



**AIRC-1040 HVACR Electrical Motors**  
**COURSE SYLLABUS**  
**Fall Semester 2021 - 202212**

**COURSE INFORMATION**

Credit Hours/Minutes: 4/4500  
Campus/Class Location: Vidalia / Main Building Room 423  
Class Meets M/T/W/R 10:40-11:55 a.m.  
Course Reference Number (CRN): 20004

**INSTRUCTOR CONTACT INFORMATION**

Instructor Name: Vince Scott  
Office Location: Main Building Room 426  
Office Hours: Call to Schedule  
Email Address: [Vince Scott vscott@southeasterntech.edu](mailto:Vince.Scott@southeasterntech.edu)  
Phone: 912-538-3146  
Fax Number: 912-538-3156  
Tutoring Hours (if applicable): By appointment

**SOUTHEASTERN TECHNICAL COLLEGE'S (STC) CATALOG AND HANDBOOK**

Students are responsible for all policies and procedures and all other information included in Southeastern Technical College's [Catalog and Handbook](https://catalog.southeasterntech.edu/college-catalog/downloads/current.pdf) (<https://catalog.southeasterntech.edu/college-catalog/downloads/current.pdf>).

**REQUIRED TEXT**

Fundamentals of HVACR 3rd Edition by Carter Stanfield & David Skaves, published by Pearson ISBN: 0-13-401616-5

**REQUIRED SUPPLIES & SOFTWARE**

Safety glasses notebook for taking notes, 3 ring binder for hand-outs, and pen or pencil to use in class every day. **NOTE: You must have textbook and notebook with pen or pencil with you each day for class.**

**Students should not share login credentials with others and should change passwords periodically to maintain security.**

**SAFETY**

Shop safety is of paramount importance. Unsafe practices of any kind will result in dismissal from class. Proper clothing must be worn at all times, NO open toe shoes, No baggy clothes. Baggy pants are unsafe to work in and showing your underwear is viewed as indecent exposure.

**COURSE DESCRIPTION/COMPENTENCIES**

This course provides the student with the skills and knowledge necessary for application and service of electric motors commonly used by the refrigeration and air conditioning industry. Topics include diagnostic techniques, capacitors, installation procedures, types of electric motors, electric motor service, and safety.

## **COURSE COMPETENCIES (PER KMS STATE STANDARD)**

1. Safety
2. Motor Identification
3. Motor Application
4. Motor Protection and Starting Components
5. Diagnostic Techniques

## **PREREQUISITE(S)**

None

## **COURSE OUTLINE**

1. Safety
2. Diagnostic techniques,
3. Capacitors
4. Installation procedures
5. Types of electric motors
6. Overload devices
7. Magnetic starters
8. Electric motor servicing

## **GENERAL EDUCATION CORE COMPETENCIES**

Southeastern Technical College has identified the following general education core competencies that graduates will attain:

1. The ability to utilize standard written English.
2. The ability to solve practical mathematical problems.
3. The ability to read, analyze, and interpret information

## **STUDENT REQUIREMENTS**

Students are expected to complete all tests and comprehensive/Lab problems by the due dates. A ten point penalty will be assessed for each day a comprehensive problem is late. There are no makeup tests. Tests are made available for several days; therefore, there are no makeup tests. Students who miss a test will be assigned a grade of zero. Students are responsible for policies and procedures included in the *STC E-Catalog*.

## **COVID-19 MASK REQUIREMENT**

Regardless of vaccination status, masks or face coverings must be worn at all times while in a classroom or lab of Southeastern Technical College. This measure is being implemented to reduce COVID-19 related health risks for everyone engaged in the educational process. Masks or face coverings must be worn over the nose and mouth, in accordance with the Centers for Disease Control and Prevention (CDC). A student's refusal to wear a mask or face covering will be considered a classroom disruption and the student may be asked to leave campus and/or receive further discipline.

## **COVID-19 SIGNS AND SYMPTOMS**

We encourage individuals to monitor for the signs and symptoms of COVID-19 prior to coming on campus.

If you have experienced the symptoms listed below or have a body temperature 100.4°F or higher, we encourage you to self-quarantine at home and contact a primary care physician's office, local urgent care facility, or health department for further direction. Please notify your instructor(s) by email and do not come on campus for any reason.

<b>COVID-19 Key Symptoms</b>
Fever or felt feverish
Chills
Shortness of breath or difficulty breathing (not attributed to any other health condition)
Cough: new or worsening, not attributed to another health condition
Fatigue
Muscle or body aches
Headache
New loss of taste or smell
Sore throat (not attributed to any other health condition)
Congestion or runny nose (not attributed to any other health condition)
Nausea or vomiting
Diarrhea
<b>In the past 14 days, if you:</b>
Have had close contact with or are caring for an individual diagnosed with COVID-19 at home (not in healthcare setting), please do not come on campus and contact your instructor (s).

### **COVID-19 SELF-REPORTING REQUIREMENT**

Students, regardless of vaccination status, who test positive for COVID-19 or who have been exposed to a COVID-19 positive person, are required to self-report using <https://www.southeasterntech.edu/covid-19/>. Report all positive cases of COVID-19 to your instructor and [Stephannie Waters](#), Exposure Control Coordinator, [swaters@southeasterntech.edu](mailto:swaters@southeasterntech.edu), 912-538-3195.

### **ATTENDANCE GUIDELINES**

Class attendance is a very important aspect of a student's success. Being absent from class prevents students from receiving the full benefit of a course and also interrupts the learning process. Southeastern Technical College considers both tardiness and leaving early as types of absenteeism. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is required for student success. Students will be expected to complete all work required by the instructor as described in the individual course syllabus.

Instructors have the right to give unannounced quizzes/assignments. Students who miss an unannounced quiz or assignment will receive a grade of 0. Students who stop attending class, but do not formally withdraw, may receive a grade of F and face financial aid repercussions in upcoming semesters.

Instructors are responsible for determining whether missed work may be made up and the content and dates for makeup work is at the discretion of the instructor.

Students will not be withdrawn by an instructor for attendance; however, all instructors will keep records of graded assignments and student participation in course activities. The completion dates of these activities will be used to determine a student's last date of attendance in the event a student withdraws, stops attending, or receives an F in a course.

### **STUDENTS WITH DISABILITIES**

Students with disabilities who believe that they may need accommodations in this class based on the impact

of a disability are encouraged to contact the appropriate campus coordinator to request services.

**Swainsboro Campus:** [Daphne Scott dscott@southeasterntech.edu](mailto:dscott@southeasterntech.edu), 478-289-2274, Building 1, Room 1210

**Vidalia Campus:** [Helen Thomas hthomas@southeasterntech.edu](mailto:hthomas@southeasterntech.edu), 912-538-3126, Building A, Room 165

## **SPECIFIC ABSENCES**

Provisions for Instructional Time missed because of documented absences due to jury duty, military duty, court duty, or required job training will be made at the discretion of the instructor.

## **PREGNANCY**

Southeastern Technical College does not discriminate on the basis of pregnancy. However, we can offer accommodations to students who are pregnant that need special consideration to successfully complete the course. If you think you will need accommodations due to pregnancy, please make arrangements with the appropriate campus coordinator.

**Swainsboro Campus:** [Daphne Scott dscott@southeasterntech.edu](mailto:dscott@southeasterntech.edu), 478-289-2274, Building 1, Room 1210

**Vidalia Campus:** [Helen Thomas hthomas@southeasterntech.edu](mailto:hthomas@southeasterntech.edu), 912-538-3126, Building A, Room 165

It is strongly encouraged that requests for consideration be made **PRIOR** to delivery and early enough in the pregnancy to ensure that all the required documentation is secured before the absence occurs. Requests made after delivery **MAY NOT** be accommodated. The coordinator will contact your instructor to discuss accommodations when all required documentation has been received. The instructor will then discuss a plan with you to make up missed assignments.

## **WITHDRAWAL PROCEDURE**

Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% point of the term in which student is enrolled (date will be posted on the school calendar) must speak with a Career Counselor in Student Affairs and complete a Student Withdrawal Form. A grade of "W" (Withdrawn) is assigned for the course(s) when the student completes the withdrawal form.

Important – Student-initiated withdrawals are not allowed after the 65% point. After the 65% point of the term in which the student is enrolled, the student has earned the right to a letter grade and will receive a grade for the course. Please note: Abandoning a course(s) instead of following official withdrawal procedures may result in a grade of "F" (Failing 0-59) being assigned.

Informing your instructor that you will not return to his/her course, does not satisfy the approved withdrawal procedure outlined above.

There is no refund for partial reduction of hours. Withdrawals may affect students' eligibility for financial aid for the current semester and in the future, so a student must also speak with a representative of the Financial Aid Office to determine any financial penalties that may be assessed due to the withdrawal. A grade of "W" will count in attempted hour calculations for the purpose of Financial Aid.

**REMEMBER** - Informing your instructor that you will not return to his/her course does not satisfy the approved withdrawal procedure outlined above.

## **MAKEUP GUIDELINES (TESTS, QUIZZES, HOMEWORK, PROJECTS, ETC.)**

**(Tests, quizzes, homework, projects, etc...):** If a student misses a test, a grade of zero will be assigned. **Only students with extenuating circumstances (who contact the instructor on the day of the test regarding their absence) will be allowed to take a makeup test, which will replace the zero.** Extenuating circumstances are

determined at the instructor's discretion. Unless otherwise scheduled with the instructor, it is expected that the test will be taken the next day, scheduled outside of regular class time. Failure to follow this procedure will result in a grade of zero.

## **ACADEMIC DISHONESTY POLICY**

The Southeastern Technical College Academic Dishonesty Policy states that all forms of academic dishonesty, including but not limited to cheating on tests, plagiarism, collusion, and falsification of information, will call for discipline. The policy can also be found in the Southeastern Technical College Catalog and Handbook.

## **PROCEDURE FOR ACADEMIC MISCONDUCT**

The procedure for dealing with academic misconduct and dishonesty is as follows:

### **1. First Offense**

Student will be assigned a grade of "0" for the test or assignment. Instructor keeps a record in course/program files and notes as first offense. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus. The Registrar will input the incident into Banner for tracking purposes.

### **2. Second Offense**

Student is given a grade of "WF" (Withdrawn Failing) for the course in which offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Registrar will input the incident into Banner for tracking purposes.

### **3. Third Offense**

Student is given a grade of "WF" for the course in which the offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of third offense. The Vice President for Student Affairs, or designee, will notify the student of suspension from college for a specified period of time. The Registrar will input the incident into Banner for tracking purposes.

## **STATEMENT OF NON-DISCRIMINATION**

The Technical College System of Georgia (TCSG) and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, political affiliation or belief, genetic information, disabled veteran, veteran of the Vietnam Era, spouse of military member, or citizenship status (except in those special circumstances permitted or mandated by law). This nondiscrimination policy encompasses the operation of all technical college-administered programs, federally financed programs, educational programs and activities involving admissions, scholarships and loans, student life, and athletics. It also applies to the recruitment and employment of personnel and contracting for goods and services.

All work and campus environments shall be free from unlawful forms of discrimination, harassment and retaliation as outlined under Title IX of the Educational Amendments of 1972, Title VI and Title VII of the Civil Rights Act of 1964, as amended, the Age Discrimination in Employment Act of 1967, as amended, Executive Order 11246, as amended, the Vietnam Era Veterans Readjustment Act of 1974, as amended, Section 504 of the Rehabilitation Act of 1973, as amended, the Americans With Disabilities Act of 1990, as amended, the Equal Pay Act, Lilly Ledbetter Fair Pay Act of 2009, the Georgia Fair Employment Act of 1978, as amended, the Immigration Reform and Control Act of 1986, the Genetic Information Nondiscrimination Act of 2008, the Workforce Investment Act of 1998 and other related mandates under TCSG Policy, federal or state statutes.

The Technical College System and Technical Colleges shall promote the realization of equal opportunity through a positive continuing program of specific practices designed to ensure the full realization of equal

opportunity.

The following individuals have been designated to handle inquiries regarding the nondiscrimination policies:

<b>American With Disabilities Act (ADA)/Section 504 - Equity- Title IX (Students) – Office of Civil Rights (OCR) Compliance Officer</b>	<b>Title VI - Title IX (Employees) – Equal Employment Opportunity Commission (EEOC) Officer</b>
Helen Thomas, Special Needs Specialist Vidalia Campus 3001 East 1 <sup>st</sup> Street, Vidalia Office 165 Phone: 912-538-3126 Email: <a href="mailto:hthomas@southeasterntech.edu">Helen Thomas</a> <a href="mailto:hthomas@southeasterntech.edu">hthomas@southeasterntech.edu</a>	Lanie Jonas, Director of Human Resources Vidalia Campus 3001 East 1 <sup>st</sup> Street, Vidalia Office 138B Phone: 912-538-3230 Email: <a href="mailto:ljonas@southeasterntech.edu">Lanie Jonas</a> <a href="mailto:ljonas@southeasterntech.edu">ljonas@southeasterntech.edu</a>

### ACCESSIBILITY STATEMENT

Southeastern Technical College is committed to making course content accessible to individuals to comply with the requirements of Section 508 of the Rehabilitation Act of Americans with Disabilities Act (ADA). If you find a problem that prevents access, please contact the course instructor.

### GRIEVANCE PROCEDURES

Grievance procedures can be found in the Catalog and Handbook located on Southeastern Technical College's website.

### ACCESS TO TECHNOLOGY

Students can now access Blackboard, Remote Lab Access, Student Email, Library Databases (Galileo), and BannerWeb via the mySTC portal or by clicking the Current Students link on the [Southeastern Technical College \(STC\) Website \(www.southeasterntech.edu\)](http://www.southeasterntech.edu).

### TECHNICAL COLLEGE SYSTEM OF GEORGIA (TCSG) GUARANTEE/WARRANTY STATEMENT

*The Technical College System of Georgia guarantees employers that graduates of State Technical Colleges shall possess skills and knowledge as prescribed by State Curriculum Standards. Should any graduate employee within two years of graduation be deemed lacking in said skills, that student shall be retrained in any State Technical College at no charge for instructional costs to either the student or the employer.*

### GRADING POLICY

Assessment/Assignment	Percentage
Test	30%
Lab Test	20%
Lab Assignments	50%

### GRADING SCALE

Letter Grade	Range
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

## AIRC 1040 HVAC Electrical Motors

### Fall Semester 2021 - 202212 lesson plan

Date/Week	Chapter/Lesson	Content	Assignments & Tests Due Dates	Competency Area
Aug 16-19	Chapter 3	<p style="text-align: center;"><b>Safety</b></p> <p style="text-align: center;">Safety hazards</p>	<p>Discuss the safety hazards found in working with electric motors and their components</p> <p>Safety Test</p>	<p style="text-align: center;">1</p> <p style="text-align: center;">a, c</p>
Aug 23-26 30,31	Chapter 37	<p style="text-align: center;"><b>Diagnostic Techniques</b></p> <p style="text-align: center;">Applications for belts, pulleys, and motors</p>	<p>Discuss the four types of belt and pulley drives</p> <p>Inspect the belt guards on lab equipment</p> <p>Remove and/or install belts</p> <p>Adjust belt tension on V-belts or drive belts</p> <p>Discuss safety concerns found in working with motors, pulleys, and drive belts</p>	<p style="text-align: center;">3,4</p> <p style="text-align: center;">a, c</p>
Sept 6-9	Chapter 36	<p style="text-align: center;"><b>Capacitors</b></p> <p style="text-align: center;">Theory</p>	<p>Define a capacitor</p> <p>Define the term microfarad</p>	<p style="text-align: center;">4</p> <p style="text-align: center;">a, c</p>
Sept 13-16		<p style="text-align: center;">Applications</p>	<p>Observe the use of capacitors on lab equipment</p> <p>Properly test various capacitors with volt-ohm millimeter (VOM) and capacitor tester.</p> <p>Demonstrate how to properly discharge a capacitor</p>	<p style="text-align: center;">4</p> <p style="text-align: center;">a,b, c</p>
Sept 20-23	Chapter 37	<p style="text-align: center;"><b>Installation Procedures</b></p> <p style="text-align: center;">Application</p>	<p>Properly install a condenser fan motor</p> <p>Properly install an evaporator fan motor</p>	<p style="text-align: center;">3,4,5</p> <p style="text-align: center;">a, c</p>

<b>Date/Week</b>	<b>Chapter/Lesson</b>	<b>Content</b>	<b>Assignments &amp; Tests Due Dates</b>	<b>Competency Area</b>
Sept 27-29	Chapter 35	<b>Types of Electric Motors</b> Theory	Explain the principles of three-phase motor operation Explain the principles of shaded motor operation Explain the principles of split-phase motor operation Explain the principles of capacitor start motor operation	2,3,4 a, c
Oct 4-7		Theory	Explain the principles of PSC motor operation Explain the principles of CSR motor operation Explain the principles of ECM motor operation Explain the operation of single-phase motor starting components	2,4 a, c
Oct 11-14	Chapter 36	Types and applications	Classify motors used in the HVAC industry Discuss the various motor applications Describe methods of starting and protecting electrical motors	2,4 a, c
Oct 18-21 25-28	Chapter 35	Types and applications	Differentiate between motor windings in both single and three-phase motors Properly connect a single-phase motor to include all starting components	2 a, c



<b>Date/Week</b>	<b>Chapter/Lesson</b>	<b>Content</b>	<b>Assignments &amp; Tests Due Dates</b>	<b>Competency Area</b>
Nov 1-4	Chapter 36	<b>Overload Devices</b> Theory and application	Discuss the difference between a thermal overload and a magnetic overload Replace a thermal overload on an air conditioning compressor Check for continuity in thermal overloads	3,4,5 a, c
Nov 8-11	Chapter 36	<b>Magnetic Starters</b> Theory and application	Discuss the differences between a magnetic starter and contractor Replace a magnetic starter on a compressor Test a magnetic starter with a VOM	3, 4, 5 a, c
Nov 15-18	Chapter 37	Service and troubleshooting	Discuss the installation of bearings on shafts Remove or install fans or blowers Reverse motor current rotation Measure motor current draw	1, 3, 4, 5 a, b, c
Nov 22-25	Chapter 37	Service and troubleshooting  Review for Finals	Lab work  Review for Finals Homework Due	5 a, c
Nov 29 Thru Dec 1-2	FINALS	Final Exam for AIRC 1040 Chapters 35,36,37		1-5 a, b, c

#### **COURSE COMPETENCIES (PER KMS STATE STANDARD)**

1. Safety
2. Motor Identification
3. Motor Application
4. Motor Protection and Starting Components
5. Diagnostic Techniques

**GENERAL CORE EDUCATIONAL COMPETENCIES:**

- a) The ability to utilize standard written English.
- b) The ability to solve practical mathematical problems.
- c) The ability to read, analyze, and interpret information.