



## Los Angeles Trade-Technical College's "Green" Degrees, Certificates, and Courses

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### Current Green Degree/Certificate/Training Programs

#### **CHEMICAL TECHNOLOGY**

##### ***Chemical Technology Certificate and AS Degree with an Emphasis in Environmental and Industrial Laboratory Testing***

The Chemical Laboratory Technician (CLT) occupation is becoming the fastest growing occupational category in the U.S. The chemical technician generally performs laboratory work in a wide variety of biological and physical science settings such as waste water treatment plants, drinking water industry, air pollution testing, quality or grading studies of various materials such as paints, metals, various forms of "dirty" fuels, "green" fuel alternatives, construction materials, and quality control of industrial chemicals. Training is provided in applied chemistry, physics, mathematics and instrumental and computerized analysis.

Degrees Offered: An Associate in Science degree and/or Certificate in Chemical Technology with an emphasis on environmental and industrial laboratory testing. The A.S. degree requires 46 core units in addition to 18 general elective units. The Certificate in Chemical Technology requires 46 units of core courses.

Core courses directly related to green technology include:

- CHEM T 185 Directed Studies Environmental Health and Safety
- [CHEM T 111](#) & [121](#) Applied Chemistry I, II
- [CHEM T 131](#) Industrial Processes
- [CHEM T 168](#) Quality Control
- [CHEM T 132](#) & [142](#) Quantitative and Instrumental Analysis I, II
- [CHEM T 133](#) & [143](#) Organic Chemistry I, II
- [Physics 11](#) Introduction to Physics
- [Physics 29](#) Basic Physics for Technicians

*For more information on the Chemical Technology program and courses:*

- See pages 212-213 of the College's online catalog at: <http://www.lattc.edu/lattc/catalog/index.pdf>
- Contact the [Science Department](#) Chair, Xenia Wright, 213.763.7296, [WrightXV@lattc.edu](mailto:WrightXV@lattc.edu)
- For a schedule of Chemical Technology courses offered fall 2010 [click here](#)

#### **SOLAR DESIGN, INSTALLATION, and MAINTENANCE**

##### ***Solar Designer/Installer Course Series***

Los Angeles Trade-Technical College offers a series of 4 courses for individuals interested in working in the new, emerging field of solar energy. The courses enable individuals to be prepared to become certified by NABCEP (North American Board of Certified Energy Practitioners) and have two core courses have obtained NABCEP approval. In addition, the College offers a Fundamentals of Solar Electricity course ([ECONMT 105](#), 54 hours) that prepares individuals to be able to take the NABCEP Photovoltaic (PV) Entry Level Certificate of Knowledge test.

The series consists of the following courses from the Electrical Construction and Maintenance program.

Core courses directly related to green technology include:

- [ECONMT 105](#) Fundamentals of Solar Electricity
- [ECONMT 205](#) Solar Energy Installation & Maintenance Principles and Practices
- [ECONMT 110](#) Renewable Energy Systems (elective course)

For more information on the Solar Designer/Installer courses:

- For information contact William Elarton, Chair of [Construction, Design, and Manufacturing Department](#), 213.763.3701, [ElartoWD@lattc.edu](mailto:ElartoWD@lattc.edu)
- For a schedule of courses offered fall 2010 [click here](#)

## **WATER TECHNOLOGY**

### **Supply Water Technology AS Degree with an Emphasis in Water Purification**

The Water Systems Technology program at Trade-Tech offers includes a Supply Water option in which courses are focused on the operation and design of water systems, wells, pumps and meters; water treatment for potable water; water purification, and technical phases of automatic controls, including power and code considerations.

The Associate in Science degree in Supply Water Technology may be earned by completing the required courses listed below, along with 30 units of general education courses listed in Graduation Plan A, and 8 additional units of elective courses to meet the 60 unit requirement. Upon successful completion students will be prepared for certification by the AWWA as well as the State Department of Health. Students will also have the background to advance in the Supply Water Industry including water purification. The degree requires completion of Water Supply 4 and 5 (6 units total), water purification courses.

Core courses directly related to green technology include:

- [WATER 4](#) Water Purification I (Potable)
- [WATER 5](#) Water Purification II (Potable)
- [WASTE 15](#) Wastewater Operations IV (Basic Laboratory Analyses)
- [WASTE 18](#) Water and Wastewater Mathematics

### **Wastewater Technology AS Degree**

The Water Systems Technology program at Trade-Tech offers students a choice of two concentrations within water systems industry. The Wastewater option offers courses focusing on preliminary, primary, secondary, and tertiary treatment systems as well as disinfection methods, solids treatment, and solids and effluent disposal practices.

The Associate in Science degree in Wastewater Technology may be earned by completing the required courses listed below, 30 units of general education courses listed in Graduation Plan A, and 9 additional units of elective courses to meet the 60 unit requirement. In the State of California, there are five operator grade levels of profession in operating and maintaining publicly owned wastewater treatment facilities. Each grade level requires passing an examination administered by the State, after meeting qualifying experience and educational requirements. An Associates degree and 6 years of performance of an operator duty while holding a certificate, qualifies a person to be promoted to grade five level. Upon completion of the degree, students will have the potential for securing high-paying jobs.

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**For Additional Information** • Workforce and Economic Development Office: 213-763-5534  
• **LATTC Green Educational Programs** Website: <http://college.lattc.edu/green/education-training-programs/>



Core courses directly related to green technology are listed below. These courses have been approved by the California State Water Resource Control Board and are eligible for eight (8) educational points, for each 3 unit course completed, toward the Wastewater Treatment Plant Operators Certification educational requirements.

- [WASTE 12](#) Wastewater Operations I
- [WASTE 13](#) Wastewater Operations II
- [WASTE 14](#) Wastewater Operations III
- [WASTE 15](#) Wastewater Operations IV (Basic Laboratory Analyses)
- [WASTE 16](#) Wastewater Operations V (Mechanics, Fluids, Electricity)
- [WASTE 17](#) Wastewater Operations VI (Public Health, Environment, and Management)
- [WASTE 18](#) Water and Wastewater Mathematics

*For more information on Water Technology programs and courses:*

- See pages 216-218 of the College's online catalog at: <http://www.lattc.edu/lattc/catalog/index.pdf>
- Contact the [Science Department Chair](#), Xenia Wright, 213.763.7296, [WrightXV@lattc.edu](mailto:WrightXV@lattc.edu)
- For a schedule of Waste Water Technology courses offered fall 2010 [click here](#).
- For a schedule of Waste Supply Technology courses offered fall 2010 [click here](#).

## **Weatherization and Energy Efficiency Certificate of Achievement**

### ***Weatherization and Energy Efficiency Certificate***

Los Angeles Trade-Technical College offers a series of courses for individuals interested in employment as weatherization and energy efficiency specialists. The courses are developed both for new building professionals and for professional builders/contractors already in the workforce in need of these skills. Homeowners may also find the intro class helpful. Individuals will be prepared to be weatherization, energy efficiency, and retrofit technicians, home improvement retrofit trainees, residential air sealing technicians, insulation installers, energy conservation representatives or residential energy field auditors.

Core courses directly related to green technology include:

- [BLDGCTQ 007](#) Weatherization - Practical Energy Efficiency Techniques
- [BLDGCTQ 008](#) Weatherization - Energy Efficiency Practices
- [BLDGCTQ 009](#) Energy Auditor - Residential
- [BLDGCTQ 012](#) Energy Auditor - Residential Practice

*For more information on the Weatherization and Energy Efficiency courses:*

- For information on Building and Construction Techniques courses (BLDGCTQ) in the program contact: William Elarton, Chair of Construction, [Design, and Manufacturing Department](#), 213.763.3701, [ElartoWD@lattc.edu](mailto:ElartoWD@lattc.edu)

- For a schedule of Building and Construction Techniques courses offered fall 2010 [click here](#).

## **Hybrid & Electric Plug-In Vehicle Technology Certificate of Achievement**

### ***Hybrid and Electric Vehicle Certificate***

The short-term, certificate program in Hybrid and Electric Plug-In Vehicle at Los Angeles Trade-Technical College offers a series of courses for individuals interested in employment as vehicle technicians. The courses are developed both for new technicians and for incumbent technicians already in the workforce in need of these skills. Individuals will be prepared to be weatherization, energy efficiency, retrofit technician, home improvement retrofit trainees, residential air sealing technicians, and insulation installers. The Certificate includes 20 units of coursework.

Core courses directly related to green technology include:

- [DIESLTK 301](#) Introduction to Alternative Fuels & Hybrid Vehicle Technology
- [DIESLTK 302](#) Hybrid and Plug-in Electric Vehicle
- [DIESLTK 303](#) Advanced Hybrid and Plug-in Electric Vehicles

*For more information on the Hybrid and Elective Vehicle Certificate courses:*

- For information on courses in the program (DIESLTK) contact: Jess Guerra, [Diesel, Alternative Fuel, and Hybrid Vehicle Technologies](#) program 213.763.3919, [GuerraJ@lattc.edu](mailto:GuerraJ@lattc.edu)
- For information on green courses in the Transportation Technologies department contact: Rudy Serrato, Chair, [Transportation Technologies](#) department 213.763.3908, [SerratRC@lattc.edu](mailto:SerratRC@lattc.edu)
- For a schedule of Diesel Technology courses offered fall 2010 [click here](#).

### **Certificates and Degrees Coming Soon (pending California Community Chancellor's Office Approval)**

- Renewable Energy AS Degree with Emphasis in Solar Thermal
- Solar Thermal Installation and Maintenance Technician Certificate of Achievement
- Renewable Energy AS Degree with Emphasis in Solar PV
- Solar PV Installation and Maintenance Technician Certificate of Achievement
- Renewable Energy AS Degree with Emphasis in Energy Efficiency
- Energy Systems Technology Fundamentals Certificate of Achievement
- Renewable Energy Generation, Transmission, and Distribution AS Degree with Emphasis in Powerline Mechanic
- Powerline Mechanic Certificate of Achievement
- Utility Industry Fundamentals Certificate of Achievement

## Current Green Courses and/or Content

### ARCHITECTURE

All Architecture courses include "green" course content covering sustainability principles, materials. As such, at least 5% of course content in Architecture courses is green-related. In addition, the following courses have more substantial green-related content as indicated.

<a href="#">ARCH 151</a>	Materials of Construction
A study is made of the basic building materials, such as wood, steel, concrete, and masonry, and their uses in the construction field. Non-structural materials such as glass, roofing, plastics and paint are explored, as well as the sixteen divisions of construction. Green building materials are reviewed.	
Percent of Green Course Content:	80%

<a href="#">ARCH 152</a>	Equipment of Building
A study of principles involved in the design and application of mechanical equipment to buildings for plumbing, heating, air conditioning, electrical power distribution, illumination, vertical transportation and acoustic systems. Green building materials are reviewed.	
Percent of Green Course Content:	80%

<a href="#">ARCH 202</a>	Basic Architectural Design II
This course explores creative architectural design through the planning of buildings and public spaces with concern for function, orientation, structure and materials. Sustainable design principles are covered.	
Percent of Green Course Content:	70%

<a href="#">ARCH 342</a>	Metropolitan Access Planning Systems II (MAP/GIS)
CAD, GIS, Data Systems and Internet in one course. GIS technology and related digital technologies are used to explore Intelligent drawings, as well as, drawings that have multiple types of information associated with them. Data collection will be used to evaluate environment of the city. Sustainable design principles are covered.	
Percent of Green Course Content:	60%

<a href="#">ENV 101</a>	Environmental Design
Basic architectural elements, form and composition are studied mainly through two-dimensional drawing media to organize space. Some two-dimensional concepts are translated and transformed into a three-dimensional conceptual model. Emphasis is placed in analytic techniques and problem solving in the design process. Sustainable design principles are covered.	
Percent of Green Course Content:	50%

<a href="#">ENV 105</a>	Sustainable Design and Environments
"A framework for sustainable environment in which the built environment, natural environment, economic development and social life are seen as mutually dependent". This course will cover the basic concept of sustainability as a dynamic condition characterized by the interdependency among all environments. Students will develop "green projects" such as recyclable products, prototypes of urban spaces, new lifestyle concepts, frameworks for overall evaluation, solutions for saving energy and quantifiable/qualifiable "smart" spaces.	
Percent of Green Course Content:	100%

<a href="#">INT 200</a>	Architectural Interiors
A study is made using a "small house project" layout, livability, functionality, size, orientation, cost, furnishing, equipment, ornamentation and future inhabitants. The "small house project" is put in context through a brief history of American shelters – their construction types and styles. At this point in the course, the student is ready for developing, retrofitting, adding and remodeling the "small house project" including basic construction details. Residential construction problems are explored with an emphasis placed in functional design. Sustainable design principles are covered.	
Percent of Green Course Content:	80%

**\* See Also Drafting**

*For a schedule of Architecture Technology courses offered fall 2010 [click here](#).  
For a schedule of Architecture Environmental Design courses offered fall 2010 [click here](#).*

**BUILDING CONSTRUCTION TECHNIQUES**

All Building Construction Techniques courses include "green" course content covering sustainability principles, materials, and practices including energy efficiency, mitigating impact of construction on environment, and reducing waste. As such, at least 5% of course content in Building Construction Techniques courses is green-related. In addition, the following courses have more substantial green-related content as indicated.

<a href="#">BLDGCTQ 10</a>	CADD for Sustainable Landscape Design
Computer Aided Design/Drafting (CADD) applications specific to landscape professionals. Includes introduction to CADD skills, block functions, Internet applications, three-dimensional design, presentation drawings, building systems, working drawings, and working drawing coordination.	
Percent of Green Course Content:	80%

<a href="#">BLDGCTQ 7</a>	Weatherization - Practical Energy Efficiency
This course provides expertise advice on various techniques that can be used to weatherize homes and other structures. The course is suitable for application by a professional home or energy inspector. Homeowners would also benefit from the knowledge and application of the simpler techniques. Efficiency techniques related to: Energy basics, sealing, insulating, window replacement/installation, environmental air, water, appliance energy efficiency, and lighting are just some of the areas that will be covered.	
Percent of Green Course Content:	100%

<a href="#">BLDGCTQ 8</a>	Weatherization - Energy Efficiency Practices
This course provides laboratory exercises to build skills necessary for the effective application of energy techniques that can be used to weatherize homes and other structures. Course is suitable for application by a professional weatherization contractor training entry level workers or a homeowner looking to improve their own home. Efficiency practices related to: Energy basics, sealing, insulating, window	

replacement/installation, environmental air, water, appliance energy efficiency, and lighting are just some of the areas that will be covered	
Percent of Green Course Content:	100%

<a href="#">BLDGCTQ 9</a>	Energy Auditor – Residential
A course focusing on residential energy requirements, loss and efficiency. How energy is used and lost will be discussed, along with the testing techniques and approaches to measure the amount of energy lost. Students will learn the components of an energy audit report and complete necessary forms.	
Percent of Green Course Content:	100%

<a href="#">BLDGCTQ 10</a>	CADD for Sustainable Landscape Design
Computer Aided Drafting (CADD) applications specific to landscape professionals.	
Percent of Green Course Content:	100%

<a href="#">BLDGCTQ 12</a>	Energy Auditor – Residential Practice
A course focusing on the practical application of residential energy requirements, loss and efficiency. Testing techniques and measurement the amount of energy lost. Students will perform actual energy audits of simulated structures and complete necessary forms.	
Percent of Green Course Content:	100%

**\*For other construction-related green courses, see also Carpentry, Electrical and Construction Maintenance, Plumbing, and Refrigeration and Air Condition courses.**

*For a schedule of Building Construction Techniques courses offered fall 2010 [click here](#)*

### **CARPENTRY**

All courses in the Carpentry program include “green” course content covering sustainability principles, materials, and practices including energy efficiency, mitigating impact of construction on environment, and reducing waste. As such, at least 5% of course content in Carpentry courses is green-related.

<a href="#">CRPNTRY 117</a>	Construction Materials
This course focuses on building materials such as concrete, steel and a variety of woods used for exterior and interior carpentry finish. Insulation, flashing, roof covering, interior and exterior wall covering, wood trim and other finish materials in residential construction are studied. Rough and finish hardware such as nails, screws, bolts, timber fasteners, gang nailing, power fastening, powder actuated fasteners, joist hangers, clips and installation methods are also reviewed. Green building materials are reviewed.	
Percent of Green Course Content:	5%

<a href="#">CRPNTRY 118</a>	Materials
This course explores materials such as wood, lumber, sheet materials, fasteners, hardware, glass, laminates, hangers, and clips. Lumber grades and sizes and methods of installation are also covered. Green building materials are reviewed.	
Percent of Green Course Content:	5%



<a href="#">CRPNTRY 123</a>	Basic House Construction
Instruction includes building layout and the use of the transit; floor, wall and the roof framing; application of existing building codes and wood stair layout and framing. Construction of large scale models of typical one-story, two-story and split level houses are explored. Green house construction principles are reviewed.	
Percent of Green Course Content:	5%

<a href="#">CRPNTRY 126</a>	Construction II
This course focuses on principles of estimating, quantity take-off, material and labor costs, bidding procedures, remodeling and new residential and commercial construction. Green construction principles are reviewed.	
Percent of Green Course Content:	5%

<a href="#">CRPNTRY 144</a>	Residential Exterior Finish
Training is provided in principles and skills in residential exterior finish work. Instruction includes siding, stucco, roof covering and window installation, and green materials installation.	
Percent of Green Course Content:	5%

<a href="#">CRPNTRY 240</a>	Building Construction Specialties
This course focuses on drafting and interpreting plans, construction method and techniques as they relate to building codes, building layout, foundation construction, green construction, exterior and interior carpentry techniques as well as residential framing.	
Percent of Green Course Content:	5%

**\*For other construction-related green courses, see also Building Construction Techniques, Electrical and Construction Maintenance, Plumbing, and Refrigeration and Air Condition courses.**

*For a schedule of Carpentry courses offered fall 2010 [click here](#)*

### **CHEMICAL TECHNOLOGY**

<a href="#">CHEM T 131</a>	Industrial Processes
Chemical manufacturing industries are major contributors that affect our local and global environment. This course is designed to give an in-depth study of the most current traditional and green chemical technology concepts and principles that are having a significant affect on both the chemical industry and our environment. State and federal regulations and policies concerning laboratory testing, safety, waste minimization and disposal are a few of the areas of interest to be studied. Emerging green chemical industry processes will be explored and related laboratory analysis will be performed. Industry partners will participate as guest lecturers and on-site advisors for this newly emerging area. An intensive learning environment will be offered to the student in the area of environmental industry standards for test analysis that monitor a more "green" friendly environment and verify sustainability. The students will perform real industry hands-on laboratory testing using the Environmental Protection Agency (EPA) test methods and others.	
Percent of Green Course Content:	20%

*For a schedule of Chemical Technology courses offered fall 2010 [click here](#)*

### **COMMUNITY PLANNING**



<a href="#">COMPLAN 71</a>	Green Building Basics for Developers
Students will learn the purpose, principles and process for planning and developing LEED certified buildings. Students analyze: the elements of a LEED certification check-list, the cost of LEED, sustainable site selection, and operational issues, including water efficiency, transportation and energy credits, renewable technologies. Learn about the requirements for taking the LEED exam.	
Percent of Green Course Content:	100%

*For a schedule of Community Planning courses offered fall 2010 [click here](#)*

### **DRAFTING**

<a href="#">DRAFT 10</a>	CADD for Sustainable Landscape Design
Computer Aided Design/Drafting (CADD) applications specific to landscape professionals. Includes introduction to CADD skills, block functions, Internet applications, three-dimensional design, presentation drawings, building systems, working drawings, and working drawing coordination.	
Percent of Green Course Content:	80%

*For a schedule of Drafting courses offered fall 2010 [click here](#)*

### **DIESEL TECHNOLOGY**

<a href="#">DIESLTK 301</a>	Introduction to Alternative Fuels & Hybrid Vehicle Technology
This course provides an introduction to various alternative fuel technologies being used in the automotive and heavy-duty diesel fields. Covers description and basic operation of Ethanol, Biodiesel, Compressed Natural Gas (CNG), Liquified Natural Gas (LNG), Fuel Cell and hybrid vehicle technologies.	
Percent of Green Course Content:	100%

<a href="#">DIESLTK 302</a>	Hybrid and Plug-in Electric Vehicle
This course covers hybrid vehicle system fundamentals including hybrid vehicle safety, special tools, different hybrid system configurations, high voltage battery construction and maintenance, de-power procedures and basic service.	
Percent of Green Course Content:	100%

<a href="#">DIESLTK 303</a>	Advanced Hybrid and Plug-in Electric Vehicles
This course covers advanced hybrid vehicle system diagnostics and replacement of hybrid and plug-in electric components such as high voltage battery, electric motor, capacitors, etc. Troubleshooting of gasoline/diesel engine will also be covered.	
Percent of Green Course Content:	100%

*For a schedule of Diesel Technology courses offered fall 2010 [click here](#)*

### **ELECTRCIAL CONSTRUCTION AND MAINTENANCE**

<a href="#">ECONMT 105</a>	Fundamentals of Solar Electricity
This course is designed students interested in a career in the solar industry. The fundamental principles and functions of photo voltaic industry will be introduced. This course covers planning, installation, maintenance and all the necessary components for a photo voltaic system. The transmission and distribution of electric power will be reviewed. Basic concepts of electricity, identification, functions and operations of components	

will be surveyed.	
Percent of Green Course Content:	100%

<a href="#">ECONMT 110</a>	Renewable Energy Systems
This course covers energy basics, solar basics: active and passive solar, solar-thermal and solar-electric; wind; water (hydropower, wave and tidal power); biofuel and biomass resources; geothermal power; energy storage and hydrogen fuel cells. Both large and small scale, grid interactive and stand alone systems will be discussed. Energy collection, site evaluation, design analysis of various systems, material use, and methods of construction ("green building") will also be covered, along with overviews of California and US energy policy and global energy use.	
Percent of Green Course Content:	100%

<a href="#">ECONMT 159</a>	Programmable Logic Controls
This course is a survey of the various types of robots presently being used in industry. Topics covered include principal types of robots, robotic programming, and interfacing. Main physical components, practical uses and applications are explored. Sustainable systems are covered.	
Percent of Green Course Content:	10%

<a href="#">ECONMT 164</a>	Sustainable Lighting Principles and Practices
The design of <b>sustainable</b> residential and commercial lighting systems. Including both indoor and outdoor applications. Utilizing drawings, lumen calculations, traditional and <b>energy efficient light sources</b> , color, lamp type, <b>efficiency</b> and maintenance requirements of lighting systems.	
Percent of Green Course Content:	100%

<a href="#">ECONMT 187</a>	Advanced Programmable Controllers
This course focuses on advanced programmable controller techniques including ladder logic and Boolean algebra in a hands-on laboratory environment, including controllers for green electronic systems.	
Percent of Green Course Content:	10%

<a href="#">ECONMT 205</a>	Solar Energy Installation & Maintenance Principles and Practices
This course is designed for individuals that have the basic electrical and mechanical skills of an energy technician or electrician and are looking to expand into the renewable energy field. This is a hands on class to develop the fundamental principles and practices for installation and maintenance of solar, wind, and similar renewable energy systems. This course covers basic planning, installation, and maintenance of the necessary components for various renewable energy systems.	
Percent of Green Course Content:	100%

<a href="#">ECONMT 210</a>	Fundamentals of Process Instrumentation
This class provides a study of the measurement and control of temperature, pressure, level, flow, humidity and other factors that can be analyzed and controlled. It includes a study of instrumentation symbols, Process and Instrumentation Diagrams, and the use of pneumatic and electric sensors, transmitters, controllers, valves, actuators, positioners, Programmable Logic Controllers, and computers to implement control strategy, including green technologies. Processes used to mitigate impact on the environment are covered.	
Percent of Green Course Content:	10%

<a href="#">ECONMT 215</a>	Small Wind Energy Systems Principles and Practices
This course is designed for individuals that have the basic electrical and mechanical skills of an energy technician or electrician and are looking to expand into the small wind energy field. This class will help one to develop the fundamental knowledge and skill sets typically required for small wind system practitioners and to help ensure safety, quality and consumer acceptance of small wind installations.	
Percent of Green Course Content:	100%

**\*For other construction-related green courses, see also Building Construction Techniques, Carpentry, Plumbing, and Refrigeration and Air Condition courses.**

*For a schedule of Electrical Construction and Maintenance courses offered fall 2010 [click here](#)*

### **GENERAL EDUCATION**

<a href="#">HEALTH 11</a>	Principles of Healthful Living
This course includes a module on environmental health. Content includes conserving energy and improving the air, saving the ozone layer, reducing garbage, reducing chemical pollution and toxic waste, saving water, and preserving wildlife and natural environment, biodiversity, and reducing noise pollution.	
Percent of Green Course Content:	6%

<a href="#">HUMAN 1</a> (Humanities 1)	Cultural Patterns of Western Civilization
Course includes elements of human experience that relate to humans role as custodians of the earth. Content includes origins of natural oil and how the use of oil leads to escalating world conflicts and the availability and use of alternative methods of transportation.	
Percent of Green Course Content:	10%

### **OPERATIONS MAINTENANCE**

<a href="#">OPMAINT 228</a>	Steam Plant Operation I
Related engineering information concerning high pressure steam plants in office buildings and industrial establishments are studied in this course. Emphasis is given to steam power plant, use of steam tables, types of boilers, construction of boilers, boiler accessories, settings for combustion equipment and heating surfaces; operation of steam boilers and the combustion of fuels. Includes content on green technologies.	
Percent of Green Course Content:	10%

<a href="#">OPMAINT 229</a>	Steam Plant Operation II
Instruction is given in steam engines, valve operating mechanisms and governors, and operating characteristics of steam engines. Course covers steam turbines, pumps, and auxiliary power plant equipment, steam plant efficiencies, boiler water treatment, troubleshooting, and power transmission. Completion of this second course prepares trainee to take Los Angeles City examination for steam engineer's license. Includes content on green technologies.	
Percent of Green Course Content:	10%

**NOTE: The following courses are Apprenticeship courses and available only to individuals who are in an apprenticeship program.**

<a href="#">OPMA APP 703</a>	Computers In Energy Management For Apprentices
This course introduces the apprentice building engineer to the computer as it is used to control the	

environment in modern buildings. The control of the environment includes monitoring the safety and energy usage in industrial and institutional buildings.	
Percent of Green Course Content:	20%

<a href="#">OPMA APPR 720</a>	Heating and Ventilation Plant Operation For Apprentices
Training is given in the operation of systems to provide quality air to indoor environments and abide by Indoor Air quality (IAQ) requirements.	
Percent of Green Course Content:	20%

<a href="#">OPMA APPR 730</a>	Safety and Energy Management For Apprentices
The fundamentals of energy conservation as applied to commercial, residential, institutional and industrial buildings; the optimal operation of these systems to conserve energy are reviewed. The emphasis of the course is on the changes that an operating engineer can make to conserve energy and protect the environment.	
Percent of Green Course Content:	80%

<a href="#">OPMA APPR 744</a>	Refrigeration and A/C Controls for Apprentices
The fundamentals of energy conservation as applied to commercial, residential, institutional and industrial buildings; the optimal operation of these systems to conserve energy are reviewed. The emphasis of the course is on the changes that an operating engineer can make to conserve energy and protect the environment.	
Percent of Green Course Content:	20%

**For a schedule of Operations Maintenance courses offered fall 2010 [click here](#)**

### **PLUMBING**

<a href="#">PLUMBNG 250</a>	Design and Construction Specialties
Instruction is given in plumbing layout drawing, blueprint reading, principles and practices of water supply and distribution, special waste piping practices, use of elementary backflow prevention devices, plumbing installation techniques, introductory principles and practices of solar domestic water heating. Includes content on green technologies. New materials used to reduced impact on the environment are covered.	
Percent of Green Course Content:	40%

**\*For other construction-related green courses, see also Building Construction Techniques, Carpentry, Electrical and Construction Maintenance, and Refrigeration and Air Condition courses.**

**For a schedule of Plumbing courses offered fall 2010 [click here](#)**

### **REFRIGERATION AND AIR CONDITIONING/HVAC**

<a href="#">REF A/C 105</a>	Solar Water & Pool Heating System Principles
This course is designed for students interested in a career in the solar thermal industry. The fundamental principles and functions related to the solar thermal industry will be introduced. This course covers the theory, planning, installation, maintenance and necessary components for a solar thermal water system. The specifics for pools heating systems will also be reviewed. Basic heating, plumbing, and related concepts will also be covered.	
Percent of Green Course Content:	100%

<a href="#">REF A/C 110</a>	Solar Water & Pool Heating System Practices
This course is designed for students interested in a career in the solar thermal industry. The fundamental practices and functions of the solar thermal industry will be introduced. This course covers the skills and practices for planning, installation, and maintenance of all the necessary components for a solar thermal water system.	
Percent of Green Course Content:	100%

<a href="#">REF A/C 141</a>	Applied Refrigeration and Air Conditions
This course focuses on Chemistry as applied to the HVAC and R industry. Areas covered include hydronics, heating and cooling load calculations, control wiring, introduction to the uniform mechanical code, pneumatic controls, troubleshooting approaches, and employment. Includes content on green technologies.	
Percent of Green Course Content:	10%

<a href="#">REF A/C 165</a>	Thermal Energy Storage and Heat Recovery
Thermal energy storage and heat recovery principles of TES and basic definitions are the focus of study in this course. Load profile and electric cost are introduced and system design including space requirements and component election based on load profiles and costs are covered.	
Percent of Green Course Content:	100%

<a href="#">REF A/C 166</a>	Water Towers, Evaporative Condensers and Chemical Treatment
Fundamentals of water towers and evaporative condensers used to obtain high efficiency performance of refrigeration and air conditioning systems. You will learn how to select the proper size depending on local humidity and desired operating conditions, proper maintenance, additives and procedures and techniques available to the technician.	
Percent of Green Course Content:	100%

<a href="#">REF A/C 208</a>	Refrigerant Management - EPA 608 Certification
This course is a preparatory course for the EPA Section 608 Technician Certification Type I, II, III, and the Universal Certification. Students are trained in refrigerant management including the EPA Section 608 ruling, the Montreal Protocol, Ozone Depletion and Global Warming. Note: Certification testing is will be available at the end of the semester for an additional fee.	
Percent of Green Course Content:	100%

<a href="#">REF A/C 210</a>	Refrigeration System Efficiency Factors
This course covers factors that impede or enhance refrigeration systems for maximum energy efficiency. The course also covers controls, systems, and processes of energy efficient refrigeration systems.	
Percent of Green Course Content:	100%

<a href="#">REF A/C 250</a>	Indoor Air Quality
This course emphasizes on operation of systems to provide quality air to indoor environments. AQMD requirements and pending regulations are reviewed. Organizing and implementing maintenance programs that include indoor air quality assessment and air balancing HVAC systems are covered. Includes content on energy conservation and green technologies.	
Percent of Green Course Content:	30%

**\*For other construction-related green courses, see also Building Construction Techniques, Carpentry, Electrical and Construction Maintenance, and Plumbing courses.**

**For a schedule of Refrigeration A/C courses offered fall 2010 [click here](#)**

**SOLID WASTE MANAGEMENT**

<a href="#">SWM TEK 101</a>	Introduction to Solid Waste Management
This course offers instruction in the fundamentals of solid waste management including characteristics of solid wastes, refuse storage, collection, transportation, and disposal methods, financing methods and solid waste planning.	
Percent of Green Course Content:	30%

<a href="#">SWM TEK 102</a>	Collection Systems, Routing, & Management
This course offers in-depth instruction in the techniques and fundamentals involved in efficient solid waste routing, which includes topographical variables such as: alleys, one-way streets, hilly areas, downtown areas and residential communities. The course includes a bold approach to routing for mechanized solid waste collection activities, as well as an overview of routing to affect increased productivity, cost reduction, public relations through proper route planning and safety.	
Percent of Green Course Content:	30%

<a href="#">SWM TEK 107</a>	Waste Reduction & Recycling
This course is an introduction to the Science of Resource Recovery. It presents a broad overview of the methods and techniques, equipment and facilities required in recovery processes. Emphasis is placed on costs and management of the recovery process. Nuclear and non-nuclear types of resource recoveries are studied.	
Percent of Green Course Content:	100%

<a href="#">SWM TEK 108</a>	Solid Waste Facilities
This course covers history and legislation of solid waste generation and the need for effective transfer stations and landfills. It contains an overview of the handling of materials for both resource recovery and disposition of hazardous and non-hazardous waste. The future needs of the public and private sectors are studied.	
Percent of Green Course Content:	70%

**For a schedule of Solid Waste Management courses offered fall 2010 [click here](#)**

**WASTE WATER TECHNOLOGY**

<a href="#">WASTE 12</a>	Wastewater Operations I
This course is a survey and introductory course into wastewater systems for operations and maintenance personnel, administrative, engineering and laboratory personnel may benefit from this course.	
Percent of Green Course Content:	30%

<a href="#">WASTE 13</a>	Wastewater Operations II
A comprehensive study is made of preliminary, primary, and secondary treatment systems and operations including selected field studies.	
Percent of Green Course Content:	100%

<a href="#">WASTE 14</a>	Wastewater Operations III
This is a comprehensive study of disinfection methods, tertiary treatment, water reclamation, solids treatment, solids and effluent disposal practices.	
Percent of Green Course Content:	100%

<a href="#">WASTE 15</a>	Wastewater Operations IV (Basic Laboratory Analyses)
This is an introduction into the fundamentals of chemistry and laboratory techniques used to monitor wastewater treatment operations.	
Percent of Green Course Content:	100%

<a href="#">WASTE 16</a>	Wastewater Operations V (Mechanics, Fluids, Electricity)
The practical application of engineering fundamentals, such as hydraulics mechanics, electricity and instruments as practiced in wastewater treatment.	
Percent of Green Course Content:	40%

<a href="#">WASTE 17</a>	Wastewater Operations VI (Public Health, Environmental, Management)
Public health, the environment, regulations, management/ supervision and report writing as practiced in wastewater and water reclamation plants safety are covered.	
Percent of Green Course Content:	100%

<a href="#">WASTE 18</a>	Water and Wastewater Mathematics
This is a review and practice of basic mathematical concepts required to solve wastewater treatment problems.	
Percent of Green Course Content:	30%

**For a schedule of Waste Water Technology courses offered fall 2010 [click here](#)**

### **WASTE SUPPLY TECHNOLOGY**

<a href="#">WATER 4</a>	Water Purification I (Potable Water)
This beginning course in water treatment covers public health, water quality control, and operation and maintenance. The student is prepared for the Grade 1 and 2 treatment certification by the State Department of Health.	
Percent of Green Course Content:	100%

<a href="#">WATER 5</a>	Water Purification II (Potable Water)
This is an advanced course in water treatment covering public health, water quality control and operation and maintenance. The student is prepared for the Grade 3 treatment certification by the State Department of Health.	
Percent of Green Course Content:	100%

**For a schedule of Water Supply Technology courses offered fall 2010 [click here](#)**