



## Course Number and Title: NRG 209 BAS Cooperative Education

**Campus Location:**

Georgetown, Dover, Stanton

**Effective Date:**

2018-51

**Prerequisite:**

NRG 123, NRG 126, NRG 140

**Co-Requisites:**

none

**Course Credits and Hours:**

3.00 credits

0.00 lecture hours/week

9.00 lab hours/week

**Course Description:**

This course provides students with practical experience in the building automation field.

**Required Text(s):**

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

**Additional Materials:**

None

**Schedule Type:**

Classroom Course

**Disclaimer:**

Students will work in a building automation related cooperative education position for a minimum of 144 hours.

**Core Course Performance Objectives (CCPOs):**

1. Apply technical skills needed in the building automation industry as they relate to assigned position. (CCC 1, 2, 3, 4, 5, 6; PGC 1, 2, 5, 6, 7)
2. Perform duties of a building automation technician as required in the assigned position. (CCC 1, 2, 4, 5, 6; PGC 1, 2, 3, 5, 6, 7)
3. Apply proper care and safety techniques while performing all activities. (CCC 1, 3, 4; PGC 5)
4. Apply appropriate aspects of the mathematics, science, and environmental disciplines as required in the assigned position. (CCC 2, 4, 5, 6; PGC 1, 2, 3, 5, 6, 7)
5. Identify and document building automation activities related to the assigned position. (CCC 1, 2, 3, 5, 6; PGC 4)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

**Measurable Performance Objectives (MPOs):**

Upon completion of this course, the student will:

1. Apply technical skills needed in the building automation industry as they relate to the assigned position.
  1. Perform building automation tasks as required by the assigned position.
  2. Distinguish proper application of trade methods required for task(s) assigned.
  3. Demonstrate accurate information of building system data.
  4. Identify technological modifications necessary to improve energy efficiency.
  5. Employ data trending and analysis as required by proper to evaluate system operation.
2. Perform duties of a building automation technician as required in the assigned position.
  1. Use proper techniques to perform necessary wiring tasks.
  2. Install sensors and other components to manufacturer's specifications.
  3. Identify and label control panels as required by the cooperative education assigned position.
  4. Document work activities as required by the cooperative education employer.
3. Apply proper care and safety techniques while performing all activities.
  1. Demonstrate proper use of all tools required in the work environment.
  2. Employ safe operation practices and methods.
  3. Identify proper tool calibration processes to ensure safety.
4. Apply appropriate aspects of the mathematics, science, and environmental disciplines as required in the assigned position.
  1. Collect and share information in an approved format.
  2. Using appropriate tools and software, tabulate and analyze trends in data collected.
  3. Implement proper control strategies as determined by the demands of the workplace.
5. Identify and document building automation activities related to the assigned position.
  1. Maintain a journal of activities, problems, terminology, and possible solutions.
  2. Prepare and present a detailed report summarizing the experience.

**Evaluation Criteria/Policies:**

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

**Core Curriculum Competencies (CCCs are the competencies every graduate will develop):**

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

**Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):**

1. Utilize building system and energy technology hardware and software to gather data on building lighting systems operation and energy consumption.
2. Utilize building system and energy technology hardware and software to gather data on heating, ventilation, and air conditioning (HVAC) systems operation and energy consumption.
3. Evaluate commercial buildings and make recommendations for optimized building performance and occupant comfort.
4. Prepare and present technical reports.
5. Assemble, install, service, and repair direct digital controls (DDC) for building electrical and mechanical systems.
6. Program and explain operational sequences for building equipment and systems.
7. Integrate and commission building systems and components to ensure reliable performance and compliance with building codes.

**Disabilities Support Statement:**

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.