**BUAS 1030 COURSE**

GEORGIA PIEDMONT TECHNICAL COLLEGE
INDUSTRIAL & TRANSPORTATION TECHNOLOGIES

Building Automation Systems Program

# BUAS 1030 Building Automation Systems
# Electrical Concepts II

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

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.


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# Table of Contents

# Catalog description

Building Automation Systems (BAS) Electrical Concepts II continues the development of electrical fundamentals begun in BAS Electrical Concepts I. Topics covered include power supplies, reactive electrical components, power distribution, circuit protection, electric motor theory, electric generator theory, types of electric motors, motor starters, switching devices, electrical symbols, pictorial diagrams, schematics, sequences of operation, and basic electrical troubleshooting.

## Class hours

Lecture Hours: 27

Laboratory Hours: 41

## 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:

## Power Supplies

Gain an understanding of DC power supplies and their application to building automation systems.

## Reactive Electrical Components

Understand how capacitive and inductive components shift waveforms and affect BAS circuits.

## Power Distribution

Understand how power is supplied to commercial buildings, how it's distributed within the building, and the most commonly encountered voltages.

## Circuit Protection

Understand the importance and purpose of circuit protection and how to check a circuit breaker panel.

## Electric Motor Theory

Understand the theory of electric motor operation.

## Electric Generator Theory

Understand the principles of generator operation.

## Electric Motor Types

Understand how to identify and wire the five most commonly encountered motor types.

## Motor Starters

Understand the function of motor starters, their importance in motor protection, and the proper way to wire them.

## Switching Devices

Understand how switching devices are used in the start/stop of motors.

## Electrical Symbols

Identify commonly used electrical symbols.

## Pictorial Diagrams

Understand the purpose of pictorial diagrams and when they're used.

## Schematic

Understand the purpose of schematics, how they're used, and what information they provide.

## Sequences of Operation

Explain the purpose of sequences of operation and their importance for system operation.

# Exit skills

Course content to achieve outcomes listed above:

## Power Supplies

1. Describe the characteristics of power supplies.
2. Discuss power supply efficiency.
3. Define the terms volt-amps, watts, amp-hours, and regulated DC voltage.
4. Calculate the size of the power supply needed for various devices which can be powered by either AC or DC.
5. Observe an instructor replacing a power supply in a circuit.
6. Demonstrate the ability to replace an existing power supply in a circuit.

## Reactive Electrical Components

1. Define what reactive components are and cite examples.
2. Describe the operation of capacitors, inductors, motors, and transformers.
3. Calculate inductive reactance and capacitive reactance given circuit information about inductors and capacitors, respectively.
4. Observe an instructor demonstrating the effect variable inductors and capacitors have on leading and lagging waveforms on an oscilloscope.

## Power Distribution

1. Describe how power is distributed from a typical power generating facility to a commercial building.
2. Discuss the voltages available in typical commercial buildings in the U.S.
3. Observe an instructor safely testing various voltages in a commercial building.
4. Perform a safe voltage test of building voltages with instructor supervision.

## Circuit Protection

1. List different types of circuit protection.

2. Explain how circuit breakers function and what their purpose is.

3. Draw a circuit diagram showing the placement of a fuse and another circuit diagram showing the placement of a circuit breaker with its associated electrical symbol.

4. Explain what a GFCI is and its function.

## Electric Motor Theory

1. Identify all the major parts of an electric motor.

2. List the five basic types of motors found in buildings and the newest type of high efficiency, electronically commutated motors.

3. Define the terms run windings, start windings, phase, torque, stator, rotor, full-load amps, running-load amps, locked-rotor amps, bearings, induction, and phase angle.

4. Describe the basic principles necessary to turn a motor shaft.

5. Consider the ways in which motors impact our daily lives.

6. Observe an instructor showing the parts of a motor on a table model.

## Electric Generator Theory

1. Label all the parts of an AC & DC generator.

2. State how electrical current can be induced in a conductor which is cutting lines of magnetic force.

3. Explain how AC generators and DC generators function.

4. Draw a diagram of an AC and DC generator.

5. Observe an instructor operate an AC generator.

6. Collaborate with classmates to develop an operable AC electrical generator which can generate 5 volts AC.

## Electric Motor Types

1. Identify unknown motor types based on construction, configuration, and components.

2. Explain the applications for basic motor types.

3. Classify motor types based upon starting and running torque.

4. Observe an instructor properly wiring each basic type of electric motor.

5. Demonstrate the ability to properly wire and start all five basic types of motors.

## Motor Starters

1. Describe various motor starter types and explain their function.

2. Discuss how motor starters are sized.

3. Outline the differences between mechanically held and electrically held starters.

4. Observe an instructor properly wiring a motor starter.

5. Demonstrate the ability to properly wire a motor starter.

## Switching Devices

1. Identify various types of switching devices.

2. Draw diagrammatic symbols representing the following types of switches: toggle, rocker, push-button, rotary, SPST, SPDT, DPST, DPDT, limit, current, pressure, and whisker switches.

3. Observe an instructor wiring switching devices into a circuit.

4. Demonstrate the ability to wire switching devices into a circuit.

## Electrical Symbols

1. Identify basic electrical symbols.

2. Classify electrical symbols into groupings of similar devices such as pressure switches, current switches, etc.

3. Draw a basic circuit diagram which includes various types of electrical devices depicted by their appropriate symbols.

## Pictorial Diagrams

**1.** Define the term pictorial diagram and explain its purpose.

**2.** Produce a pictorial diagram given a set of components, their relative position in a control panel, and the associated wire connections to various devices.

**3.** Construct a circuit from a box of devices to match a given pictorial diagram.

### Schematics

1. Discuss the purpose of schematic diagrams.
2. Explain the logical operation of a circuit for which a schematic diagram has been provided.
3. Convert a pictorial diagram into its equivalent schematic diagram.
4. Compare and contrast pictorial diagrams with schematic diagrams.
5. Observe an instructor using a schematic diagram to safely and accurately wire a circuit.
6. Construct a circuit from a schematic diagram and apply power under instructor supervision to check the circuit for proper operation.

### Sequences of Operation

1. Explain the purpose of a sequence of operation.
2. Distinguish between a pictorial diagram, a schematic diagram, and a sequence of operation.
3. Compare and contrast pictorial diagrams, schematic diagrams, and sequences of operation.
4. Observe an instructor construct a unique, operable circuit from a sequence of operation and a variety of components which can satisfy the sequence.
5. Construct a unique, operable circuit from a sequence of operation and a variety of components which can satisfy the sequence.

## Course materials

### Principal text

Shultz, P. T. (2007). *AC/DC Principles*. Homewood, IL: American Technical Publishers. ISBN #: 978-0-8269-1350-0

Shultz, P. T. (2007). *AC/DC Principles Workbook*. Homewood, IL: American Technical Publishers. ISBN #: 978-0-8269-1351-7

Mazur, G. A., & Proctor, T. E. (2010). *Troubleshooting Electrical / Electronic Systems.* Orland Park, IL: American Technical Publishers. ISBN #: 978-0-8269-1791-1

## Lecture materials and handouts

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

DDC Online (Digital control systems principles tutorials):
www.ddc-online.org

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

Presentation tools by Prezi: www.prezi.com

Video Physics lectures on electromagnetism by Walter Lewin, MIT:
http://video.mit.edu/channel/walter-lewin/

All About Circuits materials & videos:
http://www.allaboutcircuits.com/vol_1/index.html

## Other reference materials

None required

## Software needed

None required

## Lab setup and materials

- Workstations with electrical outlets
- DC power supply
- 120/24 volt, 40 VA transformer
- 8-bit adder trainer
- Encoder / Decoder trainer
- Sample schematics / pictorial diagrams / sequences of operation
- Electrical symbols tracing templates (plastic)
- Perforated backplate boards for mounting din rail & devices
- Electromechanical relays (SPDT, DPDT)
- 14, 16, & 18 gauge THHN wire of various colors
- Fork terminals of various sizes
- Blue, orange, & yellow wire nuts
- Wire strippers
- Control screwdrivers / regular size screwdrivers

- Electrical tape
- Assorted resistor types & values
- LED & 24 volt DC indicator lights
- Pushbutton switches
- Thermistors of various types
- Assorted types and sizes of capacitors
- Assorted types and sizes of inductors

## Equipment & instruments required

- 8-bit adder trainer
- Encoder / Decoder trainer
- Multimeter & clamp-on meter
- Voltage proximity sensor
- Scopemeter
- Oscilloscope
- Basic electric motor types

## Samples of weekly assignments

***BUAS 1030 – BAS Assignment # 1 – GPTC East C-Building Electrical Distribution***

**Location**: GPTC C-Building

**Purpose**: Gain an understanding of power distribution within buildings.

**Materials**: Phillips and flat-head screwdrivers, multimeter, safety goggles, electrical gloves, circuit tracer, voltage proximity probe, pad and paper, walkie-talkies, hardhat

**Description**: Students will work in teams of four to create a drawing of the C-Building electrical distribution from the electrical room to five electrical panels on the east side of the building, and finally to the specific circuits located within the Refrigeration / BAS laboratory.

Proper electrical symbols will be used to indicate the location of incoming power conductors, electrical breakers in the electrical room, electrical panel location within the building, the location of bus bars and outlets in the Refrigeration / BAS lab, and all appropriate voltage levels, along with the electrical panel and circuit breaker number they originate from.

Students will work under direct instructor or lab assistant direction, and will not open any live electrical panels, nor will they take any electrical measurements except under instructor supervision.

**Grading**: Rubric can be found in Angel LMS and will include completeness of drawing, accuracy of measurements, correct electrical symbol usage, and timeliness of submission.

***BUAS 1030 – BAS Assignment # 2 – GPTC BAS Laboratory 8-Bit Adder Investigation***

**Location**: Refrigeration / BAS Laboratory in C-Building

**Purpose**: Practice skills of wire-tracing, electrical symbol usage, pictorial diagramming, schematic creation, and sequence of operation writing.

**Materials**: Control screwdriver / Phillips and flat-head screwdrivers / multimeter / needle-nose pliers / voltage proximity probe / wire-strippers / mini-flashlight / eye protection / work gloves / graphing paper / mechanical pencil / ruler / electrical symbol tracing template

**Description**: Students will work in teams of four to develop pictorial, schematic, and sequence of operation documents for the 8-bit adder in the Refrigeration / BAS laboratory. Students will coordinate a time during the week for access to the adder and will trace the circuits to each of the relays, indicator lights, pushbuttons, latching circuits, rocker switches, and all other components of the adder.

All measurements will be taken with the power off, and no re-wiring of the adder will be required. Any wire ties which are loosened during the exercise will be replaced, and all wiring duct covers will also be replaced for the next group of students. A picture will be taken of the trainer at the beginning and the end of the exercise, and an instructor must be present to check the final condition of the trainer prior to students leaving it. If the trainer is not operable at the end of the exercise and students are unable to return it to the original condition, the group will receive a zero for the assignment. Return everything to the state you found it in!

Upon completion of the investigation, students will create pictorial and schematic diagrams of the unit. All lines should be at right angles, using a ruler, and all symbols must be correct and drawn neatly, preferably with a plastic electrical symbol tracing template. Many are available in the lab for sign-out.

Students will also submit a written sequence of operation for the unit, using a writing style that is consistent with the sample sequences provided. Labor on the project should be divided among the group members. A good strategy is to make one group member the coordinator and each of the other three members responsible for one of the three required documents.

At the completion of the exercise, students will present their documents and findings in a 5-minute group presentation.

**Grading**: 75% of the grading will be by rubric and will assess the quality of the three submitted documents for accuracy, completeness, neatness, correct symbol usage, and on-time submission. Documents should be scanned or a picture should be taken of them so they can be submitted via Angel LMS dropbox.

25% of the grading will be by standard communication rubric assessment. Both rubrics are available in Angel LMS.

## Project

***BUAS 1030 – BAS Electrical Concepts II Course Project (Encoder / Decoder)***

**Location**: Refrigeration / BAS Laboratory in C-Building

**Purpose**: Practice skills of wire-tracing, electrical symbol usage, pictorial diagramming, schematic creation, and sequence of operation writing.

**Materials**: Control screwdriver / Phillips and flat-head screwdrivers / multimeter / needle-nose pliers / voltage proximity probe / wire-strippers / mini-flashlight / eye protection / work gloves / graphing paper / mechanical pencil / ruler / electrical symbol tracing template

**Description**: Students will work individually to develop an accurate schematic drawing and sequence of operation for the encoder/decoder trainer in the Refrigeration / BAS laboratory. Students will coordinate a time during the week for access to the encoder/decoder and will trace the circuits to each of the relays, indicator lights, pushbuttons, latching circuits, rocker switches, and all other components of the trainer.

All measurements will be taken with the power off, and no re-wiring will be required. Any wire ties which are loosened during the exercise will be replaced, and all wiring duct covers will also be replaced for the following student. A picture will be taken of the trainer at the beginning and the end of the exercise, and an instructor must be present to check the final condition of the trainer prior to leaving it. If the trainer is not operable at the end of the exercise and the student is unable to return it to the original condition, the student will receive a zero for the assignment. Return everything to the state you found it in!

Upon completion of the investigation, the student will create an accurate schematic diagram of the unit. All lines should be at right angles, using a ruler, and all symbols must be correct and drawn neatly, preferably with a plastic electrical symbol tracing template. Many are available in the lab for sign-out.

Students will also submit a written sequence of operation for the unit, using a writing style that is consistent with the sample sequence provided.

At the completion of the exercise, students will present their schematic and sequence of operation to the entire class in a 5-minute presentation using Prezi.

**Grading**: 75% of the grading will be by rubric and will assess the quality of the schematic diagram and sequence of operation for accuracy, completeness, neatness, correct symbol usage, and on-time submission. Documents should be scanned or a picture should be taken of them so they can be submitted via Angel LMS dropbox. This is NOT a group assignment and therefore, any submissions which are duplicated among students will receive a grade of zero. Each document should be unique to each student.

25% of the grading will be by standard communication rubric assessment. Both rubrics are available in Angel LMS.

# 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 presentations (1 at term end, using Prezi) – Presenting their project findings
- Course project (1 assigned at mid-term) – Turned in prior to student presentations at the end of the term

## Sample test questions

From final exam:

**1.** Select all the reactive components from the following list. You may select more than one.

- ☐ Relay coil
- ☐ Power resistor
- ☐ Start capacitor
- ☐ Run capacitor

**2.** The primary purpose of a circuit breaker is to protect what?

- ☐ Installed wiring

- ☐ The device connected to an outlet
- ☐ The electrical panel
- ☐ The electrical service connected to the building

**3.** The one word which best describes a schematic diagram is _____.

- ☐ Picture
- ☐ Wiring
- ☐ Logic
- ☐ Story

**4.** Which of the following is an example of an electrically-held latching circuit?

- ☐ 2-wire control
- ☐ Wall switch for lighting
- ☐ 3-wire control
- ☐ Centrifugal switch

**5.** Which type of motor has the lowest starting torque?

- ☐ Three-phase
- ☐ CSR
- ☐ PSC
- ☐ Shaded-pole

**6.** Which type of motor reverses rotation when two of its power conductor motor terminations are swapped?

- ☐ PSC
- ☐ CSR
- ☐ Three-phase
- ☐ ECM

## Adaptability to on-line format

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

# Appendix A – Sample syllabus

## Georgia Piedmont Technical College
## BLDG. AUTOMATION SYSTEMS ELECTRICAL CONCEPTS II
## COURSE BUAS 1030 CRN 48938
## SEMESTER Fall, 2011
## OUTLINE, SYLLABUS, & ORIENTATION INFORMATION

### FACULTY INFO

Mr. Brian Lovell / Mr. Leroy Daniels
Clarkston C-13 Email: lovellb@dekalbtech.edu /
danielsl@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 5:30 pm - 6:45 pm

### CREDIT HOURS & PREREQUISITES

3 / BUAS 1020

### INTRODUCTION & COURSE DESCRIPTION

This course continues the development of electrical fundamentals began in BAS Electrical Concepts I. Topics covered include power supplies, reactive electrical components, power distribution, circuit protection, electric motor theory, electric generator theory, types of electric motors, motor starters, switching devices, electrical symbols, pictorial diagrams, schematics, sequences of operation, and basic electrical troubleshooting.

### COURSE COMPETENCIES

See above

### STUDENT LEARNING OUTCOMES

See above

### TEXTBOOK TITLE (required)

"AC/DC Principles" / Pub: ATP / Author: Paul T. Shultz / ISBN #:978-0-8269-1350-0
"AC/DC Principles Workbook" / Pub: ATP / Author: ATP Staff / ISBN #:978-0-8269-1351-7
"Troubleshooting Electrical / Electronic Systems" / Pub: ATP / Authors: Mazur & Proctor / ISBN #:978-0-8269-1791-1

## 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
8/31 - Lecture: Introduction | Homework: Read Ch. 9 in "AC/DC Principles" | Ch. 9 workbook exercises (Due 9/14)

9/5 - Lab 1 (Pre-lab on Angel LMS)

9/7 - Lecture: Ch. 9 "AC/DC" | Homework: Read Ch. 10 "AC/DC" | Ch. 10 workbook exercises (Due 9/14)
Quiz 1 - Due Sunday, 9/18 NLT 11:55pm (Chapter 9)

9/12 - Lab 2 (Pre-lab on Angel LMS)

9/14 - Lecture: Ch. 10 "AC/DC" | Homework: Read Ch. 11 "AC/DC" | Ch. 11 workbook exercises (Due 9/21)
Quiz 2 - Due Sunday, 9/18 NLT 11:55pm (Chapter 10)

9/19 - Lab 3 (Pre-lab on Angel LMS)

9/21 - Lecture: Ch. 11 "AC/DC" | Homework: Read Ch. 12 "AC/DC" | Ch. 12 workbook exercises (Due 9/28)
Quiz 3 - Due Sunday, 9/25 NLT 11:55pm (Chapter 11)

9/26 - Lab 4 (Pre-lab on Angel LMS)

9/28 - Lecture: Ch. 12 "AC/DC" | Homework: Read Ch. 19 "AC/DC" | Ch. 19 workbook exercises (Due 10/5)
Quiz 4 - Due Sunday, 10/2 NLT 11:55pm (Chapter 12)

10/3 - Lab 5 (Pre-lab on Angel LMS)

10/5 - Lecture: Ch. 19 "AC/DC" | Homework: Read Ch. 20 "AC/DC" | Ch. 20 workbook exercises (Due 10/12)
Quiz 5 - Due Sunday, 10/9 NLT 11:55pm (Chapter 19)

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

10/12 - Lecture: Ch. 20 "AC/DC" | Homework: Read Ch. 21 "AC/DC" | Ch. 21 workbook exercises (Due 10/19)
Quiz 6 - Due Sunday, 10/16 NLT 11:55pm (Chapter 20)

10/17 - Lab 7 (Pre-lab on Angel LMS)

10/19 - Lecture: Ch. 21 "AC/DC" | Homework: Read Ch. 8 "Troubleshooting…" | Ch. 8 activities (Due 10/26)
Mid-term Assessment - Due Sunday, 10/23 NLT 11:55pm (Chapters 9 - 12, 19 - 21)

10/24 - Lab 8 (Pre-lab on Angel LMS)

10/26 - Lecture: Ch. 8 "Troubleshooting…" | Homework: Read Ch. 9 "Troubleshooting…" | Ch. 9 activities (Due 11/2)
Quiz 7 - Due Sunday, 10/30 NLT 11:55pm (Chapter 8 "Troubleshooting…")

10/31 - Lab 9 (Pre-lab on Angel LMS)

11/2 - Lecture: Ch. 9 "Troubleshooting…" | Homework: Read Ch. 10 "Troubleshooting" | Ch. 10 activities(Due 11/9)
Quiz 8 - Due Sunday, 11/6 NLT 11:55pm (Chapter 9 "Troubleshooting…")

11/7 - Lab 10 (Pre-lab on Angel LMS)

11/9 - Lecture: Ch. 10 "Troubleshooting…" | Homework: Read Ch. 11 "Troubleshooting" | Ch. 11 activities(Due 11/16)
Quiz 9 - Due Sunday, 11/13 NLT 11:55pm (Chapter 10 "Troubleshooting…")

11/14 - Lab 11 (Pre-lab on Angel LMS)

11/16 - Lecture: Ch. 11 "Troubleshooting…" | Homework: Read Ch. 12 "Troubleshooting" | Ch. 12 activities(Due 11/23)
Quiz 10 - Due Sunday, 11/20 NLT 11:55pm (Chapter 11 "Troubleshooting…")

11/21 - Lab 12 (Pre-lab on Angel LMS)

11/23 - Lecture: Ch. 12 "Troubleshooting…" | Homework: Read Ch. 13 "Troubleshooting" | Ch. 13 activities(Due 11/30)
Quiz 11 - Due Sunday, 11/27 NLT 11:55pm (Chapter 12 "Troubleshooting…")

11/28 - Lab 13 (Pre-lab on Angel LMS)

11/30 - Lecture: Ch. 13 "Troubleshooting…" | Homework: Read Ch. 14 "Troubleshooting" | Ch. 14 activities(Due 12/7)
Quiz 12 - Due Sunday, 12/4 NLT 11:55pm (Chapter 13 "Troubleshooting…")

12/5 - Lab 14 (Pre-lab on Angel LMS)

12/7 - Lecture: Ch. 14 "Troubleshooting…" / Review for Final

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