BUAS 1020 COURSE

GEORGIA PIEDMONT TECHNICAL COLLEGE
INDUSTRIAL & TRANSPORTATION TECHNOLOGIES

Building Automation Systems Program

BUAS 1020 Building Automation Systems Electrical Concepts I

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
495 N. Indian Creek Dr.
Clarkston, GA 30021
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Catalog description

Building Automation Systems (BAS) Electrical Concepts I provides introductory concepts of basic electricity to include metric units, scientific notation, atomic theory, charge, voltage, current, resistance, electromagnetism, conductors, insulators, electrical circuits, measurement devices, Ohm's Law, series circuits, parallel circuits, series-parallel circuits, electrical energy and electrical power.

Class hours

Lecture Hours: 27

Laboratory Hours: 46

Units

Semester Credit Hours: 3

Entry skills needed

- Taken concurrently with BUAS 1010
- Basic electrical skills (this course is usually taken in conjunction with introductory electrical course)
- 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:

Metric Units

Understand metric units and be able to convert between English and metric systems.

Scientific Notation

Explain the purpose of scientific notation and use it as a mathematical expression for larger numbers.

Atomic Theory

Understand the modern physical theory of matter, its composition, and components.

Charge

Explain the Law of Charges and how it relates to positively and negatively charged particles.

Voltage

Understand the concept of voltage, its unit of measurement, and how it relates to electrical energy.

Current

Understand the concept of current, its unit of measurement, and how it relates to electrical energy.

Resistance

Understand the concept of resistance, its unit of measurement, and how it relates to electrical energy.

Conductors / Insulators

Understand the use of conductors, insulators, and semi-conductors and give examples of each.

Basic Electrical Circuits

Identify the components of a complete electrical circuit and be able to construct an example.

Electrical Safety

Understand safe vs. unsafe electrical practices and the proper use of related safety equipment.

Electrical Measurement Devices

Explain and demonstrate the proper use of various devices and meters.

Ohm's Law

Explain and apply Ohm's Law to solve problems related to voltage, current, and resistance in a circuit.

Series Circuits

Explain, draw, and be able to construct a series circuit.

Parallel Circuits

Explain, draw, and be able to construct a parallel circuit.

Series – Parallel Circuits

Explain, draw, and be able to construct a series-parallel circuit.

Electrical Energy

Understand how energy relates to matter and give examples of electrical energy sources and components which use electricity.

Electrical Power

Explain the concepts and units of energy, work, and power and how they differ.

Exit skills

Course content to achieve outcomes listed above:

Metric Units

1. Give examples of metric units.
2. Convert between the English & metric system for length, mass, and energy.

Scientific Notation

1. Convert large numbers into scientific notation.
2. State the number of significant digits in given numbers.
3. Convert between decimal and scientific notation.
4. Add, multiply, and divide numbers in scientific notation.

Atomic Theory

1. Draw the structure of a typical atom showing electrons, protons, and neutrons.
2. Define the term electron shell.

3. Describe the Periodic Table of Elements and identify the location of those which offer favorable electrical properties for use in conductors.

Charge

1. Explain the Law of Charges.
2. Describe how and why positive and negative charges accumulate and interact.
3. Calculate the force of attraction between negatively and positively charged substances given the amount of charge and distance separating them.
4. Construct a small Tesla coil in the laboratory under instructor supervision.

Voltage

1. Define the term voltage.
2. Discuss what is meant by potential energy and how that relates to voltage.
3. Give examples of where we might encounter voltage sources.
4. Explain the ways in which voltage may be generated.
5. Articulate the function of voltage in a circuit by using the analogy of water flowing through a pipe.

Current

1. Define the term current.
2. Describe which component of an atom is physically moving through a wire when current is flowing.
3. Discuss the units used to express current.
4. Establish an analogy between current flow and water flowing through a pipe.
5. Compare and contrast the concepts of voltage and current.

Resistance

1. Define the term resistance.
2. Examine the history of the term ohm and how it came to be applied to resistance.
3. Explain what effect resistance has in an electrical circuit.

4. Rank common substances from high to low resistance.

5. Compare and contrast the concepts of resistance, current, and voltage.

Conductors / Insulators

1. Define conductors, insulators, and semi-conductors.

2. Give examples of good insulators.

3. Give examples of good conductors.

4. Give examples of semi-conductor materials and how they are used.

5. Categorize materials as conductors, insulators, or semi-conductors.

6. Consider the impact semi-conductor materials have had on our society over the past 50 years.

7. Rank a list of unknown substances from best conductor to best insulator, also sub-dividing each substance into categories of conductor, semi-conductor, and insulator.

Basic Electrical Circuits

1. Identify the three required things for a complete electrical circuit.

2. Predict how an electrical circuit's current would respond if the resistance in the circuit is increased and then decreased.

3. Explain what is meant by the term "short circuit."

4. Explain what is meant by the term "open circuit."

5. Explain the term "continuity."

6. Construct a basic electric circuit with a power source, a complete path for current flow, a load, and a switch.

Electrical Safety

1. Give examples of unsafe electrical practices.

2. Observe an instructor opening an electrical panel and taking voltage and current measurements while using proper electrical safety procedures.

3. State the procedures and safety gear needed when taking high voltage measurements.

4. Demonstrate the proper employment of electrical safety procedures while taking voltage and current measurements in an electric panel.

5. Cite all the electrical safety equipment and measurement devices any field technician should have.

6. Diagram how the human body might act as a conductor from an electrical circuit to ground and the dangers this presents.

Electrical Measurement Devices

1. Describe what a multimeter is and what information it can provide.

2. Explain how an analog meter functions.

3. Describe the D'Arsonval movement.

4. Discuss how digital multimeters work and their accuracy versus analog meters.

5. Explain how clamp-on meters measure current flow in a circuit.

6. Compare and contrast analog and digital meters on the basis of accuracy, calibration, and procedures for taking electrical measurements.

7. Observe voltage, current, and resistance measurements taken by an instructor.

8. Demonstrate taking proper electrical measurements of voltage, current, and resistance.

Ohm's Law

1. Define Ohm's Law.

2. Summarize how and when Ohm's Law can be used and when it's not accurate.

3. Solve problems using Ohm's Law.

4. Construct a basic electrical circuit with one power source and one load and use Ohm's Law to predict the current flow through the circuit.

5. Construct a basic DC electrical circuit using a variable resistor, and through the use of Ohm's Law, calculate the resistance value after voltage and current are measured, and then verify by checking the resistance value with the power off.

6. Graph how a thermistor's resistance changes with increasing temperature by checking the resistance at 5 degree intervals from 32 degrees F to 120 degrees F.

Series Circuits

1. Describe what is meant by the term "series circuit."
2. Explain how voltage drops and current flows through series circuit components.
3. Draw a series circuit clearly showing and labeling all components.
4. Observe an instructor properly wiring electrical components in a series circuit.
5. Construct a simple series circuit from provided electrical components.

Parallel Circuits

1. Define the term "parallel circuit."
2. Discuss how voltage and current flow through the components of a parallel circuit.
3. Draw a parallel circuit clearly labeling all components.
4. Compare and contrast the way voltage and current flow through the electrical components in series and parallel circuits.
5. Observe an instructor properly wiring a parallel circuit.
6. Construct a parallel circuit from electrical components provided.

Series-Parallel Circuits

1. Describe what is meant by the term "series-parallel circuit."
2. Discuss how voltage drops and current flows through components in a series-parallel circuit.
3. Break down a complex series-parallel circuit into a simple, equivalent circuit.
4. Observe an instructor properly wiring a series-parallel circuit.
5. Construct a series-parallel circuit from electrical components provided.

Electrical Energy

1. Discuss the concept of energy and how it relates to matter.
2. Give examples of common forms of energy in nature.
3. Cite the primary sources of electrical energy.

4. Cite the SI unit of energy and how to convert it to other forms of energy.

5. Cite common electrical components which consume electrical power.

Electrical Power

1. Describe the term "work" as it applies to electrical work.

2. Define the term "electrical power."

3. Discuss the SI unit of power and how it converts into English units.

4. Compare and contrast the concepts of energy, work, and power.

Course materials

Principal texts

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 makes significant use of online learning management system resources as well as supportive websites and videos:

DDC Online (Intro. to digital control systems, Input/Output 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
- 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

Equipment & instruments required

- Multimeter & clamp-on meter
- Scopemeter

Samples of laboratory assignments

BUAS 1020 – BAS Assignment # 1 – Contrasting Series & Parallel Circuits

Provided with resistors, switches, LED indicator lights, a DC power supply, and hookup wire, connect the components into a series circuit under instructor supervision to match a sample circuit.

Create a table to record voltage, current, and resistance readings throughout the circuit and proceed to fill in the table with measurements taken with your multimeter, being certain to take readings according to proper safety procedures.

Repeat the exercise by rearranging the circuit components to match a sample parallel circuit provided by the instructor. Again, create a table and fill in all the circuit values through direct measurements with your multimeter.

After completion of the exercise, remove all components from the circuits and return them to the proper locations in your laboratory workbenches.

Summarize your results taking particular note of differences and similarities in your circuit readings and be prepared to explain them to the class upon completion in a 3-minute summary.

Project

BUAS 1020 – BAS Electrical I Course Project Assignment – RS-485 Network Communications Resistance in the GPTC Starnes Center

Location: Paul M. Starnes facility

Purpose: Gain familiarity with multimeter / Exposure to RS-485 communications cabling / Learn to test for continuity / Calculate resistance per foot of cable and compare with published tables

Materials: Multimeter / wire strippers / electrical tape / blue wire nuts / ladder / walkie-talkies / hard hat / flashlight / safety goggles / 500' of 18/2 twisted, shielded pair

Description: You will be installing an RS-485 communications network in the Starnes Center to parallel an existing network of 13 controllers.

You will work in teams of 3 to run communications cabling between each of 13 application-specific controllers. The communications cable at each controller location will not be terminated to the controller, but instead will be cut and spooled going to and coming from each controller in such a fashion that there will be 12 separate cabling segments between all 13 of the controllers. One final segment of the network, which is called the home-run segment, will be run from the first controller back to the main building controller panel located in the electrical room.

Once all the cabling is installed, each segment of the network will be shorted on one end and tested for continuity starting with the segment from the building controller to the first controller. Resistance measurements will then be recorded, and once complete, the short will be disconnected and connected to the next segment of network cabling. At the next controller location, another resistance measurement is recorded, now reading through two connected segments. This will be repeated until all 13 segments are connected in one communications loop, again recording the resistance through the entire span of the network.

Once the measurements are complete, the segments of cabling will be removed, the length of each segment measured and recorded, and all the results organized into presentation form for turn-in and classroom presentations at the end of the semester.

The team presentations should be 15 minutes in length and should touch on the following things at minimum:

- Introduction of the team and the roles each participant filled
- Presentation of the results and comparison against published tables of resistance for 18 awg stranded copper conductors
- The three most important things you learned from the exercise and why
- Unexpected challenges you encountered along the way

Assessment

Methods

- Discussion board participation (each week in Angel learning management system)
- Homework – Pre-lab completion prior to class
- Classroom participation & attendance
- Quizzes (6) – Delivered through Angel learning management system & due by Sunday night of each respective week
- Course exams (2 incl. 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. When taking resistance measurements on a circuit component, what should you do to be certain you're only reading the resistance of that one component?

a. Apply power to the circuit

b. Remove all conductors from one side of the component to prevent reading resistance back through the circuit

c. Use a voltage proximity sensor to test for voltage on both sides of the component before taking a measurement

2. Which of the following sizes of THHN stranded conductors can carry the most current?
   a. 18 awg
   b. 14 awg
   c. 10 awg

3. Two resistors of equal value, X ohms, connected in parallel can be simplified to one resistor of value ____
   a. 2X
   b. ½ X
   c. X + X
   d. ¼ X

4. In a series circuit, current through all components is _____, while voltage across circuit components is _____.
   a. variable; constant
   b. variable; variable
   c. constant; variable
   d. constant; constant

5. As the sensed temperature of a thermistor increases, its resistance _____.
   a. increases
   b. decreases
   c. remains constant

6. Ohm's Law is used effectively
   a. in all circuits
   b. in all DC circuits and all purely resistive AC circuits
   c. in all AC circuits and all purely resistive DC circuits
   d. in only AC circuits

7. In resistive circuit components, electrical power
   a. is stored in plates
   b. is stored in fields
   c. is largely consumed and converted into heat

8. When conducting voltage tests in a control panel, technicians connect one lead of the meter to ground and use only one hand to move the other lead around the circuits in a method of testing known as the _____ method.
   a. jumping
   b. safe testing

c. hopscotch

Adaptability to on-line format

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

Appendix A – Sample syllabus

Georgia Piedmont Technical College
BLDG. AUTOMATION SYSTEMS ELECTRICAL CONCEPTS I
COURSE BUAS 1020 CRN 48937
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

Tuesdays / Thursdays 5:30 pm - 6:45 pm

CREDIT HOURS & PREREQUISITES

3 / None

INTRODUCTION & COURSE DESCRIPTION

Introductory concepts of basic electricity to include metric units, scientific notation, atomic theory, charge, voltage, current, resistance, electromagnetism, conductors, insulators, electrical circuits, measurement devices, Ohm's Law, series circuits, parallel circuits, series-parallel circuits, electrical energy, electrical power.

COURSE COMPETENCIES

See above sections

STUDENT LEARNING OUTCOMES

See above sections

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
8/30 - Lecture: Introduction | Homework: Read Ch. 1 in "AC/DC Principles" | Ch. 1 workbook exercises (Due 9/20)

9/6 - Lecture: Ch. 1 "AC/DC" | Homework: Read Ch. 2 "AC/DC" | Ch. 2 workbook exercises (Due 9/20)
Quiz 1 - Due Sunday, 9/18 NLT 11:55pm (Chapter 1)
9/8 - Lab Exercise 1 (Pre-lab on Angel LMS)

9/13 - Lecture: Ch. 2 "AC/DC" | Homework: Read Ch. 3 "AC/DC" | Ch. 3 workbook exercises (Due 9/20)
Quiz 2 - Due Sunday, 9/18 NLT 11:55pm (Chapter 2)
9/15 - Lab Exercise 2 (Pre-lab on Angel LMS)

9/20 - Lecture: Ch. 3 "AC/DC" | Homework: Read Ch. 4 "AC/DC" | Ch. 4 workbook exercises (Due 9/27)
Quiz 3 - Due Sunday, 9/25 NLT 11:55pm (Chapter 3)
9/22 - Lab Exercise 3 (Pre-lab on Angel LMS)

9/27 - Lecture: Ch. 4 "AC/DC" | Homework: Read Ch. 5 "AC/DC" | Ch. 5 workbook exercises (Due 10/4)
Quiz 4 - Due Sunday 10/2 NLT 11:55pm (Chapter 4)
9/29 - Lab Exercise 4 (Pre-lab on Angel LMS)

10/4 - Lecture: Ch. 5 "AC/DC" | Homework: Read Ch. 6 "AC/DC" | Ch. 6 workbook exercises (Due 10/11)
Quiz 5 - Due Sunday, 10/9 NLT 11:55pm (Chapter 5)
10/6 - Lab Exercise 5 (Pre-lab on Angel LMS)

10/11 - Lecture: Ch. 6 "AC/DC" | Homework: Read Ch. 7 "AC/DC" | Ch. 7 workbook exercises (Due 10/18)
Quiz 6 - Due Sunday, 10/16 NLT 11:55pm (Chapter 6)
10/13 - Lab Exercise 6 (Pre-lab on Angel LMS)

10/18 - Lecture: Ch. 7 "AC/DC" | Homework: Read Ch. 8 "AC/DC" | Ch. 8 workbook exercises (Due 10/25)
Mid-term Assessment - Due Sunday, 10/23 NLT 11:55pm (Chapters 1 through 7)
10/20 - Lab Exercise 7 (Pre-lab on Angel LMS)

10/25 - Lecture: Ch. 8 "AC/DC" | Homework: Read Ch. 1 "Troubleshooting…" | Ch. 1 activities (Due 11/1)
Quiz 7 - Due Sunday, 10/30 NLT 11:55pm (Chapter 8)
10/27 - Lab Exercise 8 (Pre-lab on Angel LMS)

11/1 - Lecture: Ch. 1 "Troubleshooting…" | Homework: Read Ch. 2 "Troubleshooting…" | Ch. 2 activities (Due 11/8)
Quiz 8 - Due Sunday, 11/6 NLT 11:55pm (Chapter 1 - "Troubleshooting…")
11/3 - Lab Exercise 9 (Pre-lab on Angel LMS)

11/8 - Lecture: Ch. 2 "Troubleshooting…" | Homework: Read Ch. 3 "Troubleshooting…" | Ch. 3 activities (Due 11/15)
Quiz 9 - Due Sunday, 11/13 NLT 11:55pm (Chapter 2 - "Troubleshooting…")
11/10 - Lab Exercise 10 (Pre-lab on Angel LMS)

11/15 - Lecture: Ch. 3 "Troubleshooting…" | Homework: Read Ch. 4 "Troubleshooting…" | Ch. 4 activities (Due 11/22)
Quiz 10 - Due Sunday, 11/20 NLT 11:55pm (Chapter 3 - "Troubleshooting…")
11/17 - Lab Exercise 11 (Pre-lab on Angel LMS)

11/22 - Lecture: Ch. 4 "Troubleshooting…" | Homework: Read Ch. 5 "Troubleshooting…" | Ch. 5 activities (Due 11/29)
Quiz 11 - Due Sunday, 11/27 NLT 11:55pm (Chapter 4 - "Troubleshooting…")
11/24 - Lab Exercise 12 (Pre-lab on Angel LMS)

11/29 - Lecture: Ch. 5 "Troubleshooting…" | Homework: Read Ch. 6 "Troubleshooting…" | Ch. 6 activities (Due 12/6)
Quiz 12 - Due Sunday, 12/4 NLT 11:55pm (Chapter 5 - "Troubleshooting…")
12/1 - Lab Exercise 13 (Pre-lab on Angel LMS)

12/6 - Lecture: Ch. 6 "Troubleshooting…" | Homework: Read Ch. 7 "Troubleshooting…" | Ch. 7 activities (Due 12/13)
Quiz 13 - Due Sunday, 12/11 NLT 11:55pm (Chapter 6 - "Troubleshooting…")
12/8 - Lab Exercise 14 (Pre-lab on Angel LMS)

12/13 - Lecture: Ch. 7 "Troubleshooting…" / Review for final

12/15 - Final Assessment - Due Thursday, 12/15 NLT 12:00pm (noon) - No Exceptions or Extensions

Course Project Due Thursday, 12/15 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 For m.

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