

# TABLE OF CONTENTS

## **About Perry Technical Institute**

Message from the President.....	2
Mission and Vision Statements.....	2
Purpose of the Harriet I. Perry Trust.....	2
History of Perry Technical Institute.....	3
Facilities.....	3

## **Calendar**

Academic Calendar for Quarter Classes	
2007-2008.....	4
Academic Calendar for Trimester Classes	
2007-2008.....	4

## **Admissions**

Admissions Procedures.....	5
Admissions Requirements.....	5
Credit for Previous Education.....	5

## **Academic Information**

Attendance Policy.....	5
Unexcused Absences.....	5
Excused Absences.....	5
Tardiness.....	5
Class Cut.....	5
Satisfactory Progress Policy.....	5
Definition.....	5
Probation.....	6
Repeating Quarters/Trimesters.....	6
Termination of Enrollment.....	6
Withdrawal.....	6
Dismissal.....	6
Appeal Procedure.....	6
Class/Program Cancellations.....	6
Clock Hour/Credit Hour Conversion System.....	6
Course Identification System.....	6
Lettering System.....	6
Grading.....	7
Make-up Work.....	7
Graduation Requirements.....	7
Certificate of Completion.....	7
Enrollment Capacity.....	7
Re-enrollment to Perry Technical Institute.....	7
Transcripts.....	7

## **Student Services**

First Aid/CPR.....	7
Housing.....	7
Job Placement.....	7
Student Accident Insurance.....	7
Tutoring.....	8

## **Financial Aid**

Eligibility.....	8
Satisfactory Academic Progress.....	8
Definition.....	8
Reinstatement of Aid.....	8
State Need Grant (SNG) Requirements.....	8
Withdrawals (Refunds).....	8

## **Veteran Education Benefits**

Military Active Duty Policy.....	9
Academic Standing and Re-enrollment.....	9
Refund Policy for Active Duty.....	9

## **Foundation Scholarships**

Scholarships.....	9
-------------------	---

## **Tuition and Fees**

Tuition Schedules for 2007-2008.....	9
Tuition Payment Requirements.....	10
Refund Policy.....	10
Returned Check Processing Fee.....	10

## **General Information**

Advisory Boards.....	10
Articulation Agreement with Yakima Valley Community College.....	10
Comparable Programs.....	11
Student Complaint/Grievance Procedure.....	11
Conduct Standards.....	11
Drug Free Environment Policy.....	11
Unlawful Harassment Policy.....	11
Leave of Absence.....	12
Liability.....	12
Non-Discrimination Policy.....	12
Student Records.....	12

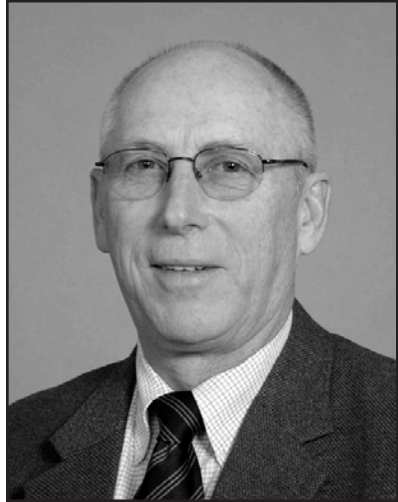
## **Programs of Study**

Automotive Technology.....	13
Program Outline.....	13
Course Descriptions.....	14
Book and Tool List.....	14
Computer Applications & Office Administration.....	16
Program Outline.....	16
Course Descriptions.....	17
Book and Tool List.....	19
Electrical Technology.....	20
Program Outline.....	20
Course Descriptions.....	21
Book and Tool List.....	24
Graphic Technology.....	26
Program Outline.....	26
Course Descriptions.....	27
Book and Tool List.....	29
HVAC/R Technology.....	30
Program Outline.....	30
Course Descriptions.....	32
Book and Tool List.....	36
Instrumentation & Industrial Automation Technology.....	38
Program Outline.....	38
Course Descriptions.....	39
Book and Tool List.....	40
Machine Technology.....	42
Program Outline.....	42
Course Descriptions.....	43
Book and Tool List.....	45
Telecommunications & Limited Energy Technology.....	46
Program Outline.....	46
Course Descriptions.....	47
Book and Tool List.....	49

## **Administration and Faculty Directory**

Administration.....	51
Faculty.....	51
Phone List.....	52

## Message from the President



J. Tuman

Welcome to Perry Technical Institute. By enrolling at Perry Tech, you are joining a proud tradition. For more than six decades, Perry Technical Institute has been equipping students with the skills they need to succeed in the workplace. The faculty and staff are proud of the reputation we have established with industry for producing skilled, motivated and dependable workers.

We measure our success by the success of our students. Placement rates for Perry's seven established programs are consistently high. Although we cannot guarantee placement, the programs are designed to give students opportunities to attain the skills demanded in the field. Employers return to campus to hire our graduates because they can count on Perry grads to have the essential combination of strong technical skills and positive work habits.

Our instructors are knowledgeable in their field of study and are current with the latest technology used in industry. Advisory committees comprised of professionals who are working in the field are instrumental in the development of the school's curriculum. If you are interested in earning an Associate of Applied Science Degree, inquire about our articulation agreement with Yakima Valley Community College which allows the college to grant credit for training in six of Perry Technical Institute's programs.

While you are a student, we are here to serve you. We want to see you succeed. When you graduate, we will follow your career and take pride in all of your accomplishments.



Dr. J. Tuman  
President  
Perry Technical Institute

---

## 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 succeed 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 city/county 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 ACCSCT. 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.

---

## 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 Telecommunications & Limited Energy Technology Program; Computer Applications & Office Administration; 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 2007-2008

### Automotive, Graphics, HVAC/R, Machine, Office Administration and Telecommunications

SUMMER QUARTER 2007	June 18 July 4 August 6-17 September 3 September 20 September 20	Summer Quarter Begins Independence Day, No Classes Summer Break Labor Day, No Classes Automotive Graduation Summer Quarter Ends
FALL QUARTER 2007	September 24 November 12 November 22-23 December 18 December 18 Dec. 19, 2007-Jan. 1, 2008	Fall Quarter Begins Veterans Day, No Classes Thanksgiving Holiday, No Classes Winter Quarter Ends Graduation Winter Break
WINTER QUARTER 2008	January 2 January 21 February 18 March 20 March 20	Winter Quarter Begins MLK Jr. Day, No Classes President's Day, No Classes Automotive Graduation Winter Quarter Ends
SPRING QUARTER 2008	March 24 March 31-April 4 May 26 June 19 June 19	Spring Quarter Begins Spring Break Memorial Day, No Classes Spring Quarter Ends Graduation, All Programs

### Electrical and Instrumentation/Industrial Automation

SUMMER TRIMESTER 2007	June 18 July 4 August 6-17 September 3 October 18 October 18	Summer Trimester Begins Independence Day, No Classes Summer Break Labor Day, No Classes Graduation Summer Trimester Ends
FALL TRIMESTER 2007/2008	October 22, 2007 November 12, 2007 November 22-23, 2007 Dec. 19, 2007-Jan. 1, 2008 January 2, 2008 January 21, 2008 February 18, 2008 February 21, 2008 February 21, 2008	Fall Trimester Begins Veterans Day, No Classes Thanksgiving Holiday, No Classes Winter Break Return to Class MLK, Jr. Day, No Classes President's Day, No Classes Graduation Fall Trimester Ends
SPRING TRIMESTER 2008	February 25 March 31-April 4 May 26 June 19 June 19	Spring Trimester Begins Spring Break Memorial Day, No Classes Spring Trimester Ends Graduation, All Programs

## Admissions

Perry Technical Institute welcomes prospective applicants who are seeking educational opportunities in one of the eight 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; submit a copy of a high school diploma or transcript, or a copy of the GED Certificate; 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. High school diploma or GED, and valid photo ID or driver's license.
2. Photocopy of above is required for completion of admissions process.
3. Completed application for admission to Perry Technical Institute with \$35 registration fee.
4. Successful completion of the entrance exam for the appropriate program.
5. 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.)
6. Payment of \$500 tuition deposit to ensure a starting date.
7. Attend mandatory student orientation.
8. Signed enrollment contract.

We enroll students based on the date in which their admissions requirements are complete. When classes reach capacity, students are automatically enrolled in 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

Attendance is mandatory. Students must maintain a minimum attendance rate of 87% for each term including unexcused and excused absences. Students who exceed five combined absences in one quarter or seven combined absences in one trimester will be placed on probation until the end of that school term. Students who exceed 13% combined absences (unexcused and/or excused) in a term may be subject to dismissal. Classes are held from 8:00 a.m. until 3:30 p.m., Monday through Friday with the exception of the Electrical Department which is in compliance with the Department of Labor and Industries to complete extended hours. Students are required to notify the school by 8:00 a.m. each day they are absent or late.

Student attendance is recorded by using an electronic time management system. Students are provided an ID scan card and are required to scan in and out each day. The cost to replace the ID scan card is \$5. Students leaving campus for an externship are also required to scan their cards at the time they leave. 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. The student will automatically be placed on probation after two days of unexcused absences in a 20-school-day period. 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. A student who is tardy three times in a twenty-school-day period will be placed on probation.

**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.

### Satisfactory 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. The school reserves the right to dismiss students who have been on probation three times.

## 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. 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. Aggressive, harassing or discriminatory acts against other students or employees
2. Failure to pay tuition
3. Unsatisfactory progress
4. Failure to follow school procedures and policies
5. Acts of theft or dishonesty
6. Three probations
7. Failure to comply with safety regulations
8. Malicious damage to school property
9. Insubordinate acts against staff or other Perry Technical Institute employees
10. Students who exceed 13% combined absences (unexcused and/or excused)

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 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 website: Perry Technical Institute, 2011 W. Washington Ave., Yakima, WA 98903, (509) 453-0374, toll-free (888) 528-8586, or 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
MA	Machine Technology
OA	Computer Applications & Office Administration
RE	Heating, Ventilation, Air Conditioning & Refrigeration Technology
TLE	Telecommunications & Limited Energy 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 credit hours for Automotive Technology  
 94.5 credit hours for Computer Applications & Office Administration  
 157.5 credit hours for Electrical Technology  
 130.5 credit hours for Graphic Technology  
 216.5 credit hours for HVAC/R Technology  
 138.5 credit hours for Instrumentation & Industrial Automation Technology  
 181 credit hours for Machine Technology  
 222 credit hours for Telecommunications & Limited Energy Technology
2. Maintain satisfactory progress with a minimum grade point average of 2.00
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
Instrumentation Technology . . . . .	132
Machine Technology . . . . .	40
Office Administration . . . . .	22
Telecommunications Technology . . . . .	96

## 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. In addition, the student must write a letter addressed to the Dean of Education which clearly states the reason for termination, the actions taken during the termination period to resolve the problem and his/her plan to successfully complete their 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 to the student population; however, information on rental units may be obtained from our Admissions Office.

### Job Placement

The school does not guarantee placement upon completion of the 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 our 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 also provides academic tutoring in order to ensure satisfactory progress through the program at the discretion of the instructor. 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 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 less than 50% of credits are completed the SNG will be denied as per the Higher Education Coordinating Board.

## 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. FSEOG
7. WA State Need 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), and 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 \$20,000 and approximately 80% 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.

## Tuition Schedule

Trimester (Electrical, Instrumentation)	Quarter (Automotive, Computer Applications, Graphics, HVAC/R, Machine, Telecom)
Summer Trimester - June 18, 2007 . . . . . \$3,138.00	Summer Quarter - June 18, 2007 . . . . . \$2,353.75
Fall Trimester - October 22, 2007 . . . . . 3,138.00	Fall Quarter - September 24, 2007 . . . . . 2,353.75
Spring Trimester - February 25, 2008 . . . . . \$3,138.00	Winter Quarter - January 2, 2008 . . . . . \$2,353.75
Summer Trimester - June 23, 2008 . . . . . 3,295.00	Spring Quarter - March 24, 2008 . . . . . 2,353.75
Fall Trimester - October 27, 2008 . . . . . 3,295.00	Summer Quarter - June 23, 2008 . . . . . 2,471.25
	Fall Quarter - September 29, 2008 . . . . . 2,471.25

Additional Costs (estimates):	Electrical	Instrumentation	Auto	Office Admin	Graphics	HVAC/R	Machine	Telecom
*Books and Tools	\$3,500.00	\$3,500.00	\$3,917.00	\$2,597.00	\$3,320.00	\$2,000.00	\$3,375.00	\$3,900.00
Field Trips	650.00	750.00	150.00	100.00	100.00		300.00	750.00
First Aid/CPR Class	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Student Accident Insurance (per term)	26.00	26.00	22.00	22.00	22.00	22.00	22.00	22.00
Technology Fee (per term)	20.00	20.00	15.00	15.00	15.00	15.00	15.00	15.00
Lab Fee (per term)	35.00			30.00	30.00	25.00		
Electrical Training Certificate	38.00							
TSA Student Membership Dues							25.00	
Industry Certification							100.00	
FCC License Exam							75.00	
CompTIA A+ Exams (2 tests, optional)							306.00	
CompTIA Net+ Exam (optional)							218.00	
Protective Clothing Rental (quarterly)			25.00					
ISA Student Membership Dues		20.00						

\*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

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

### Advisory Boards

Each program at Perry Technical Institute maintains an Advisory Committee that meets two times per year to review the program, course objectives, content and length in relationship to industry standards, appropriateness of curriculum, completion and placement rates of graduates, and adequacy of facilities and equipment. 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 provide students with the opportunity to earn an Associate of Applied Science in six courses. 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. 2. The Automotive Technology and Computer Applications & Office Administration Programs at Perry are not eligible for participation in the combined degree articulations. For additional

information, please contact the Workforce Education Division at Yakima Valley Community College at (509) 574-4744 or (509) 574-4796 or Perry Technical Institute at (509) 453-0374.

### 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 communicate first with the instructor and/or the department head informally. If the student is still unsatisfied, he/she is asked to file a PTI written complaint form and then encouraged to make an appointment with the Dean of Education 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

Schools accredited by the Accrediting Commission of Career Schools and Colleges of Technology must have a procedure and operational plan for handling student complaints. 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. 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 President and/or the Dean of Education.

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

## 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 the 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.)



## Automotive Technology

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

Shop training will occur on our 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 during their third quarter of training. In the event no externship position exists, students will complete their shop training in campus facilities.

In Automotive, 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.

Students desiring to do an externship are required to have a 3.0 GPA and maintain this grade during their externship. Students are eligible to begin an externship during the ninth month of their attendance in the Automotive Program. The student 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.

Rewarding employment opportunities are numerous and varied throughout the Northwest. The goal for students who successfully complete the 12-month course is employment as entry-level technician in the automotive industry.

The Automotive Technology Program is 12 months in length. The student attending the full 12 months on campus will earn 89 credit hours based on 1,344 clock hours. Students may do an externship dependent on satisfactory completion of coursework. 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. 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. . . . .	236	7.9
	OR			
	AU 101	Electrical Systems . . . . .	100	10.0
	AU 101L	Electrical Systems Lab . . . . .	<u>236</u>	<u>11.8</u>
			336	21.8/17.9
Quarter 2	AU201E	Externship. . . . .	236	7.9
	OR			
	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>
			336	21.8/17.9
Quarter 3	AU 301E	Externship. . . . .	236	7.9
	OR			
	AU 301	Brake Systems . . . . .	60	6.0
	AU 301L	Brake Systems Lab . . . . .	134	6.7
	AU 302	Suspension and Steering . . . . .	40	4.0
	AU 302L	Suspension and Steering Lab . . . . .	<u>102</u>	<u>5.1</u>
			336	21.8/17.9
Quarter 4	AU 401E	Externship. . . . .	196	6.5
	OR			
	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
	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 . . . . .	<u>40</u>	<u>2.0</u>
			336	23.8/20.5
		Program Totals . . . . .	1344	89.0/74.2

## Automotive Technology Program Course Descriptions

### AU 101E Externship

Practical experience in a workplace environment.

### 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, accessory systems diagnosis and repair.

### AU 101L Electrical Systems Lab

### AU 201E Externship

Practical experience in a workplace environment.

### 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, engine performance related services.

### AU 201L Engine Performance & Emissions Lab

### AU 202 Heating and Air Conditioning

Refrigerant handling and recovery procedures and certification, heating systems, refrigerant retro-fitting, control and operating systems diagnosis and repair.

### AU 202L Heating and Air Conditioning Lab

### AU 301E Externship

Practical experience in a workplace environment.

### 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, miscellaneous systems diagnosis and repair.

### AU 301L Brake Systems Lab

### AU 302 Suspension and Steering

Suspension and steering systems diagnosis and repair, wheel alignment, adjustment and repair, wheel and tire diagnosis and repair.

### AU 302L Suspension and Steering Lab

### AU 401E Externship

Practical experience in a workplace environment.

### AU 401 Basic Automobile Engine

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

### AU 401L Basic Automobile Engine Lab

### AU 402 Automatic Transmission & Powertrain

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

### AU 402L Automatic Transmission & Powertrain Lab

### AU 403 Manual Transmission & Powertrain

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

### AU 403L Manual Transmissions & Powertrain Lab

## Automotive Technology Book and Tool List

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

### Book List

**The book cost for the Automotive Technology Program is approximately \$192.** 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.**

#### Required Book:

Automotive Technology, Fourth Edition, Jack Erjavec, 2005

#### Optional Books:

Guide to Automotive Certification Examination, James G. Hughes, 2000.

Automotive Tech Certification, Don Knowles, 2001

### Tool List

**The cost of tools for the Automotive Program is \$3,125-\$3,862 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 (5ea)

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

Creoper

Digital multi-meter

Dial caliper/w 6" Ruler

Drop- light - OSHA approved

Drill – 3/8" – air with adapter

Drill bits – 29 pc. Reduced Shank, 1/16-1/2

Feeler gauges – (2)

Straight

Angled

Fender covers (2)

File set, 3 Pc., 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-w/batteries

Hack saw-w/blades

Hammers

16oz. Ball peen

48-60 oz. Hand sledge

Dead blow

Air impact ratchet-1/2" drive, inc. adapter, with

sockets –1/2"-1 1/8"

Air impact ratchet- 3/8" drive, incl. adapter

Inspection mirror

Magnetic pickup tool

Micrometer 0 –1"

Pliers

Wire crimping

Needle nose

6" slip joint

6" diagonal cutter

8" vice grip

10" or 12" 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 –1ong, med, & small: Truarc & reg.

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" to 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" to 3/8', 1/2" to 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

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

Wire brush

Rollaway tool box w/wo top box adequate to hold required tools

with reasonable room for expansion.



## Computer Applications & Office Administration

The Computer Applications & Office Administration (OA) 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 in an office or business environment.

The first two quarters prepare students to take Microsoft Office Specialist (MOS) 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 a high level of success in externship assignments. 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 94.5 credit hours, which is 1,344 clock hours. Tuition is payable on a quarterly basis. There are four quarters in an academic year.

### Computer Applications & Office Administration Program Outline

			Clock Hours	Credit Hours
Quarter 1	OA 101	Business English I	30	3.0
	OA 101L	Business English I Lab	30	1.5
	OA 105	Customer Service	12	1.2
	OA 105L	Customer Service Lab	12	.6
	OA 110	Keyboarding I	12	1.2
	OA 110L	Keyboarding I Lab	18	.9
	OA 115	Word Processing	36	3.6
	OA 115L	Word Processing Lab	42	2.1
	OA 120	Spreadsheets	30	3.0
	OA 120L	Spreadsheets Lab	36	1.8
	OA 130	Data Base	36	3.6
	OA 130L	Data Base Lab	42	2.1
			336	24.6
	Quarter 2	OA 201	Business English II	30
OA 201L		Business English II Lab	30	1.5
OA 205		Accounting	60	6.0
OA 205L		Accounting Lab	60	3.0
OA 210		Keyboarding II	12	1.2
OA 210L		Keyboarding II Lab	18	.9
OA 215		Computer Application I	24	2.4
OA 215L		Computer Application I Lab	30	1.5
OA 220		Career Planning I	18	1.8
OA 220L		Career Planning I Lab	12	.6
OA 230		Business Etiquette	18	1.8
OA 230L		Business Etiquette Lab	24	1.2
			336	24.9

			Clock Hours	Credit Hours
Quarter 3	OA 301	Business English III	30	3.0
	OA 301L	Business English III Lab	30	1.5
	OA 305	Managerial Accounting	30	3.0
	OA 305L	Managerial Accounting Lab	30	1.5
	OA 315	Computer Application II	36	3.6
	OA 315L	Computer Application II Lab	42	2.1
	OA 320	Career Planning II	15	1.5
	OA 320L	Career Planning II Lab	18	.9
	OA 325	Business Communications	24	2.4
	OA 325L	Business Communications Lab	27	1.4
	OA 330	Office Administration	24	2.4
	OA 330L	Office Administration Lab	30	1.5
			336	24.8
	Quarter 4	OA 401	PowerPoint	15
OA 401L		PowerPoint Lab	21	1.1
OA 405		Employment Preparation	36	3.6
OA 405L		Employment Preparation Lab	42	2.1
OA 410		Business Ethics	36	3.6
OA 410L		Business Ethics Lab	36	1.8
OA 415		Career Planning III	18	1.8
OA 415L		Career Planning III Lab	12	0.6
OA 430		Externship/Capstone Project	96	3.2
OA 430L		Externship/Capstone Project Lab	24	1.2
			336	20.5
		Program Totals	1344	94.5

### Computer Applications & Office Administration Course Descriptions

#### OA 101 Business English I

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 101L Business English I Lab

Directed lab with structured learning.

#### OA 105 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 105L Customer Service 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 MOS 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 bookkeeping. The objective of this course is to prepare students to take the MOS certification exam for Excel.

#### OA 120L Spreadsheets Lab

Directed lab with structured learning.

**OA 130 Data Base**

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

**OA 130L Data Base Lab**

Directed lab with structured learning.

**OA 201 Business English II (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 201L Business English II Lab**

Directed lab with structured learning.

**OA 205 Accounting**

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

**OA 205L Accounting 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.

**OA 210L Keyboarding II Lab**

Directed lab with structured learning.

**OA 215 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 215L Computer Application I 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 301 Business English III**

A concentrated review of sentence writing, this course emphasizes sentence combining, basic mechanics and paragraph writing.

**OA 301L Business English III Lab**

Directed lab with structured learning.

**OA 305 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 305L Managerial Accounting Lab**

Directed lab with structured learning.

**OA 315 Computer Application 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 315L Computer Application II Lab**

Directed lab with structured learning.

**OA 320 Career Planning II**

Students learn advanced interviewing skills, how to construct a portfolio of their work and job-seeking skills.

**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 to include decision-making and critical thinking activities.

**OA 330L Office Administration Lab**

Directed lab with structured learning.

**OA 401 Microsoft PowerPoint**

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

**OA 401L Power Point 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 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 410L Business Ethics Lab**

Directed lab with structured learning.

**OA 415 Career Planning III**

Students learn group interviewing skills, how to make group presentations and the basics of starting their own business.

**OA 415L Career Planning III Lab**

Directed lab with structured learning.

**OA 430 Externship/Capstone Project**

Students meeting externship requirements have an opportunity to work with local employers in real office environments. They will job shadow and have an opportunity to apply their classroom experience. Alternatively, students will be assigned a capstone project which will provide an opportunity to demonstrate competency in their coursework.

**OA 430L Externship/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 \$2,597. Purchase or lease your laptop computer before school begins.**

Estimated cost of a laptop computer and software is \$1170.

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 \$1705.** 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.

### 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:

500 mhz Pentium III, AMD equivalent, or higher (1.8 ghz or higher recommended)  
Windows XP OS with Service Pack 2, Windows Server(R) 2003 with SP1, or later operating system  
Display: 1024 x 768 or higher resolution monitor  
Wireless network card, internal or external  
256 mb Ram (512 mb or higher recommended)  
20 gb Hard Drive or larger  
USB Port  
CD-ROM drive (cd or dvd burner recommended)  
Carrying Case  
USB Flash Drive - 256 mb

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

Microsoft Office Professional  
QuickBooks



## Electrical Technology

The Electrical Technology Program offers students a diversified curriculum that guides an individual to become an electrician. 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, or plant electrical departments in manufacturing industries.

The Electrical Technology Program is 24 months in length (six trimesters). The student will earn 157.5 credit hours which is 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
	EL 102	Safety Orientation/School Rules . . . . .	7
	EL 103	Industrial First Aid & CPR . . . . .	7
	EL 104	Safety Meetings . . . . .	15
	EL 105	DC Fundamentals . . . . .	105
	EL 106	National Electric Code/WAC Code . . . . .	157
	EL 107	Introduction to Voltage Systems . . . . .	25
	EL 108	Wiring Practices and Switch Hookups . . . . .	69
	EL 109L	Lab and Shop Projects . . . . .	<u>50</u>
			500
Trimester 2	EL 201	AC Theory Single Phase . . . . .	100
	EL 202	AC Motors . . . . .	30
	EL 203	D.C. Motors . . . . .	30
	EL 204	NEC Review and Testing . . . . .	30
	EL 205	National Electric Code Article 430 & 440 . . . . .	35
	EL 206	Electro-Mechanical Motor Controls . . . . .	115
	EL 207	Safety Meetings . . . . .	15
	EL 208L	Lab and Shop Projects . . . . .	<u>145</u>
		500	28.5
Trimester 3	EL 301	Introduction to Digital . . . . .	45
	EL 302	Programmable Logic Controllers . . . . .	125
	EL 303L	Lab and Shop Projects . . . . .	120
	EL 304	NEC Review & Testing . . . . .	30
	EL 305	Blueprint Reading . . . . .	50
	EL 306	Code and Load Sizing Calculations . . . . .	115
	EL 307	Safety Meetings . . . . .	<u>15</u>
		500	29.3
Trimester 4	EL 401	AC Theory, Three Phase & Power Factor . . . . .	70
	EL 402	Three Phase Systems & Distribution . . . . .	60
	EL 403	Transformer Connections . . . . .	60
	EL 404	Articles 450, 500, 680 NEC . . . . .	40
	EL 405	Code & Calculations Review . . . . .	30
	EL 406	PP&L Utility Regulations & WAC Code Rules . . . . .	45
	EL 407	Conduit Bending & Wiring Practices . . . . .	40
	EL 408L	Lab & Shop Projects . . . . .	140
	EL 409	Safety Meetings . . . . .	<u>15</u>
		500	28.8

		Clock Hours	Credit Hours
Trimester 5	EL 501L	Field Wiring Experience . . . . .	600
Trimester 6	EL 601	Solid State Electronic Fundamentals . . . . .	100
	EL 602	Transistors & Operational Amplifiers . . . . .	45
	EL 603	Variable Speed Drives . . . . .	60
	EL 604	NEC Theory Review and Test . . . . .	50
	EL 605L	Lab and Shop Projects . . . . .	120
	EL 606	Safety Meetings . . . . .	15
	EL 607	Resume/ Job Search . . . . .	20
	EL 608L	Field Wiring Externship . . . . .	<u>120</u>
		530	25.9
Class & Lab Total . . . . .		2410	141.5
Field Wiring Experience Totals . . . . .		720	16.0
Program Totals . . . . .		3130	157.5

### Electrical Technology Course Descriptions

#### EL 101 Applied Electrical Math

Working fractions, factoring, transposing equations, powers of ten, working with exponents, unit conversions, trigonometric functions, and the Pythagorean theorem. Then applying these math facts to the following: Ohm's Law, The Power Formulas, along with other AC and DC Theory needing accrual circuit values solved for.

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

Requirements for safety of students and instructors to lead them into the standard practices of industry and proper use and care 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 a monthly safety committee meeting for the entire school.

#### 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 supercede 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 and Switch Hook-ups

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

#### EL 109L Lab and Shop Projects

The labs consist primarily of students doing switch hook-ups using nonmetallic 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 hookups, reversing externally reversible motors, identify four major parts of a motor, identify 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 and DC 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, determine 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 hookup, schematic diagrams of different generator configurations, connect generator windings in accordance with established practices, connecting rheostats for the purpose of controlling voltage output, and mathematical calculations to predict electrical quantities related to generators, and the costs of electrical power, efficiency and horsepower ratings.

**EL 204 NEC Code Review and Testing**

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

**EL 205 National Electrical Code Art. 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 5-hp 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, testing laboratories' requirements for short-circuit and ground-fault protection, and the requirements for air-conditioners.

**EL 206 Electro-Mechanical Motor Controls**

The principals 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.

**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 a monthly safety committee meeting for the entire school.

**EL 208L Lab and Shop Projects**

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

**EL 301 Introduction to Digital**

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

**EL 302 Programmable Logic Controllers**

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

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 PLC's. 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 and Shop Projects**

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

**EL 304 NEC review and testing**

Code evaluation, of previously covered code articles.

**EL 305 Blueprint Reading**

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

**EL 306 Code and Load Sizing Calculations**

Covering code article 220 & 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 a monthly safety committee meeting for the entire school.

**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 and 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, and 680 NEC**

NEC Article 450 - Code requirements for sizing of transformers 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 Code and Calculations Review**

Evaluation of previously covered code and wire sizing calculations.

**EL 406 PP&L Requirements, WAC and 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 the required forms and documents that PP&L utilizes. 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 and Shop Projects**

The student will practice applied wiring techniques in various hands on exercises and labs including but no 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 a monthly safety committee meeting for the entire school

**EL 501L Field Wiring Experience**

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.

**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 and Test**

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

**EL 605L Lab and 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 a monthly safety committee meeting for the entire school.

## EL 607 Resume/Job Search

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

## EL 608L Field Wiring Externship

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.

## 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 as 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 that might be 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 8-Pocket Extra Capacity Tool Pouch  
2" Tool Pouch Belt  
1"x 6" Auger Bit  
Stubby Screwdriver (1-1/2" SQ. Shank) Standard  
Stubby Screwdriver (1-1/2" SQ. Shank) #2 Phillips  
4" Sq. Shank Screwdriver Standard  
6" Sq. Shank Screwdriver Standard  
8" Sq. 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  
Lg. folding Allen Wrench Set (3/16" - 3/8")  
Sm. 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" thru 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  
Lock Out - Tag Out 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 for 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 18-month 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 the opportunity to network with industry professionals, participate in award competition, 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 130.5 credit hours, which is 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 22.4 credit hours, which is 672 clock hours. Tuition is payable on a quarterly basis. There are four (4) quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	GA 101	Mac/Windows Platform	10	1.0
	GA 101L	Mac/Windows Platform Lab	40	2.0
	GA 102	Illustration I	20	2.0
	GA 102L	Illustration I Lab	40	2.0
	GA 105	Design I	30	3.0
	GA 105L	Design I Lab	78	3.9
	GA 106	Imaging	40	4.0
	GA 106L	Imaging Lab	78	3.9
			336	21.8
Quarter 2	GA 204	Photography I	20	2.0
	GA 204L	Photography I Lab	40	2.0
	GA 206	Vector Graphics	30	3.0
	GA 206L	Vector Graphics Lab	78	3.9
	GA 209	Web Site Design and Development I	30	3.0
	GA 209L	Web Site Design and Development I Lab	58	2.9
	GA 212	Employment Preparation	20	2.0
	GA 212L	Employment Preparation Lab	60	3.0
			336	21.8
Quarter 3	GA 302	Illustration II	20	2.0
	GA 302L	Illustration II Lab	40	2.0
	GA 303	Sign Design I	30	3.0
	GA 303L	Sign Design I Lab	78	3.9
	GA 307	Prepress and Imposition	20	2.0
	GA 307L	Prepress and Imposition Lab	60	3.0
	GA 309	Web Site Design and Development II	30	3.0
	GA 309L	Web Site Design and Development II Lab	58	2.9
			336	21.8

			Clock Hours	Credit Hours
Quarter 4	GA 400E	Externship	236	7.8
	GA 402	Illustration III	20	2.0
	GA 402L	Illustration III Lab	40	2.0
	GA 403	Sign Design II	30	3.0
	GA 403L	Sign Design II Lab	78	3.9
	GA 404	Photography II	20	2.0
	GA 404L	Photography II Lab	40	2.0
	GA 406	Publishing	30	3.0
	GA 406L	Publishing Lab	78	3.9
				336
Quarter 5	GA 500E	Externship	236	7.8
	GA 504	Photography III	20	2.0
	GA 504L	Photography III Lab	40	2.0
	GA 508	Print Design I	30	3.0
	GA 508L	Print Design I Lab	78	3.9
	GA 509	Web Site Design and Development III	30	3.0
	GA 509L	Web Site Design and Development III Lab	58	2.9
	GA 510	Advertising	20	2.0
	GA 510L	Advertising Lab	60	3.0
				336
Quarter 6	GA 600E	Externship	236	7.8
	GA 602	Illustration IV	20	2.0
	GA 602L	Illustration IV Lab	40	2.0
	GA 603	Sign Design III	30	3.0
	GA 603L	Sign Design III Lab	78	3.9
	GA 608	Print Design II	30	2.0
	GA 608L	Print Design II Lab	60	3.0
	GA 611	Portfolio Development	20	3.0
	GA 611L	Portfolio Development Lab	58	2.9
				336
Program Totals			2016	130.5
Externship Totals			2016	118.5

### Graphic Technology Course Descriptions

#### GA 101 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 101L Mac/Windows Platform Lab

#### GA 102 Illustration I

Introduction and application of digital software and techniques.

#### GA 102L Illustration I Lab

#### GA 105 Design I

Introduction to design basics, drawing, sketching, shading, composition using shapes, template techniques, typography, color theory.

#### GA 105L Design I Lab

#### GA 106 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 106L Imaging Lab

#### GA 204 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 204L Photography I Lab

#### GA 206 Vector Graphics

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

#### GA 206L Vector Graphics Lab

**GA 209 Web Site Design and Development I**

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

**GA 209L Web Site Design and Development I Lab****GA 212 Employment Preparation**

Development of resume and cover letter. Exploration of employment search resources, employment application, interview techniques, job shadows and externships and small business planning.

**GA 212L Employment Preparation Lab****GA 302 Illustration II**

Study and application of design layout, composition and techniques.

**GA 302L Illustration II Lab****GA 303 Sign Design I**

Introduction and application of digital software for design. Visual study of personal and corporate logos and creative text.

**GA 303L Sign Design I Lab****GA 307 Prepress and 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 307L Prepress and Imposition Lab****GA 309 Web Site Design and Development II**

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

**GA 309L Web Site Design and Development II Lab****GA 400E Externship**

Practical experience in a workplace environment.

**GA 402 Illustration III**

Study and application using intermediate techniques.

**GA 402L Illustration III Lab****GA 403 Sign Design II**

Introduction to the sign industry history, terminology, regulations, materials, vinyl graphics industry software and equipment. Study of indoor and outdoor advertising media philosophy, design and ethics. Study of type construction, proportion, spacing, scaling and layout.

**GA 403L Sign Design II Lab****GA 404 Photography II**

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

**GA 404L Photography II Lab****GA 406 Publishing**

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

**GA 406L Publishing Lab****GA 500E Externship**

Practical experience in a workplace environment.

**GA 504 Photography III**

Advanced studio techniques. Students pursue independent photo projects.

**GA 504L Photography III Lab****GA 508 Print Design I**

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

**GA 508L Print Design I Lab****GA 509 Web Site Design and 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 509L Web Site Design and Development III Lab****GA 510 Advertising**

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

**GA 510L Advertising Lab****GA 600E Externship**

Practical experience in a workplace environment.

**GA 602 Illustration IV**

Content covered in all previous courses is reviewed. Independent projects applying techniques learned earlier.

**GA 602L Illustration IV Lab****GA 603 Sign Design III**

Advanced application of vinyl sign technology using proprietary software and equipment. Study of sign design illustration, its application and the use of new technology in the commercial sign Industry.

**GA 603L Sign Design III Lab****GA 608 Print Design II**

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

**GA 608L Print Design II Lab****GA 611 Portfolio Development**

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

**GA 611L Portfolio Development Lab****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 \$3,320. 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 \$50 for books 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 \$430.** Changes may be made as more appropriate material is developed or new editions are published.

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

**Tool List**

**Art Supplies:** A list will be provided to the student of needed items. **Approximate cost is \$100.**

**Camera & 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  
 256 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:

Pentium IV Processor, AMD Equivalent, or higher  
 Windows XP OS w/ Service Pack 2, or Vista OS  
 1gb RAM (2gb recommended)  
 64mb video RAM (128mb or higher recommended)  
 40gb Hard Drive or larger  
 USB Port  
 DVD Burner  
 Carrying Case  
 Pen/Mouse Drawing Tablet  
 USB Flash Drive, (Mac & PC compatible) 256 mb

Minimum System Requirements for Mac:

G4, G5 or Intel-based Macintosh Processor  
 OS X 10.4.8 or higher  
 1gb RAM (2gb recommended)  
 64mb video RAM (128mb or higher recommended)  
 40gb Hard Drive or larger  
 USB Port  
 DVD Burner  
 Carrying Case  
 Pen/Mouse Drawing Tablet  
 USB Flash Drive, (Mac & PC compatible) 256 mb

**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.**

Adobe Creative Suite Design Premium  
 CorelDRAW  
 Corel Painter

**Expendable Supplies Kit**

Computer disks, business cards, Web domain and hosting, batteries, etc. **Approximate cost is \$15 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 60% 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 six different areas, giving them competitive advantages in the employment market. Externships are encouraged with employers during the last three months of training.

The HVAC/R Technology is 24 months in length. The student will earn 216.6 credit hours (class option) or 198.5 credit hours (externship option) which is 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 E.P.A. Regulations	7	0.7
	RE 106	The Refrigeration System, Electrical & Mechanical	60	6.0
	RE 107	Equipment Retrofit of Oils and 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	0.8
	RE 112L	Laboratory Projects/Shop Work	<u>128</u>	<u>6.4</u>
			336	27.2
Quarter 2	RE 200	The Refrigeration System, Electrical/Mechanical	40	4.0
	RE 201	Interpreting Schematic and 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 and Equipment	30	3.0
	RE 303	Proper Use and 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 and 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 and A/C Lab	75	3.8
	RE 311L	Application of Controls Lab	<u>25</u>	<u>1.3</u>
			336	25.7

			Clock Hours	Credit Hours
Quarter 4	RE 400	Electrical Diagrams	20	2.0
	RE 401	Heating and Cooling Equipment	20	2.0
	RE 402	Theory of Combustion	20	2.0
	RE 403	Psychrometrics	20	2.0
	RE 404L	Application of Heating and 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 and 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	25.3
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 and 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	RE 800	Externship	336	11.2
	OR			
	RE 801	Ammonia Industrial Compressors	50	5.0
	RE 802	Ammonia Industrial Electrical Systems	50	5.0
	RE 803	Industrial & Ammonia Plant Safety	40	4.0
	RE 804	Ammonia Refrigeration & Electrical Systems	70	7.0
	RE 805	Ammonia Industrial Plant Maintenance	40	4.0
	RE 806L	Laboratory Projects	<u>86</u>	<u>4.3</u>
			336	29.3
	Program Totals		2688	198.5/216.6



## HVAC/R Technology Course Descriptions

### RE 101 Electrical & Tool Safety

Safety topics for both the classroom & shop environment. Specific tools, procedures & 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, Ohms Law, Watts Law/Power, areas and volume.

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

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

### RE 105 Refrigerant EPA Regulations

The rules and regulations concerning the handling of refriger-ants. Upon successful completion, student will become univer-sally certified under the 608 provisions of the Environmental Protection Agency.

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

Four main components of a mechanical compression refrigera-tion system, each of their functions within the system including the pressures and temperatures associated with each com-ponent, 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 and 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 combi-nation electrical circuits, operation of electrical components, 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 & Kelvin), absolute and gage pres-sures, pressure enthalpy diagrams, function and operation of compressor, evaporator, condenser and metering device.

### RE 109 Electrical Fundamentals

Electrical safety, Atomic structure, electron flow theory, voltage current resistance relationships (Ohms law), Electrical: heating, operating and safety controls heat and magnetism produced by

current flow, electrical circuits, series and parallel circuits, resis-tive 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 elec-trical 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 equip-ment. 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 elec-trical 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, 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 op-eration of these controls so as to allow students to apply this knowledge on various equipment types. 120, 240 & 24 volt controls. Introduction to residential forced air electric furnaces and controls. Topics include maintenance, airflow calculations, temperature rise, reading and developing wiring diagrams. Operation & troubleshooting of electric heat sequencers, trans-formers, 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 fol-lowing: Emphasis on electrical measurements for troubleshoot-ing 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, troubleshoot-ing 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 and Equipment

Proper use and application of tools utilized in the HVAC trade. Examples of tools would include refrigerant recovery equip-ment, 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 elec-tronic air cleaners. Humidification and types of humidifiers are covered as well.

### RE 305 Electric Motors and 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 and 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 protec-tion controls and safeties. NEC compliance, Article 725 and Table 11A.

### RE 307 Heating and 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 and 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 intro-duced and applied to electrical diagrams. NEC compliance using Article 300

### RE 401 Heating and Cooling Equipment

Residential and light commercial HVAC equipment, both pack-aged 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 and 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 Distribution and 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 and 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 volts as well as Delta High Leg will be covered. Wiring and operat-

ing 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 and 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 volts 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 and 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 and Ice Cream Machines**

Examination of 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 (8) of the program will consist of ammonia refrigeration training or externships with their potential employers.

### RE 801 Ammonia 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.

### RE 802 Ammonia 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, 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.

### RE 803 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 phases 480-volt equipment. Process Safety Management (PSM), Industrial plant safety plans and evacuation plans for facilities that contain 10,000 # 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.

### RE 804 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.

### RE 805 Ammonia Industrial Plant 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.

### RE 806L 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 \$2,000.

### Book List

Book costs for the HVAC/R Technology Program are approximately \$570. 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 & study guide for E.P.A. 608 certification
- 2 Year Electrical Trainee Card (Purchase at Dept. of Labor and Industries)
- The Job Hunting Handbook
- 1 Cattrax Refrigeration student workshop CD software
- 1 Cattrax 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. The prices stated do not include any mark-up for program students or any sales taxes.**

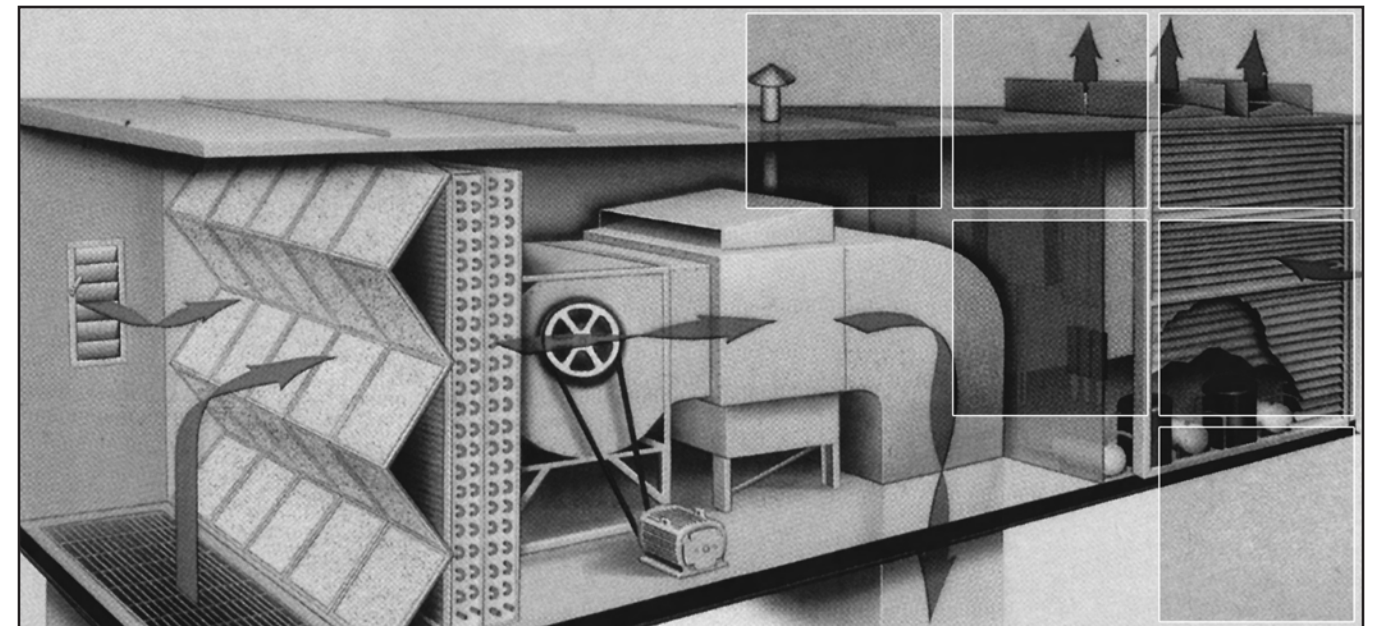
#### List #1

- 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 w/side shields
- Flashlight with Magnet
- Batteries D Cell Alkaline for flashlight \*Order 2
- Pocket Inspection Mirror 14" extension
- Drop Light w/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 W/insulated boots
- Tool Box - Extra Large **Approximate Dimensions are 12 1/2"W x 12 3/4"H x 21 1/2 L**
- Tool Bag
- 1 Clip Board

#### 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)
- 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



## 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 are required to 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 trade shows. 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 an opportunity for entry-level employment as Instrumentation Technicians. Employment opportunities exist in almost all types of industrial product manufacturers.

The Instrumentation & Industrial Automation Technology Program is 24 months in length (six trimesters). The student will earn 138.4 credit hours which is 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 . . . . .	141	9.4
	IN 102	Electrical Fundamentals . . . . .	124	8.3
	IN 103	Solid State Devices . . . . .	16	1.1
	IN 104L	Lab and Shop Projects . . . . .	<u>167</u>	<u>5.6</u>
			448	24.4
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 and Shop Projects . . . . .	<u>188</u>	<u>6.3</u>
			448	23.7
Trimester 3	IN 301	Instrument Maintenance and Calibration . . . . .	64	4.3
	IN 302	Physics . . . . .	114	7.6
	IN 303	Calculus . . . . .	57	3.8
	IN 304L	Lab and Shop Projects . . . . .	<u>213</u>	<u>7.1</u>
			448	22.8
Trimester 4	IN 401	Instrumentation and Process Control . . . . .	90	6.0
	IN 402	Motor Control . . . . .	25	1.7
	IN 403	Calculus . . . . .	58	3.9
	IN 404L	Lab and Shop Projects . . . . .	<u>275</u>	<u>9.2</u>
			448	20.8

			Clock Hours	Credit Hours
Trimester 5	IN 501	Instrumentation and 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 and Shop Projects . . . . .	<u>206</u>	<u>6.9</u>
			448	23.0
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 and Shop Projects . . . . .	<u>188</u>	<u>6.3</u>
			448	23.7
PROGRAM TOTALS . . . . .			2688	138.4

## 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, trigonometric identities and equations, elementary plane vectors, periodic functions, and phasor algebra.

### IN 102 Electrical Fundamentals

Electric circuits, starting with the nature of electricity, Ohm's Law and electrical calculations, conductors, insulators, and 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 and 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, 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 and 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 and 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 and Shop Projects

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

### IN 401 Instrumentation and 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

Lock-out-tag-out, 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 and Shop Projects

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

### IN 501 Instrumentation and Process Control

Advanced control concepts cascade, feedforward, 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 and 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 and 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 Jeweler's Screwdriver  
Safety Glasses  
Digital Multimeter (Fluke Model 87)

Pencil Type Soldering Iron (Maximum of 25 Watts)  
Soldering Iron Holder  
Desoldering Tool  
Slotted Screwdriver 4 1/2" x 1/8" Dia. Shaft  
Slotted Screwdriver 6" x 1/8" Dia. Shaft  
Slotted Screwdriver 8" x 1/4" Dia. Shaft  
#1 Phillips Screwdriver (Zero Point) 5 1/4" Overall Shaft Length  
#2 Phillips Screwdriver 7 5/8" 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

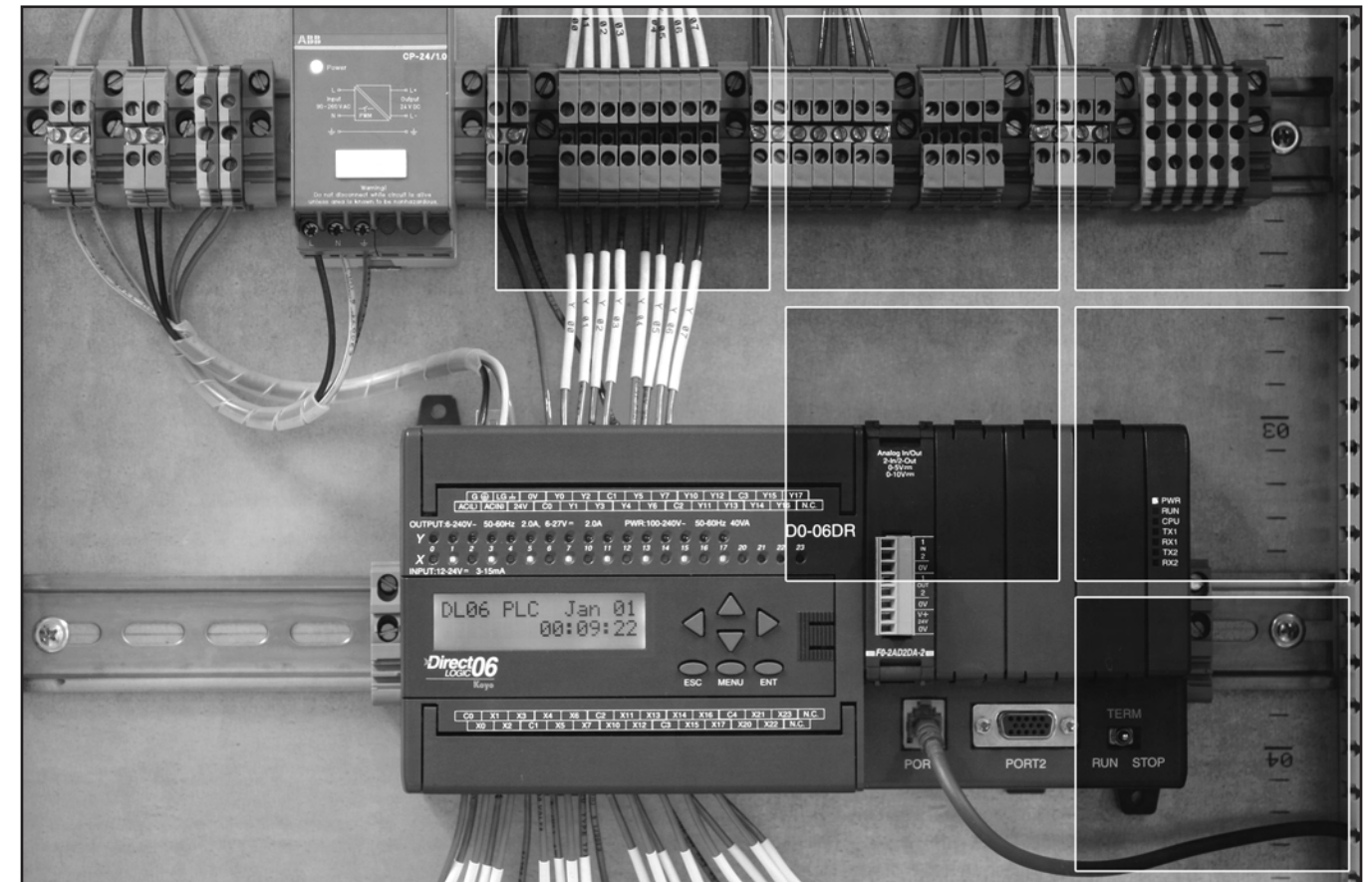
#### Recommended minimum for PC:

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  
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 borer, 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 areas of CAD (computer aided design) and CAM (computer aided manufacturing). Paid externships have been available for students to gain valuable work experience during their second year of training with local area manufacturers.

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 which is 2,688 clock hours or 2,688 clock hours and 165.5 hours if an externship is served in lieu of completing the lab on campus. 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 504E	Externship	216	7.2
	OR			
	MA 501	Geometric Dimensioning and 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 505L	Machine Lab	<u>216</u>	<u>10.8</u>	
			336	22.8/19.2
Quarter 6	MA 605E	Externship	236	7.9
	OR			
	MA 601	Geometric Dimensioning and Tolerancing 2	20	2.0
	MA 602	Computer Numerical Control Programming 2	20	2.0
	MA 603	Fundamentals of Tool Design 2	40	4.0
	MA 604	Design of Cutting Tools	20	2.0
MA 605L	Machine Lab	<u>236</u>	<u>11.8</u>	
			336	21.8/17.9

			Clock Hours	Credit Hours
Quarter 7	MA 704E	Externship	236	7.9
	OR			
	MA 701	Geometric Dimensioning and 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 705L	Machine Lab	<u>236</u>	<u>11.8</u>
			336	21.8/17.9
Quarter 8	MA 804E	Externship	236	7.9
	OR			
	MA 801	Geometric Dimensioning and 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 805L	Machine Lab	<u>236</u>	<u>11.8</u>
			336	21.8/17.9
Program Totals			2688	181.0/165.5

### 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.

Reading 1. Topics covered include the dimensions and symbols used to callout common features such as counterbores, countersinks, fillets, and spot faces. Other topics include tapers, chamfers, bevels, and screw threads.

#### MA 102 First-Aid

This course covers first aid and CPR instruction.

#### 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 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 204L Machine Lab

Operation and setup 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 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 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 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 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 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 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 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 304L Machine Lab

Operation and setup 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 setups including dialing vises and head tramming.

#### MA 202 Elementary Blueprint Reading 2

Further develops the skills learned in Elementary Blueprint

**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 setup 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 setup 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 and 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, workholding 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 endmill, wheel cutter, and form tool sharpening. Other topics covered include gear hobbing, indexing operations, and machine tool rebuilding.

**MA 601 Geometric Dimensioning and 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 604 Design of Cutting Tools**

Concepts of the basic requirements of a cutting tool, mechanics, consideration for metal cutting, including drills, reamers, milling cutters, and taps.

**MA 605E 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 and Tolerancing 3**

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

**MA 702 CNC Programming 3**

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

**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 3D 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 computer aided machining (CAM) systems.

**MA 801 Geometric Dimensioning and 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 3D computer-aided machining (CAM). Topics include geometry formation such as surfaces and solids. Also covered are creating surface-driven and solid-driven toolpaths.

**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 equiv.  
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 Pean Hammer

## Telecommunications & Limited Energy Technology

Telecommunications & Limited Energy Technology is one of the most exciting and rewarding fields that a person can choose to enter. Graduates have achieved great success as PC and Data Network Technicians, Telephone Technicians, Wireless Communications Technicians and Alarm System Technicians in this varied and challenging field.

The goal of the Telecommunications & Limited Energy Technology Program is to provide graduates with the wide variety of skills necessary to obtain entry-level employment and achieve success in the industry. Throughout the 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. This 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 to 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 of 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 accomplished 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 telecommunications, information 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 Telecommunications & Limited Energy Technology program is 24 months in length (eight quarters). The student will earn 222 credit hours which is 2688 clock hours. Tuition is payable on a quarter basis. There are four quarters in an academic year.

### Program Outline

			Clock Hours	Credit Hours
Quarter 1	TLE 101	Applied Mathematics for Electronics . . . . .	140	14.0
	TLE 102	Electronics: DC/AC Fundamentals . . . . .	130	13.0
	TLE 104L	Laboratory Instruction . . . . .	<u>66</u>	<u>3.3</u>
			336	30.3
Quarter 2	TLE 201	Applied Mathematics for Electronics . . . . .	80	8.0
	TLE 202	Electronics: Advanced DC, AC, Solid State Circuits . . . . .	140	14.0
	TLE 204L	Laboratory Instruction . . . . .	<u>116</u>	<u>5.8</u>
			336	27.8
Quarter 3	TLE 301	Communications and Wireless Electronics . . . . .	130	13.0
	TLE 302	Digital Electronics . . . . .	80	8.0
	TLE 304L	Laboratory Instruction . . . . .	<u>126</u>	<u>6.3</u>
			336	27.3
Quarter 4	TLE 401	Communications and Wireless Electronics . . . . .	150	15.0
	TLE 402	Digital Electronics . . . . .	61	6.1
	TLE 404L	Laboratory Instruction . . . . .	<u>125</u>	<u>6.25</u>
			336	27.35
Quarter 5	TLE 501	Personal Computers and Data Networking . . . . .	186	18.6
	TLE 504L	Laboratory Instruction . . . . .	<u>150</u>	<u>7.5</u>
			336	26.1

			Clock Hours	Credit Hours
Quarter 6	TLE 602	Data Networking . . . . .	118	11.8
	TLE 603	Transmission Equipment . . . . .	118	11.8
	TLE 604L	Laboratory Instruction . . . . .	<u>100</u>	<u>5.0</u>
			336	28.6
Quarter 7	TLE 701	Basic Telephony and Cabling Standards . . . . .	80	8.0
	TLE 702	Telephone Switching Equipment . . . . .	116	11.6
	TLE 703	Employment Search: Resumes and Interview Skills . . . . .	20	2.0
	TLE 705L	Laboratory Instruction . . . . .	<u>120</u>	<u>6.0</u>
			336	27.6
Quarter 8	TLE 802	Telephone Switching Equipment . . . . .	130	13.0
	TLE 804	Limited Energy: Alarm and Amplified Sound Systems . . . . .	80	8.0
	TLE 805L	Laboratory Instruction . . . . .	<u>126</u>	<u>6.3</u>
			336	27.3
PROGRAM TOTAL . . . . .			2688	222.0

## TELECOMMUNICATIONS & LIMITED ENERGY TECHNOLOGY Course Descriptions

### TLE 101 Applied Mathematics for Electronics: Algebra

Mathematics required to evaluate and understand the electronic circuits and equipment which will be covered in the Telecommunications & Limited Energy Technology Program.

### TLE 102 Electronics: DC Fundamentals

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

### TLE 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 Telecommunications & Limited Energy Technology Program.

### TLE 201 Applied Mathematics for Electronics: Algebra, Trigonometry and Logarithms

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

### TLE 202 Electronics: Advanced DC, AC and 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.

### TLE 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.

### TLE 301 Communications and 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.

### TLE 302 Digital Electronics

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

### TLE 304L Laboratory Instruction

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

### TLE 401 Communications and Wireless Electronics

A continuation of Quarter 3 Communications and 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 job entry into the cellular telephone, microwave communications, wireless networking and associated fields. The students prepare and test for the FCC Radiotelephone License certification.

### TLE 402 Digital Electronics Advanced Digital Circuits

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

### TLE 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.



#### **TLE 501 Personal Computers and 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.

#### **TLE 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.

#### **TLE 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.

#### **TLE 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, VPN's, firewalls and advanced WAN technologies, T-Carriers, SONET switching and Internetworking devices are covered. Preparation for the Cisco CCNA Certification.

#### **TLE 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.

#### **TLE 701 Basic Telephony and 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)

#### **TLE 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.

#### **TLE 703 Employment Search: Resumes and 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.

#### **TLE 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.

#### **TLE 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.

#### **TLE 804 Limited Energy Systems: Alarms and 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.

#### **TLE 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.

### **TELECOMMUNICATIONS AND LIMITED ENERGY TECHNOLOGY 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  
Silent Knight 5104 Signal System Controller  
ESL 1500 Fire Alarm Control  
System Sensors, Pull Stations and Signal Devices

### **TELECOMMUNICATIONS AND LIMITED ENERGY TECHNOLOGY Book and Tool List**

The book and tool list for students in the Telecommunications & Limited Energy Technology 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 Telecommunications Technology program is approximately \$1,200. Books are purchased as you enter each of the six 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  
Guide To Telecommunications Technology, Dean  
Telecommunications Wiring, Herrick & McKim  
Cable and Connector Lab Kit

#### **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:

##### **Tools:**

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)  
Jewelers 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  
 Soldering Projects

**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  
 1 GB Thumb Drive  
 USB-Serial Adapter (If Standard Serial Port not available)

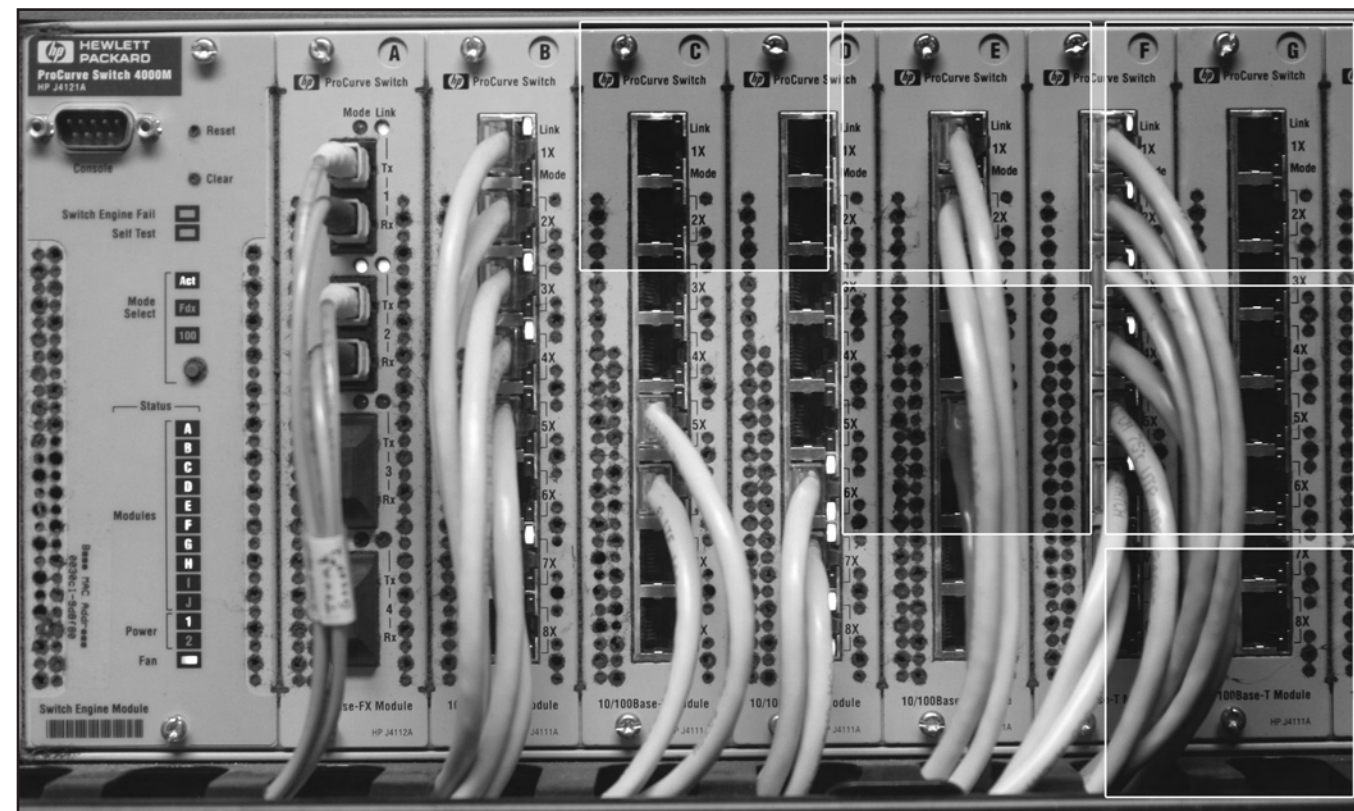
**Software Requirements:**

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 (fifth quarter) of training. Tool prices may vary. The estimated price does not include mark-up for program students or sales tax. The following tools are the 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 in. (pkg/200)  
 Electrical Tape  
 20" Soft-sided tool bag



**Administration**

**President** **J. Tuman, Ed.D.**  
 B.A., Central Washington University  
 M.Ed., Central Washington University  
 Ed.D., University of Washington

**Vice President, Operations** **Christine Cote**  
 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. in Special Education – Central Washington University  
 M.A. in Special Education – Central Washington University  
 Principal Certificate - Central Washington University

**Director of Finance** **Tracy Stoffer, CPA**  
 B.S., Central Washington University

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

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

**Financial Aid Director** **Kimri Murphy**  
 B.S., Central Washington University

**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  
 Graphics, Perry Technical Institute

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

**Recruiter** **Rudy Perez**  
 Instrumentation/Telecommunications, Perry Technical Institute

**Faculty**

**Automotive Technology**

**Joe Garcia - Department Head**  
 Certificate, Automotive, Perry Technical Institute  
 Washington State Vocational Education Certificate

**Lester Bigelow**  
 Instructor  
 ASE Certified Automotive Instructor  
 Washington State Vocational Education Certificate

**Electrical Technology**

**Ken McKee - Department Head**  
 Certificate, Electrical, Perry Technical Institute  
 Washington State Vocational Education Certificate

**Michael Brooks**  
 Instructor  
 Certificate, Electrical, Perry Technical Institute  
 Washington State Vocational Education Certificate

**Forrest Buchmann**  
 Instructor  
 Certificate, Electrical, Perry Technical Institute  
 Washington State Vocational Education Certificate

**Garrison LaMarche**  
 Instructor  
 Certificate, Electrical, Perry Technical Institute  
 Washington State Vocational Education Certificate

**Mike Tucker**  
 Instructor  
 Washington State Vocational Education Certificate

**Ron Zike**  
 Instructor  
 Washington State Vocational Education Certificate

**Graphic Technology**

**William Belford - Department Head**  
 A.A., Yakima Valley Community College  
 B.A., Central Washington University  
 Washington State Vocational Education Certificate

**Jamaica Kanzler**  
 Instructor  
 Certificate, Graphics, Perry Technical Institute  
 Washington State Vocational Education Certificate

**George May**  
 Instructor  
 Certificate, Graphics, Perry Technical Institute  
 Washington State Vocational Education Certificate

**HVAC/R Technology**

**Burt Ross - Department Head**  
 A.A., Yakima Valley Community College  
 Washington State Vocational Education Certificate

**Craig Heckart**  
 Instructor  
 Certificate, HVAC/R, Perry Technical Institute  
 Washington State Vocational Education Certificate

**Dan Henderson**  
 Instructor  
 A.A.S. Yakima Valley Community College  
 Washington State Vocational Education Certificate

**Marc Mitchell**

Instructor  
Certificate, HVAC/R, Perry Technical Institute  
Washington State Vocational Education Certificate

**Instrumentation & Industrial Automation Technology**

**Brian Remley – Department Head**

Instructor  
Certificate, Instrumentation, Perry Technical Institute  
Washington State Vocational Education Certificate

**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 Oswalt**

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  
Certificate, Instrumentation & Machine, Perry Technical Institute  
A.A., Yakima Valley Community College Instrumentation & Machine  
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

**Telecommunications & Limited Energy Technology**

**Michael Smith - Department Head**

Certificate, Instrumentation and Industrial Electronics,  
Perry Technical Institute  
Associate of Applied Science (AAS), Yakima Valley Community College  
Washington State Vocational Education Certificate

**Al Bass**

Instructor  
Certificate, Telecommunications, Perry Technical Institute  
A.A., Yakima Valley Community College  
Washington State Vocational Education Certificate

**Andy Fischer, RCDD**

Instructor  
Certificate, Telecommunications, Perry Technical Institute  
Washington State Vocational Education Certificate  
A.S. Telecommunications Technology, Yakima Valley Community College

**Josh Phillips**

Instructor  
Certificate, Telecommunications, Perry Technical Institute  
Washington State Vocational Education Certificate

---

**Phone List**

To call the following, please dial (509) 453-0374, then ask for the extension.

Operator . . . . . 0  
Receptionist/Information . . . . . 218  
Recruiting/Marketing Office . . . . . 214  
Communications . . . . . 219

**Student Services**

Admissions Office . . . . . 205  
Registrar’s Office . . . . . 227  
Manager . . . . . 227  
Office Assistant . . . . . 206

**Financial Services**

Student Accounts . . . . . 202  
Cashier’s Office . . . . . 218  
Financial Aid . . . . . 212  
Veterans . . . . . 212  
Manager . . . . . 208

**Administrative Services**

Accounts Payable . . . . . 213  
Purchasing/Food Service . . . . . 204  
Payroll and Contract Billing . . . . . 210  
Accounting and Finance . . . . . 207

**President/Foundation**

President . . . . . 200  
Vice President, Operations . . . . . 216  
Dean of Education . . . . . 211  
Foundation Director . . . . . 206  
Administrative Secretary . . . . . 217  
Administrative Office Assistant . . . . . 215