



**AMCA2130 - CNC MILL MANUAL PROGRAMMING**  
**COURSE SYLLABUS**  
**Fall Semester 2017**

**COURSE INFORMATION**

Credit Hours/Minutes: 5/5250  
Class Location: Lab 6112/Class Room 6110  
Class Meets: 4:30 – 7:30 PM, TR  
CRN: 20377

**INSTRUCTOR CONTACT INFORMATION**

Instructor Name: David G. Mills  
Office Location: Room 6111  
Office Hours: 2:30 – 4:00 PM, MTWR  
Email Address: dmills@southeasterntech.edu  
Phone: 478-289-2323  
Fax Number: 478-289-2276

**REQUIRED TEXT**

Introduction to Computer Numerical Control (CNC), Fifth Edition, James V. Valentino, Joseph Goldenberg, ISBN-13: 978-0-13-217603-3, ISBN-10: 0-13-217603-3

**REQUIRED SUPPLIES & SOFTWARE**

Pens, Pencils, Paper, Safety Glasses

**COURSE DESCRIPTION**

This course provides instruction for the safe operation and manual programming of computer numerical controlled (CNC) milling machines. Topics include: safety, calculation for programming, program codes and structure, program run and editing of programs.

**MAJOR COURSE COMPETENCIES**

Safety, Programming Calculations, Program Codes and Structure, Program Run and Editing

**PREREQUISITE(S)**

MCHT1012 – Blueprint for Machine Tool  
MCNT1013 – Machine Tool Math

## COURSE OUTLINE

- 1 Safety
  - A. Explain the safe measures and problems with automated movements of machine tables with varying heights of work pieces and fixture parts.
  - B. Demonstrate programming procedures for safe part run.
  - C. Identify safety problems with tool changes or part load/unload positions.
  
- 2 Programming Calculations
  - A. Calculate proper feeds, speeds and depth of cuts for given cutters for given part programs for the CNC milling machine.
  - B. Calculate proper cutter positions for rough and finish passes on given part shapes when programming for a CNC milling machine.
  - C. Calculate drilling depth for given drill diameters for thru holes in CNC mill programs.
  - D. Calculate drill peck amounts for given drill diameter and part materials for CNC mill programs.
  - E. Calculate feeds and speeds for rigid tapping.
  
- 3 Program Codes and Structure
  - A. Define the various G and M codes and their functions used in CNC mill programming.
  - B. Discuss the related machine tool movements resulting from the codes entered into the programmable controller of a CNC milling machine.
  - C. Determine order of operations, part holding and part referencing for given part programs to be ran on a CNC mill.
  - D. Determine proper tooling for given part programs to be ran on a CNC mill.
  - E. Program linear and circular interpolation moves on a CNC mill.
  - F. Program required hole operations on a CNC milling machine for a given part shape.
  - G. Demonstrate proper use of canned cycles in CNC mill part programming.
  - H. Demonstrate proper use of cutter diameter compensation in CNC mill programming.
  - I. Discuss use of program looping and sub-programs in CNC mill programming.
  
- 4 Program Run and Editing
  - A. Setup and load part programs in a CNC milling machine for part run.
  - B. Dry run part programs for checking purposes on a CNC milling machine.
  - C. Trouble shoot part program for programming errors and part dimensional accuracy.
  - D. Edit part program for optimal program run time and tool life.

## GENERAL EDUCATION CORE COMPETENCIES

STC 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 come prepared for each class meeting, focused and ready to learn.

Homework assignments will be collected for a grade.

There may be in class graded activities planned in which you will not be able to participate if you are not prepared for that day's class.

Unannounced quizzes or in class assignments are subject to be given every day. A grade of zero will be assigned for any quizzes or in class assignments missed.

Students are expected to complete all tests, and other assignments on the scheduled dates.

Students are responsible for policies and procedures include in the STC Catalog.

## **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.

## **SPECIAL NEEDS**

Students with disabilities who believe that they may need accommodations in this class based on the impact of a disability are encouraged to contact Helen Thomas, 912-538-3126, [hthomas@southeasterntech.edu](mailto:hthomas@southeasterntech.edu), to coordinate reasonable accommodations.

## **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 advise me and make appropriate arrangements with Helen Thomas, 912-538-3126, [hthomas@southeasterntech.edu](mailto:hthomas@southeasterntech.edu).

## WITHDRAWAL PROCEDURE

Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% portion of the semester (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" is assigned when the student completes the withdrawal form from the course.

Students who are dropped from courses due to attendance (see your course syllabus for attendance policy) after drop/add until the 65% point of the semester will receive a "W" for the course. Abandoning a course(s) instead of following official withdrawal procedures may result in a grade of 'F' being assigned.

After the 65% portion of the semester, the student will receive a grade for the course. (Please note: A zero will be given for all missed assignments.)

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. All grades, including grades 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...)

Makeup of tests, quizzes and other assignments will only be considered where arrangements are made prior to completion date scheduled or test dates.

## ACADEMIC DISHONESTY POLICY

The STC Academic Dishonesty Policy states 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 STC Catalog and Student 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" 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 second 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 and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, sex, 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 school is in compliance with Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, or national origin; with the provisions of Title IX of the Educational Amendments of 1972, which prohibits discrimination on the basis of gender; with the provisions of Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination on the basis of handicap; and with the American with Disabilities Act (ADA).

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

<b>ADA/Section 504 - Equity- Title IX (Students) - OCR Compliance Officer</b>	<b>Title VI - Title IX (Employees) - EEOC Officer</b>
Helen Thomas, Special Needs Specialist Vidalia Campus 3001 East 1 <sup>st</sup> Street, Vidalia Office 108 Phone: 912-538-3126 <a href="mailto:hthomas@southeasterntech.edu">hthomas@southeasterntech.edu</a>	Blythe Wilcox, Director of Human Resources Vidalia Campus 3001 East 1 <sup>st</sup> Street, Vidalia Office 138B Phone: 912-538-3147 <a href="mailto:bwilcox@southeasterntech.edu">bwilcox@southeasterntech.edu</a>

## GRIEVANCE PROCEDURES

Grievance procedures can be found in the Catalog and Handbook located on STC'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 [STC website](#).

## 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

<b>Assessment/Assignment</b>	<b>Percentage</b>
Tests	70%
Final Exam	15%
Homework, Quizzes, in class Assignments	15%

## GRADING SCALE

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