



## BUILDING ENERGY TECHNOLOGIES CERTIFICATE PROGRAM

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**TOTAL CREDIT HOURS:**  
Eighteen (18) credits

**PROGRAM LENGTH:**  
Six (6) courses

**PROGRAM DESCRIPTION:** This is a program of study that will be examining concepts and theory, and providing experiential application of energy efficiency and renewable energy systems in the building construction and retrofit industry, leading to more energy efficient and lower cost operations of structures and facilities.

**PROGRAM CLIENTELE:** Building owners and operators, construction tradesmen and contractors, engineering and environmental consultants, building inspectors, real estate agents and architects.

**PROGRAM OBJECTIVE:** The participant will receive the background, skill, and knowledge to review, assess, implement, audit, optimize, and operate energy efficiency and alternative energy systems within a wide range of facility types, in both new construction and retrofit situations. With an emphasis on integration of these systems into basic building functions and construction management, the participant obtains the expertise to coordinate and work effectively with architects, engineers, planners, and contractors on the installation and operation of the energy systems, and to promote those skills in the construction trades job marketplace.

### **COURSE #1-BET 200: GREEN BUILDING ENERGY SYSTEMS FUNDAMENTALS: BASIC SUSTAINABLE DESIGN & OPERATION**

**DESCRIPTION:** This three (3) credit course covers the basics of building envelopes, HVAC, lighting, installation, glazing, plumbing and electrical systems, construction materials, and the surrounding environment. The course incorporates blueprint reading, design fundamentals and focuses on construction engineering concepts. It introduces LEED and ENERGY STAR programs, relevant environmental, health and safety principles, impacts, and regulatory implications. This course provides a broad overview of energy use and efficiency in structures.

### **COURSE #2-BET 205: TECHNICAL ASPECTS OF RENEWABLE AND ALTERNATIVE ENERGY**

**DESCRIPTION:** This three (3) credit course is an introductory work-skills course on the principles, concepts, applications, and installation of renewable and alternative energy technologies as applied at the individual structure level. The course covers the utilization of renewable energy sources (solar, wind, geothermal, etc) as well as alternative technologies utilized for building operations (micro-turbines, fuel cells, combined heat and power). It is designed to prepare trades people for the installation of various technologies. There will be visits to alternative energy installations.

**COURSE #3-BET 210: RESIDENTIAL BUILDING ENERGY AND ENVIRONMENTAL SYSTEMS**

**DESCRIPTION:** This three (3) credit course details energy systems and energy efficiency technologies utilized in single and multi-family residential building types. It covers systems design and installation in both new construction and retrofit projects. It introduces field auditing techniques, environmental impacts (indoor air quality, asbestos, lead, voc's, radon, waste disposal issues, etc.), worker health & safety considerations, ENERGY STAR certification, building commissioning procedures, and local regulatory requirements. An off-site visit to a residential "green" building/construction site will be scheduled as part of this course. Writing assignments, as appropriate for the discipline, are part of the course.

**COURSE #4-BET 215: BUILDING SYSTEMS MAINTENANCE**

**DESCRIPTION:** This three (3) credit course is comprised of seven (7) energy efficiency topics in building operations and maintenance. This course will provide the participant with the basic principles, background, and skills of energy utilization, efficiency, and conservation with respect to building maintenance and operation, and the fundamentals of various building systems and equipment.

**COURSE #5-BET 220: COMMERCIAL, INDUSTRIAL, AND HIGH-RISE BUILDING ENERGY AND ENVIRONMENTAL SYSTEMS**

**DESCRIPTION:** This three (3) credit course covers the types of energy systems and energy efficiency technologies in use in commercial, industrial, and high-rise buildings. It includes design, installation, testing, assessment, and operation of technologies in these structures, and details the integration of system control components. It also encompasses a synopsis of environmental, health & safety for construction and post-construction activities, ENERGY STAR and LEED certification, other pertinent programs and regulatory aspects. An off-site visit to an institutional "green" building/construction site will be scheduled as part of this course. Writing assignments, as appropriate for the discipline, are part of the course.

**COURSE #6-BET 225: EQUIPMENT TROUBLESHOOTING AND MAINTENANCE**

**DESCRIPTION:** This three (3) credit course comprised of four (4) core classes in maintenance, operation, and diagnostics of electrical and HVAC systems, and two electives in system specialty topics. Writing assignments appropriate for the discipline are part of the course.