Solar Technologies, A.A.S.

The future of US energy prosperity rests on developing a portfolio of technologies and practices that can address America's energy needs--technologies that increase and diversify domestic energy supply, while having little or no effect on the environment. To that end the Solar Technologies AAS is structured to train professional designers, technicians and installers in a full spectrum of solar hardware, software, and best practices. The degree program targets those who see the AAS as a terminal degree and will enter the market prepared to design and install state of the art solar energy systems. The program is also adaptable to the needs of a student who is considering a four year degree option in technology or engineering. Students will prepare to sit for the North American Board of Certified Energy Practitioners (NABCEP), Entry Level Solar Thermal and Entry Level Solar Photovoltaic (PV) Installer exams.

Additionally the program will provide opportunities for the participants to gain necessary field experience for full NABCEP Solar Thermal and PV Installer Certification.

(Major Code 2190; State CIP Code 15.0505)

- Solar Technology (http://www.jccc.edu/solar-technology)

Associate of Applied Science

First Semester

ELTE 122	National Electrical Code I	4
ELTE 125	Residential Wiring Methods*	4
ELTE 123	Electromechanical Systems	4
CET 150	Construction Safety	3
or INDT 125	Industrial Safety/OSHA 30	
INDT 155	Workplace Skills	1
Total Hours		16

Second Semester

HPER 200	First Aid and CPR	2
ENGL 121	Composition I*	3
EPRM 120	Introduction to Residential Energy	3
EPRM 142	Solar Thermal Systems	3
HVAC 125	Energy Alternatives	2
MATH 130	Technical Mathematics I*	3
Total Hours		16

Third Semester

DRAF 129	Interpreting Architectural Drawings	2
EPRM 252	Solar Electric Systems*	3
EPRM 256	Solar Electric Systems Lab*	1
ELTE 210	Code Certification Review*	3
ELTE 271	Electrical Internship I*	3
Social Science and/or Economics Elective ^		3
Total Hours		15

^ Social Science and/or Economics Elective (http://catalog.jccc.edu/spring/degreecertificates/electives/social-sci-econ-aas)

Fourth Semester

Technical Electives (see below)		5
ELTE 202	Electrical Estimating*	3
ENGL 123	Technical Writing I*	3
CET 105	Construction Methods	3

Humanities Elective ^	3
Total Hours	17

^ Humanities Elective (http://catalog.jccc.edu/spring/degreecertificates/electives/humanities-aas)

Technical Electives

BUS 140	Principles of Supervision	3
BUS 145	Small Business Management	3
CET 150	Construction Safety	3
CPCA 128	PC Applications: MS Office	3
DRAF 130	Introduction to CAD Concepts - AutoCAD*	3
DRAF 250	Electrical Drafting*	3
ELEC 120	Introduction to Electronics	3
ELEC 125	Digital Electronics I	4
ELEC 131	Introduction to Sensors and Actuators	3
ELEC 133	Programmable Controllers	3
ELEC 165	Advanced Programmable Controllers*	3
ELEC 185	LAN Cabling and Installation	3
ELTE 200	Commercial Wiring Methods*	4
ELTE 215	Generators, Transformers and Motors*	4
ENTR 142	Fast Trac Business Plan	3
HVAC 121	Basic Principles of HVAC*	4
INDT 125	Industrial Safety/OSHA 30	3

Total Program Hours: 64

Courses

EPRM 120 Introduction to Residential Energy* (3 Hours)
Prerequisites or corequisites: RDG 126 or College Reading Readiness

Upon successful completion of this course, the student should be able to evaluate energy usage of the past and the future, describe the energy picture of today's world, identify the priorities for energy efficiency, and describe the purpose of a residential energy audit. Competencies will include knowing energy and the laws of thermodynamics; heat transfer through building envelope; sources of internal heat gain and heat loss calculations; energy transformation and heat flow; efficiency of HVAC systems, water heating systems, and appliances; and basic electrical wiring, lighting, and components of a residence. 3 hrs. lecture/wk.

EPRM 123 Active Passive Residential Systems* (4 Hours)
Prerequisites: EPRM 120 or deparment approval

This is a course to explain how active and passive systems work together in a residence, and to discuss the energy efficiency of each system. Upon successful completion of this course, the student will be able to identify the components of the building shell and their relationship to air-conditioning systems, heating systems, hot water heating, lighting, appliances, occupants, and the electrical or gas systems that supply energy. Topics will include heat laws, refrigeration cycle, electrical theory, various types of furnaces, air conditioners, hot water heaters, lighting, windows and doors, and various types of controls. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment.

EPRM 127 Residential Energy Data Collection and Input* (3 Hours)
Prerequisites: ERPM 123

Upon successful completion of this course, the student will be able to identify techniques and procedures used in the residential construction industry to determine the construction details of the residence, the size and type of HVAC equipment, and other appliances as it relates to a residential energy audit. The student will be required to complete field data collection forms and record detailed information of the components of a residence. This data will be entered into various computer modeling programs. The output from the software will help determine what recommendations should be made to the homeowner to improve the energy efficiency of their residence. 2 hrs. lecture, 2 hrs instructional lab.

EPRM 130 Residential Energy Auditing Application* (3 Hours)
Prerequisites or corequisites: EPRM 127

This course outlines a complete energy audit procedure that will ensure consistent data collection for a residence. Topics include diagnostic procedures to evaluate the building shell, doors and windows, air leakage, and other residential energy inefficiencies. The course includes recommendations the auditor can make to increase the energy efficiency and functionality of a client's home based on the audit. Analysis of residential heating and cooling systems and appliances, as well as performing a combustion appliance zone test is included in the course. A major focus of the course is the use of appropriate test equipment, such as a blower door, duct blaster, and other hand-held evaluation and measuring devices necessary to conduct effective energy audits. Information from the audit will be entered into modeling software to determine energy efficiency measures for the residence being audited. Students will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 1 hr. lecture, 3 hrs instructional lab/wk.

EPRM 142 Solar Thermal Systems* (3 Hours)
Prerequisites or corequisites: RDG 126 or College Reading Readiness

Solar Thermal Systems presents the key components of thermal conversion systems to absorb and use heat from sunlight. Solar module types and properties, balance of system components, energy management, and economics for a variety of solar thermal system applications are studied. The course includes details of design, installation, operation, and evaluation of solar thermal systems. The course prepares students for the NABCEP (North American Board of Certified Energy Practitioners) Entry Level Solar Thermal exam. 4 hours of integrated lecture lab/wk.

EPRM 252 Solar Electric Systems* (3 Hours)
Prerequisites: ELTE 125 or ELTE 200

Solar Electric Systems presents the key components of photovoltaic (PV) conversion systems to produce electricity from sunlight. Solar module types and properties, balance of system components, stand-alone and utility interface, energy management, and economics for a variety of PV applications are studied. The course includes details of design, installation, operation, and evaluation of photovoltaic systems. The course prepares students for the NABCEP (North American Board of Certified Energy Practitioners) Entry Level PV exam. 3 hrs. lecture/wk.

EPRM 256 Solar Electric Systems Lab* (1 Hour)
Prerequisites or corequisites: EPRM 252

Solar Electric Systems Lab presents practice in the use of the key components of photovoltaic (PV) conversion systems to produce electricity from sunlight. Solar module types and properties, balance of system components, stand-alone and utility interface PV applications are installed. The course includes hands-on details of design, installation, and operation. The course prepares students for the NABCEP (North American Board of Certified Energy Practitioners) Entry Level PV exam. 2 hrs. instructional lab/wk.