BUAS 1040
COURSE

GEORGIA PIEDMONT TECHNICAL COLLEGE
INDUSTRIAL & TRANSPORTATION TECHNOLOGIES

Building Automation Systems Program

BUAS 1040 Building Automation Systems Devices

Courtesy of National Science Foundation – BEST Center
www.BESTctr.org

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BUILDING AUTOMATION SYSTEMS FUNDAMENTALS

Course Documentation

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Industrial & Transportation Technologies Division
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Table of Contents

Catalog description

Building Automation Systems (BAS) Devices covers the major types of peripheral components found in BAS systems and how to properly select and apply them in the field. Topics include standard I/O wiring, temperature devices, humidity devices, pressure devices, flow devices, life & equipment safety devices, actuators & dampers, control valves, power supply devices, transducers, relays & contactors, motor controls, enclosures, and power monitoring devices.

Lecture Hours: 28

Laboratory Hours: 46

Units

Semester Credit Hours: 3

Entry skills needed

- BUAS 1020 – Building Automation Systems Electrical Concepts I
- Basic computer skills
- College-level reading and writing skills
- College-level math skills

Syllabus

See Appendix A for sample syllabus, course schedule, and policies. For lesson topics to include in course, see Exit Skills.

Student learning outcomes

The exit skills listed in the next section support these outcomes:

Standard Input & Output Wiring

Develop an understanding of the way inputs and outputs in BAS are wired.

Engineering Data Sheets

Interpret product data sheets and understand what information is provided and its typical location.

Temperature Devices

Understand the types and functions of temperature devices commonly used in the BAS industry.

Humidity Devices

Understand the types and functions of humidity devices commonly used in the BAS industry.

Pressure Devices

Understand the types and functions of pressure devices commonly used in the BAS industry.

Flow Devices

Understand the types and functions of flow devices commonly used in the BAS industry.

Life & Equipment Safety Devices

Understand the types and functions of life & equipment safety devices commonly used in the BAS industry.

Actuators & Dampers

Understand the types and functions of actuators & dampers commonly used in the BAS industry.

Control Valves

Understand the types and functions of control valves commonly used in the BAS industry.

Power Supplies

Understand the types and functions of power supplies commonly used in the BAS industry.

Transducers

Understand the types and functions of transducers commonly used in the BAS industry.

Relays & Contactors

Understand the types and functions of relays and contactors commonly used in the BAS industry.

Motor Controls

Understand the types and functions of motor controls commonly used in the BAS industry.

Enclosures

Understand the types and functions of enclosures commonly used in the BAS industry.

Power Monitoring Devices

Understand the types and functions of power monitoring devices commonly used in the BAS industry.

Exit skills

Course content to achieve outcomes listed above:

Standard Input & Output Wiring

1. Describe all the industry standard types of inputs in building automation systems.
2. Describe all the industry standard types of outputs in building automation systems.
3. Draw all building automation systems standard input and output circuits from memory.
4. Observe an instructor properly wire standard building automation systems inputs & outputs.
5. Construct standard building automation systems input and output circuits and test for proper operation.

Engineering Data Sheets

1. Interpret data sheet information.
2. Accurately select products based on application, environment, power requirements, and price.
3. Download .pdf engineering data sheets and highlight appropriate options for use in a submittal package.

Temperature Devices

1. Explain the differences between thermistors, thermocouples, and RTD sensors.
2. Discuss the proper location, installation, and application of the following temperature devices: room sensors, duct sensors, immersion sensors, outside air sensors, averaging sensors, transmitters, and infrared transmitters.
3. Compare and contrast various thermistor types.
4. Install various temperature sensing devices into an existing building automation system with instructor supervision.
5. Select the appropriate temperature device to suit an instructor-given application.

Humidity Devices

1. Examine various humidity sensors and classify them into different groups based on characteristics.
2. Integrate various humidity sensors into an existing building automation system under instructor supervision.
3. Select the appropriate humidity device to suit an instructor-given application.

Pressure Devices

1. Cite various applications for pressure devices.
2. Categorize various pressure devices according to their function.
3. Integrate various pressure devices into an existing building automation system under instructor supervision.
4. Select the appropriate pressure device to suit an instructor-given application.

Flow Devices

1. Discuss the various types of flow devices available for building automation systems.
2. Compare and contrast the various flow devices and the means by which they sense flow.
3. Integrate a given flow device into an existing building automation system.
4. Select the appropriate flow device to suit an instructor-given application.

Life & Equipment Safety Devices

1. Describe what types of devices are included in the category of life and equipment safety.
2. Integrate provided life and equipment safety devices into an existing building automation system under instructor supervision.
3. Select the appropriate life and equipment safety devices to suit instructor-given applications.

Actuators & Dampers

1. Describe actuator terms such as torque, auxiliary switches, drive time, reverse & direct-acting, throttling range, feedback, two-position, tri-state, and modulating.
2. Draw a circuit diagram showing how two-position, tri-state, and modulating actuators should be wired for proper operation.

3. Explain damper terms such as blades, blade seals, jamb seals, leakage, frame, control shaft, bearing, parallel blade, and opposed blade.

4. Observe an instructor mounting and wiring an actuator on a damper.

5. Demonstrate the ability to correctly mount and wire an actuator on a damper shaft and then properly wire the actuator to an existing building automation system under instructor supervision.

6. Select and size a damper and damper actuator properly to suit an instructor-provided application.

Control Valves

1. Explain the characteristics of ball valves, butterfly valves, globe valves, solenoid valves, and zone valves.

2. Describe the proper methods for selecting a control valve.

3. Select an appropriate control valve for adequate controllability based upon instructor-provided parameters.

4. Observe an instructor installing a sweat-in and a threaded control valve into a loop.

5. Demonstrate the ability to add a given sweat-in and threaded control valve into an existing loop and integrate it properly into an existing building control system to control flow.

Power Supplies

1. Discuss various types of power supplies used in typical building automation systems.

2. Observe an instructor installing a DC power supply to power a 4-20 milliamp transmitter device.

3. Wire a circuit with a 4-20 milliamp transmitter which is powered by a DC power supply under instructor supervision.

4. Select a power supply to suit an instructor-provided application.

Transducers

1. Define the term transducer.

2. Give examples of various transducers commonly used in building automation systems.

3. Categorize a list of given transducers into groups which serve common building automation functions.

4. Select the transducers which match instructor-given applications.

Relays & Contactors

1. State the differences between the following classes of relays: board-mounted, general purpose plug-ins, power relays, timing relays, solid-state relays, alternating relays, mechanically-held relays, and latching relays.

2. Compare and contrast relays, contactors, and starters.

3. Select the relays and contactors appropriate for instructor-given applications.

Motor Controls

1. Summarize the purpose and operation of variable frequency drives.

2. Draw a circuit depicting a motor starter complete with overload heaters and auxiliary switches.

3. Observe an instructor demonstrating the features of a variable frequency drive controlling an air-handling unit fan.

4. Perform proper start-up procedures for a given frequency drive.

Enclosures

1. Explain the purpose of the NEMA rating system for enclosures and cite several of the numbers and what they represent.

2. Choose the correct enclosure NEMA rating for a given application.

3. Observe an instructor mount and install din rail and wire duct in an enclosure.

4. Size and select an enclosure to suit an instructor-given application.

Power Monitoring Devices

1. Define the functions of current operated switches, current transducers, voltage transducers, power-monitoring transducers, surge protection, potential transformers, split-core transformers, and current transformers.

2. Select the proper power-monitoring devices for an instructor-given application.

3. Observe an instructor demonstrate the proper use and configuration of a watt-transducer.

4. Observe an instructor connect various power-monitoring transducers into an existing building automation system.

5. Demonstrate the ability to install and configure a watt-transducer under instructor supervision.

Course materials

Principal text

Kele Corporation Catalogue and website @ www.kele.com

Lecture materials and handouts

This course is strictly an overview course and makes significant use of online resources:

DDC Online (Digital controls tutorials):
www.ddc-online.org

Purdue Owl writing & style resources: https://owl.english.purdue.edu

Presentation tools by Prezi: www.prezi.com

Kele website: www.kele.com

Control Specifications Builder: www.ctrlspecbuilder.com

Other reference materials

None required

Software needed

None required

Lab setup and materials

- Workstations with electrical outlets
- DC power supplies of various sizes
- Transformers of various sizes and types
- Electromechanical relays (SPDT, DPDT)
- 14, 16, & 18 gauge THHN wire of various colors
- Wire strippers
- Control screwdrivers / regular size screwdrivers
- Electrical tape
- Assorted resistor types & values
- LED & 24 volt DC indicator lights
- Pushbutton switches
- Thermistors and RTDs of various types and ranges

- Control valve variations
- Actuators of various sizes and configurations
- Parallel and opposed blade dampers
- Humidity sensors
- Flow-sensing devices and meters
- Watt transducers
- Enclosures of various NEMA ratings
- Variable frequency drives
- Life safety devices and indicators

Equipment & instruments required

- Torque gauge
- Multi-meter & clamp-on meter
- Voltage proximity sensor
- Scopemeter
- Oscilloscope

Samples of weekly assignments

BUAS 1040 – BAS Devices Assignment # 1 – Kele KA-44-M Actuator Investigation

Location: GPTC BAS Laboratory

Purpose: Gain a familiarity with Kele actuators, DC power supplies, and the meaning of terms like stroke, torque, direct-acting, reverse-acting, modulating, and proportional as they relate to actuator control.

Materials:

- 120/24 Volt, 40 VA transformer
- Kele DCP 1.5Watt DC power supply
- Kele KA-44-M actuator
- Multi-meter
- Wire strippers
- Terminal strip
- Wire connectors
- Safety goggles
- Paper and pad for recording data

Description: Students work two per workstation which has all the materials listed above.

Students take turns wiring up the 120/24V transformer to terminals 1 & 2 on the actuator, and to the 24V AC terminals on the DCP 1.5W power supply. From the DC terminals on the power supply, students wire to the appropriate terminals on the actuator, with the positive wire landing on terminal 3 of the actuator.

Once each student has properly wired the transformer, DC power supply, and the KA-44-M actuator, and been checked off by the instructor, the data gathering portion of the laboratory begins.

One student will be the experimenter, while the other records the data. With the actuator action switch in the direct-acting position, the DC voltage will be adjusted with a control screwdriver until the actuator reaches the positions of 0, 30, 45, 60, and 90 degrees, with the associated DC voltage signals recorded at each position by the student who is recording the data.

The experiment will be repeated with the actuator action in the reverse-acting position and the students changing roles (the previous experimenter is the data-collector, while the previous data-collector is the experimenter). Data is again recorded as to signal levels at the 0, 30, 45, 60, and 90 degree actuator positions. Once the second set of data is recorded, power will be turned off, all wiring will be removed and collected in the wire box for future use, and all components will be returned to their appropriate location on the workbenches.

Each student group will develop an experiment report in Microsoft Word which includes the sections of description, hypothesis, materials, methods, data/results, and conclusions for submittal to dropbox in Angel LMS. In the conclusion, students should include definitions of stroke, torque, direct-acting, reverse-acting, proportional, and modulating as they relate to actuator control.

A sample report format is available as a template in Angel.

Students may submit one report per group.

Grading: Grading is based on completeness of the report, conclusions drawn, format, neatness, and participation. A rubric is available in Angel LMS for review.

Project

BUAS 1040 – BAS Devices Course Project Assignment – Product Selection Packet

Location: Online

Purpose: To learn how to select suitable products and highlight the appropriate option selection on an engineering data sheet and organize the data sheets into a packet.

Materials: No materials needed

Description: This is an individual assignment where students will log in to Control Specifications Builder (www.ctrlspecbuilder.com) and enter the assigned parameters in specifying a variable air volume system with the points listed in the assignment.

Once the specifications have been generated for the system, the student will select products from the Kele website (www.kele.com) to satisfy the specifications.

Each engineering data sheet selected will be highlighted as to the specific options of the product to be used. A written justification should be written with each data sheet explaining how the selected product satisfies the control specifications.

The engineering data sheets will be organized in alphabetic order into a packet for submission at the end of the term.

Grading: Grading will follow the rubric found in Angel LMS. Elements of the grading include project completeness, accuracy, following directions, and neatness.

Assessment

Methods

- Discussion board participation (each week in Angel learning management system)
- Homework – pre-lab completion prior to class
- Classroom participation & attendance
- Quizzes (12) – delivered through Angel learning management system & due by Sunday night of each respective week
- Course exams (2, mid-term & final exams) – delivered through Angel learning management system & due by Sunday night of each respective week
- Student team presentations (1 at term end, using Prezi) – presenting their project findings
- Course project (1 assigned at mid-term) – turned in prior to student team presentations at the end of the term

Sample test questions

From final exam:

1. Please select all the sections that are commonly found on an engineering data sheet. You may select more than one.
   - ☐ Features
   - ☐ Ordering information
   - ☐ Specifications
   - ☐ Commissioning procedures
   - ☐ Description
   - ☐ Return instructions

2. Describe the primary differences between thermistors and RTDs and cite an application for each.

3. For a control valve configured as direct-acting, an increase in signal voltage corresponds with _____.

- ☐ Valve closing
- ☐ Valve opening
- ☐ Valve torque
- ☐ Valve power

4. For a control valve configured for tri-state operation, the valve can be resting in a position, _____, or _____.

- ☐ Half open, fully open
- ☐ Driving to mid-range, driving to fully closed
- ☐ Driving open, driving closed
- ☐ Modulating, closed

Adaptability to on-line format

Much of this course content can be delivered online with links to soft skills videos, manufacturer's presentations, tutorials, wholesaler websites, and others.

Appendix A – Sample syllabus

Georgia Piedmont Technical College
BUILDING AUTOMATION SYSTEMS DEVICES
COURSE BUAS 1040 CRN 48939
SEMESTER Fall, 2011
OUTLINE, SYLLABUS,& ORIENTATION INFORMATION

FACULTY INFO

Mr. Brian Lovell
Clarkston C-13

Email: lovellb@dekalbtech.edu
Phone: 404-297-9522 Ext.: 1265

Office Hours: M, T 9:00-noon (by appointment)

Division Chair :Natalie Kostas,

Email: kostasn@dekalbtech.edu
Phone: 404-297-9522 Ext.: 1216

Campus Office Number

CLASS TIMES

Monday / Wednesday 8:30 pm - 9:45 pm

CREDIT HOURS & PREREQUISITES

3 / BUAS 1020 (Corequisite)

INTRODUCTION & COURSE DESCRIPTION

See above

COURSE COMPETENCIES

See above

STUDENT LEARNING OUTCOMES

See above

TEXTBOOK TITLE (required)

Kele Catalogue

OTHER TEXTBOOK INFORMATION

N/A

ADDITIONAL RESOURCES

Throughout the semester, additional resources may be used. They may include the Internet, newspapers, and professional publications.

EVALUATION

Discussion Board Activity……10%

Classroom Participation……10%
Homework Assignments..……20%
Weekly Quizzes….....10%
Course Assessments…….….20%
Written Final…….15%
Course Project……...15%

SCHEDULE

8/29 - Introduction | Homework: Go to the Kele website at www.kele.com and read about history & culture of Kele & also review Thermostats & Controllers section under the Product Categories

9/5 - Labor Day Holiday

9/7 - Lab 1 - (Pre-lab on Angel LMS)

9/12 - Lecture: Thermostats & Controllers | Homework: Review Temperature Sensors & Transmitters section
Quiz 1 - Due Sunday, 9/18 NLT 11:55pm (Thermostats & Controllers)

9/14 - Lab 2 - (Pre-lab on Angel LMS)

9/19 - Lecture: Temperature Sensors & Transmitters | Homework: Review Tools& Test Equipment section
Quiz 2 - Due Sunday, 9/25 NLT 11:55pm (Temperature Sensors & Transmitters)

9/21 - Lab 3 - (Pre-lab on Angel LMS)

9/26 - Lecture: Tools & Test Equipment | Homework: Review Relays & Contactors section
Quiz 3 - Due Sunday, 10/2 NLT 11:55pm (Tools & Test Equipment)

9/28 - Lab 4 - (Pre-lab on Angel LMS)

10/3 - Lecture: Relays & Contactors | Homework: Review Access Control section
Quiz 4 - Due Sunday, 10/9 NLT 11:55pm (Relays & Contactors)

10/5 - Lab 5 - (Pre-lab on Angel LMS)

10/10 - Lecture: Access Control | Homework: Review Actuators & Dampers section
Quiz 5 - Due Sunday, 10/16 NLT 11:55pm (Access Control)

10/12 - Lab 6 - (Pre-lab on Angel LMS)

10/17 - Lecture: Actuators & Dampers | Homework: Review Alarms & Indication section
Mid-term Assessment - Due Sunday, 10/23 NLT 11:55pm (All material covered through 10/17 lecture)

10/19 - Lab 7 - (Pre-lab on Angel LMS)

10/24 - Lecture: Alarms & Indication | Homework: Look through Control Valves
Quiz 6 - Due Sunday, 10/30 NLT 11:55pm (Alarms & Indication)

10/26 - Lab 8 - (Pre-lab on Angel LMS)

10/31 - Lecture: Control Valves | Homework: Look through Electrical Wiring Materials
Quiz 7 - Due Sunday, 11/6 NLT 11:55pm (Control Valves)

11/2 - Lab 9 - (Pre-lab on Angel LMS)

11/7 - Lecture: Electrical Wiring Materials | Homework: Look through Enclosures
Quiz 8 - Due Sunday, 11/13 NLT 11:55pm (Electrical Wiring Materials)

11/9 - Lab 10 - (Pre-lab on Angel LMS)

11/14 - Lecture: Enclosures | Homework: Look through Flow
Quiz 9 - Due Sunday, 11/20 NLT 11:55pm (Enclosures)

11/16 - Lab 11 - (Pre-lab on Angel LMS)

11/21 - Lecture: Flow | Homework: Look through Gas and Specialty Sensors
Quiz 10 - Due Sunday, 11/27 NLT 11:55pm (Flow)

11/23 - Lab 12 - (Pre-lab on Angel LMS)

11/28 - Lecture: Gas & Specialty Sensors | Homework: Humidity
Quiz 11 - Due Sunday, 12/4 NLT 11:55pm (Gas & Specialty Sensors)

11/30 - No class (Thanksgiving)

12/5 - Lecture: Humidity | Homework: Look through Level
Quiz 12 - Due Sunday, 12/11 NLT 11:55pm (Humidity)

12/7 - Lab 13 - (Pre-lab on Angel LMS)

12/12 - Lecture: Level / Review for Final Exam

12/14 - Final Assessment - Due Wednesday, 12/14 NLT 12:00pm (noon) - No Exceptions or Extensions
Course Project - Due Wednesday, 12/14 NLT 12:00pm (noon) - No Exceptions or Extensions

COLLEGE POLICIES

GRADING

It is the responsibility of the student to maintain a record of all grades. All final grades will be recorded as letter grades based on GPTC's grading system: **A=90-100, B=80-89, C=70-79, D=60-69, F=below 60**

STUDENT RESPONSIBILITIES

The student is expected to complete all assigned readings in a timely manner so he/she can fully participate in discussions and activities. Students are expected to maintain a record of their grades in the course. The student is expected to participate in discussions or discussion boards and meet deadlines.

CLASS POLICIES

Class policies concerning work ethics, plagiarism, and other academic issues may be found on GPTC's student handbook web page.

CHEATING / PLAGIARISM POLICY

Cheating includes any attempt to defraud, deceive, or mislead the instructor in arriving at an honest grade assessment. Plagiarism involves presenting the ideas or work of another person as being one's own. Violations of cheating may result in a lowered grade on a portion of the course or a grade of "F" in the course. A grade assigned to a student because of an alleged cheating or plagiarism violation may be appealed by the student through the appeals process. A student found to have violated the cheating/plagiarism policy more than one time, in addition to having a grade or grades lowered, may be referred to the appropriate administrator for further sanctions.

ATTENDANCE& WITHDRAWALS

Attendance

Students enrolled in college programs are preparing themselves for direct entry into gainful employment. Employers state that the main characteristic sought in potential employees is dependability and punctuality. Therefore, the importance of student attendance is emphasized at Georgia Piedmont Technical College, and all students are expected to be present and prompt for all class sessions. Absent or present, students are responsible for all assigned work in each class. Missing more than ten percent (10%) of class time in a lecture setting can adversely affect the student's success in a course due to the missed opportunity of information from and interaction with faculty and classmates. Also, missing assignments as a result of tardiness or absences will have a detrimental effect on a student's final grade. Due to the varied demands of individual programs, some classes may have specific attendance requirements.

Student – Initiated Withdrawal

If it becomes necessary to withdraw from a course, the student must confer with the instructor, Students must complete and return a Withdrawal Form in-person to the Registrar's Office or online. Go to www.dekalbtech.edu →Student Services →Registrar →Withdrawal →Withdrawal Form.
The withdrawal form must be completed and returned/submitted to the Registrar's Office. The day the competed form is received by the Registrar's Office is the official date of withdrawal. Students who do not formally withdraw from a class(es) are liable for all tuition, fees, and associated expenses.

A student-initiated withdrawal through the Registrar's Office by the mid-point of a course will receive a grade of "W". A student who withdraws him/herself after the mid=point and before the final week of classes will receive a "W" if passing or a "WF" if failing. A student cannot withdraw him/herself from a course during the final week of the term.

Faculty-Initiated Withdrawals

Faculty will withdraw a student from a course if the student fails to meet either the *"No Show"* or the "*Participation (10% Rule)"* requirements as outlined below. Faculty must report these students in order to comply with Federal Financial Aid regulations and ensure students receive the financial aid to which they are entitled.

"No Shows"
Any student whose name appears on the Banner Web class roster who has not participated in class activities during the first seven (7) days of the term will be reported as a "no show" through the electronic No Show Program. Once reported as a "no show," the student will be removed from the faculty's Banner Web class roster and unable to participate in class for the remainder of the term. To avoid being reported as a no show, students must participate during the first week as follows:

1 Lecture Class: Students must participate in at least one class meeting during the first seven (7) days of the term.
2. Online Class: Students must log into the DTC official Learning Management System (currently ANGEL) at least twice during the first seven (7) days of the term. Participation is recorded when the student clicks on the link into the specific class.
3. Hybrid Class: Students must log into the DTC official Learning Management System (currently ANGEL) at least twice or participate in at least one class meeting during the first seven (7) days of the term.

Participation (10% Rule)
Faculty will withdraw a student at the course mid-point and assign a "W" for the student's final grade if the student meets one of the following criteria which demonstrates a lack of interest in participating for the remainder of the term:

1 Lecture Class: A student misses ten percent (10%) of in-class meetings. A student's tardiness is included in this percentage; two instances of arriving late or leaving early will equate to missing one in-class meeting.
2 Hybrid or Online Classes: A student fails to log into class and/or does not submit work for a consecutive two-week period.

No faculty will withdraw students after the course mid-point. A student must formally contact the Registrar's Office to initiate a withdrawal after the mid-point; otherwise, he or she will receive the grade earned by the end of the term.

MISSION STATEMENT

Georgia Piedmont Technical College, a unit of the Technical College System of Georgia, promotes a student-centered environment for lifelong learning and development, encompassing academic and technical education for employment in a global community.

COMMUNICATION

At the end of the semester, the student is expected to complete a faculty evaluation for this course.

A student is to only use their GPTC email when communication with GPTC faculty and staff. Emails sent to the instructor should include the following information in the subject line: the course, the students' full name, 900 number, and the purpose of the email.

HOPE INFORMATION

There are numerous changes to HOPE that will affect every student. For complete details and to view all hours counted, please visit the Georgia Student Finance website at www.gsfc.org. Students can log on to this website by using their social security number and date of birth or contact the Financial Aid office.

TECHNICAL SUPPORT

Technical support for On-line courses is available at (404) 297-9522. On-line course support is provided by Michelle Murphy or Sandra Clapper. The email address for technical support is dekalbonline@dekalbtech.edu.

Technical support for BannerWeb, GPTC e-mail, and computer labs is available @ (404) 297-9522 ext. 5399 or by e-mail at techsupport@dekalbtech.edu.

SPECIAL SERVICES (ADA ACCOMMODATIONS/504)

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Special Services Office at 404/297-9522, ext. 1155 for an appointment. Please contact Special Services as soon as possible to better ensure accommodations are implemented in a timely manner.

TITLE IX – CLERY ACT

- As set forth in our student catalog Georgia Piedmont Technical College does not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, political affiliation or belief, veteran status, or citizenship status (except in those special circumstances permitted or mandated by law.
- Title IX Coordinator, Dr. Debra Gordon, Dean of Academic Support, Georgia Piedmont Technical College, Building A, Room 103, 495 North Indian Creek Drive, Clarkston, Georgia 30021, Phone: (404) 297-9522 x 1176. Grievance procedures providing for resolution of alleged student discrimination under these Acts may be obtained from the Title IX Coordinator at the Clarkston Campus.
- Georgia Piedmont Technical College is committed to assisting all members of the GPTC community in providing for their own safety and security. The annual security safety compliance document is available on the GPTC website.

The website contains information regarding campus safety and security including topics such as: crime prevention, vehicle registration, physical security, safety suggestions, reporting procedures, drug and alcohol policies, crime statistics – *Clery Report* and sexual assault incidents. The *Clery Report* contains information about crime statistics for the three previous calendar years concerning reported crimes that occurred on campus; in certain off-campus buildings or property owned or controlled by GPTC; and on public property within, or immediately adjacent to and accessible from campus. This information is required by law and is provided by the Georgia Piedmont Technical College Police Department.

WORK ETHICS

Work ethics is an integral component of programs offered at GPTC. Work ethics traits include: productivity, teamwork, character, attendance, leadership, organization, communication, respect, self-esteem, and appearance.

NON-DISCRIMINATION

It is the policy of Georgia Piedmont Technical College not to discriminate on the basis of race, color, religion, sex, national origin, age, academic or economic disadvantage or disability.

OFFICE ETIQUETTE

Many instructors share an office or suite with other instructors. Please do not interrupt other instructors when visiting a shared office. Office hours for instructors are posted on their doors. Students are encouraged to make an appointment whenever possible.

LAB& CLASSROOM PROCEDURES

The following are not allowed in the classroom/lab: food, drinks, and headsets. Cell phones will be set to mute and there will be not texting. The student may not use computer labs for sending personal e-mails or for downloading any software program not already established on the main menu screen by Georgia Piedmont Technical College. Computers are to be used only for academic purposes.

The student will keep a neat workstation by placing all book bags and other items not needed for class underneath workstations and out of aisles. Chairs are to be pushed underneath workstations at the end of each class session and equipment returned to its original position. All trash should be discarded. Students should report unsafe or damaged equipment to the instructor. Lab hours are posted in each computer lab.

SAFETY& EMERGENCIES

Safety, emergency, and evacuation procedures are posted in each classroom.

TECHNICAL COLLEGE SYSTEM OF GEORGIA GUARANTEE

The Technical College System of Georgia offers the following guarantee to business and industry partners: "If one of our graduates was educated under a standard program, and his/her employer agrees the employee is deficient in one or more competencies as defined by the standards, the technical college will retrain that employee at no instructional cost to the employee or employer."

BEST Center Curricula, Resources & Recordings

Academic Programs
Georgia Piedmont Technical College - Building Automation Systems
Milwaukee Area Technical College - Sustainable Facilities Operations
Laney College - Commercial HVAC Systems
City College San Francisco - Commercial Building Energy Analysis & Audits

Professional Development Materials, Presentations & Videos
National Institutes
Building Automation Systems Instructor Workshops
Webinars (e.g., BEST Talks)

Faculty Profile Videos
Reports & Case Studies
Marketing Resources

BEST
Building Efficiency for a Sustainable Tomorrow

NSF National Science Foundation