

Development of an Energy Services and Technology Program Specializing in Building Systems

**Within the Department
Of
Physics and Technology
Bronx Community College
City University of New York**

**By
Dr. Luis Montenegro
Dr. Reid Strieby**

**Renewable Energy and Efficiency Workforce Conference
A National Conference for Educators and Trainers
Hudson Valley Community College
Troy, New York
March 19 & 20, 2008**

Program Sponsorship

- ▶ **The Building Services Technology Program is a component within the Energy Services and Technology Program at B.C.C. (EST).**
- ▶ **The EST program is sponsored and funded by a \$900,000 ATE grant from the National Science Foundation (NSF).**
- ▶ **It is also supported by the Center for Sustainable Energy at B.C.C. (CSE);**
- ▶ **the CUNY Building Performance Lab, Baruch College;**
- ▶ **the NYC Chapter Association of Energy Engineers (AEE);**
- ▶ **the Building Owners and Managers Association (BOMA-NY)**
- ▶ **the Association of Energy Service Professionals;**
- ▶ **and Local 94 of the International Union of Operating Engineers.**

Program Summary

- ▶ **The Building Services Technology Program (BST) establishes an A.A.S. degree in BST and a series of continuing education certificate courses.**
- ▶ **Both the degree and the non-degree certificate programs will provide training in energy assessment (for auditors and analysts), operations and maintenance (for building operators/building technicians), resource management (for energy managers, energy cost analysts and measurement verification technicians).**
- ▶ **The BST program is designed to meet the needs of real estate, property management, utility and energy services, construction, equipment operators and maintenance, and performance contracting industries.**

Purpose and Goals

- ▶ **Within the Building Services component of the EST program the primary goal is to prepare and graduate students with the technical skills and scientific expertise to work as technicians in the energy services industry, which will launch new career pathways for them and address critical needs for skilled technicians on the local and national level.**
- ▶ **Technicians entering the field become members of a team working under the supervision of more experienced technicians or engineering personnel.**
- ▶ **Technicians will work in engineering, property management, maintenance, construction, customer services and marketing. They are also employed by utility companies, contractors, builders, government agencies, new technology firms and building automation system suppliers.**

Development of the Planning Program and Curriculum Development

- ▶ **A full DACUM* process, facilitated by Kirk Laflin (PETE), solicited the advice of 25 professionals in a variety of areas in the building services field who made recommendations on knowledge and skills needed by students entering into the field of Building Science Technology.**
- ▶ **Interviews were conducted with Energy Engineers, Building Owners and Managers, Operating Engineers (Local 94) and Academic Faculty within various Architecture and Engineering Departments at CUNY, The Pratt Institute and Cooper Union College to review proposed course offerings.**
- ▶ **A professional engineer with over 25 years experience in the building services industry was hired to develop specific BST curricula at B.C.C. and teach within the program.**

**www.dacum.org*

Building Services Technology Course Approval Process

- ▶ **A Letter of Intent and Proposal for the Energy Services and Technology Program (including the BST component) for an Applied Science Degree (A.A.S) was prepared for review.**
- ▶ **All seven new BST courses were approved by the College Curriculum Committee.**
- ▶ **The BCC College Senate also approved the BST courses.**
- ▶ **In addition, the Board of Trustees at CUNY approved both the BST program and courses.**
- ▶ **The EST program was approved by the New York State Department of Education in July 2007.**

Building Services Technology Curriculum

- ▶ **Students in the BST program must complete a total of 60 credit hours for graduation.**

- ▶ **Students have to complete between 19-21 credit hours as core requirements in general education; 20-22 hours in required areas of study in math, engineering and science and 19 credit hours in specialized requirements related to Building Sciences.**

- ▶ **The specialization requirements in BST are**
 - 1. Introduction to Energy Technology (2 cr.)**
 - 2. Energy Analysis of Mechanical and Electrical Equipment (2 cr.)**
 - 3. Principles of Energy Management I (3 cr.)**
 - 4. Building Systems I (3 cr.)**
 - 5. Energy Economics (3 cr.)**
 - 6. Building Systems II (3 cr.)**
 - 7. Principles of Energy Management II (3 cr.)**

Total 19 credits

ENERGY SERVICES AND TECHNOLOGY PROGRAM – COURSES BY SEMESTER

(60 Credit Hours Required for A.A.S. Degree)

First Semester			Second Semester			Third Semester			Fourth Semester		
COURSE			COURSE			COURSE			COURSE		
No.	TITLE	Cr	No.	TITLE	Cr	No.	TITLE	Cr	No.	TITLE	Cr
ENG 10 or ENG 11	Fundamentals of Composition and Rhetoric or Composition and Rhetoric I	3	CMS 11	Fundamentals of Interpersonal Communication	3	ENG 23	Scientific and Technical Writing	3	CMS 12	Voice and Diction: Business and Professional Speech	2
MTH 13*	Trigonometry and College Algebra	3	MTH 23	Probability and Statistics	3	HIS 10 or HIS 11	History of the Modern World Or Introduction to the Modern World	3	ENV 11 CHM 11	Introduction to Environmental Health or General College Chemistry I	4
ELC 15	Computer Applications in Technology	2	BUS 10 Or BUS 51	Introduction to Business or Business Organization and Management	3	ECO 11 or ECO 12	Microeconomics Or Macroeconomics	3	EST EE	Energy Economics	3
PHY 21	Physics for Engineering Technology I	4	ELC 11	DC Circuit Analysis	4	EST CC	Principles of Energy Management I	3	EST FF	Building Systems II	3
EST AA**	Introduction to Energy Technology	2	EST BB	Energy Analysis of Mechanical and Electrical Equipment	2	EST DD	Building Systems I	3	EST GG	Principles of Energy Management II	3
OCD 01	Orientation and Career Development	0	Restricted Elective ***		1						
SEMESTER TOTALS		14			16			15			15
*Students planning on transferring to a 4-yr program may substitute MTH 30 and MTH 31 for MTH 13 and MTH 23.									PROGRAM TOTALS		60
New Courses in Bold * Choose from ART 10, MUS 10, any PEA one credit course, CPR 10, or WFA 10.											

Non-Credit BST Courses and Education Outreach Initiatives

- ▶ **Non-credit certificate courses in BST have been developed for the Building Systems I course and Principles of Energy Management I course. These courses are divided into (3) modules. We are also developing Building Systems II and Principles of Energy Management II courses in the same format. Non-credit courses of this type produce the basis for a building systems certificate program.**
- ▶ **Non-credit BST certificate courses will be offered in the fall of 2008 through the B.C.C.'s Center for Sustainable Energy.**
- ▶ **Plans are underway to offer BST credit courses at other units of CUNY under the auspices of the CUNY Task Force on Sustainability.**