
A.A.S. – Yakima Valley Community College  
Washington State Vocational Education Certificate  
Washington State Master Electrician Certificate

**Jon Bolin**  
Instructor  
Certificate – Electrical, Perry Technical Institute  
Washington State Journeyman Electrician Certificate

**Jim Brokaw**  
Instructor  
Certificate – Electrical, Perry Technical Institute  
Washington State General Electrical Administrator Certificate

**Forrest Buchmann**  
Instructor  
Certificate – Electrical, Perry Technical Institute  
Washington State Vocational Education Certificate  
Washington State Master Electrician Certificate

**Jason Lidke**  
Instructor  
Certificate – Electrical, Perry Technical Institute  
Washington State General Electrical Administrator Certificate

**Ron Zike**  
Instructor  
Washington State Vocational Education Certificate  
Washington State Master Electrician Certificate

## Graphic Technology

### Bill Belford - Department Head

A.A. – Yakima Valley Community College  
B.A. – Central Washington University  
Washington State Vocational Education Certificate  
W3 HTML Developer Certificate

### Shawn Hayden

Instructor  
Certificate – Graphics, Perry Technical Institute

### Jamaica Jo

Instructor  
Certificate – Graphics, Perry Technical Institute  
Washington State Vocational Education Certificate

## Heating, Ventilation, Air Conditioning & Refrigeration Technology

### Burt Ross - Department Head

Certificate – HVAC/R, Perry Technical Institute  
A.A.S. – Yakima Valley Community College  
Washington State Vocational Education Certificate  
Washington State 06A Master Electrical Specialty License

### Craig Heckart

Instructor  
Certificate – HVAC/R, Perry Technical Institute  
Washington State Vocational Education Certificate

### Dan Henderson

Instructor  
Certificate – HVAC/R, Perry Technical Institute  
A.A.S. – Yakima Valley Community College  
Washington State Vocational Education Certificate  
Washington State 06A Master Electrical Specialty License

### Marc Mitchell

Instructor  
Certificate – HVAC/R, Perry Technical Institute  
A.A.S. – Yakima Valley Community College  
Washington State Vocational Education Certificate  
Washington State 06A Master Electrical Specialty License

## Information Technology & Communication Systems

### Michael Smith – Department Head

Certificate – Instrumentation & Industrial Electronics, Perry Technical Institute  
A.A.S. – Yakima Valley Community College  
Washington State Vocational Education Certificate

### Al Bass

Instructor  
Certificate – Telecommunications, Perry Technical Institute  
A.A.S. – Yakima Valley Community College  
Washington State Vocational Education Certificate

### Andy Fischer

Instructor  
Certificate – Telecommunications, Perry Technical Institute  
Washington State Vocational Education Certificate  
A.A.S. – Telecommunications Technology, Yakima Valley Community College  
Registered Communications Distribution Designer

### Josh Phillips

Instructor  
Certificate – Telecommunications, Perry Technical Institute  
Washington State Vocational Education Certificate

## Instrumentation & Industrial Automation Technology

### Tony Nirk – Department Head

Certificate – Instrumentation, Perry Technical Institute  
A.A.S. – Pierce College Fort Steilacoom

### Larry Dagdagan

Instructor  
Certificate – Instrumentation, Perry Technical Institute  
Washington State Vocational Education Certificate

### Shon McIntyre

Instructor  
Certificate – Telecommunications, Perry Technical Institute  
Washington State Vocational Education Certificate

### Doug Oswald

Instructor  
Certificate – Instrumentation, Perry Technical Institute  
A.A. – Yakima Valley Community College  
Washington State Vocational Education Certificate

### Gerry Ries

Instructor  
Certificate – Instrumentation, Perry Technical Institute  
Washington State Vocational Education Certificate

### Dave Sylvanus

Instructor  
Certificates – Instrumentation and Machine, Perry Technical Institute  
A.A. – Yakima Valley Community College  
ISA Certified Control Technician  
Washington State Vocational Education Certificate

## Machine Technology

### Jacob Turner – Department Head

Certificate – Machine, Perry Technical Institute  
Washington State Vocational Education Certificate

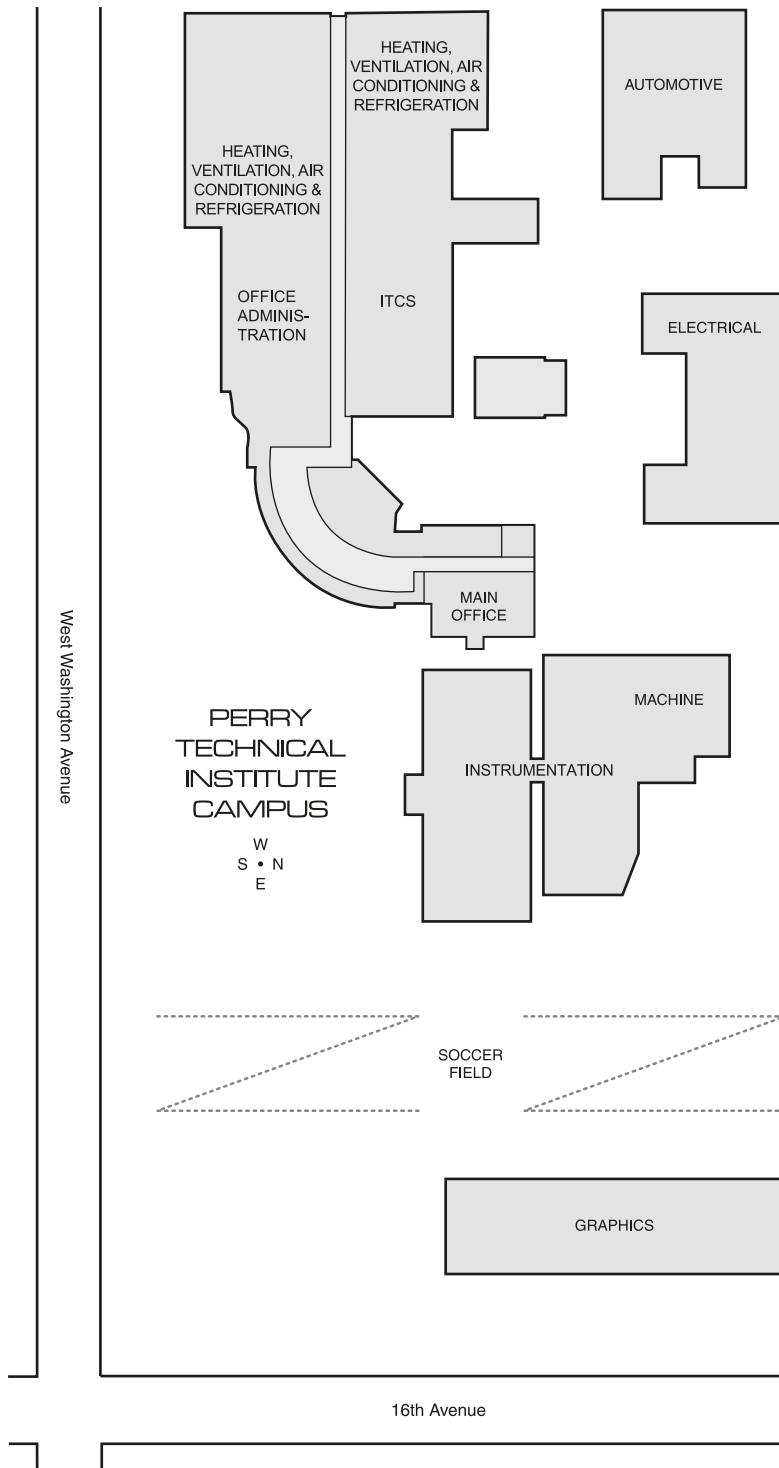
### Dan Steinmetz

Instructor  
Washington State Vocational Education Certificate

## Phone List

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