



**ELCR-2160 Advanced Microprocessors and Robotics
COURSE SYLLABUS
Spring Semester 2020**

COURSE INFORMATION

Credit Hours/Minutes: 3 Hours / 3000 Minutes
Class Location: Gillis Building, Room 827, Vidalia Campus
Class Meets: Monday and Wednesdays (MW), 3:00 PM to 4:40 PM
Course Reference Number (CRN): 40045

INSTRUCTOR CONTACT INFORMATION

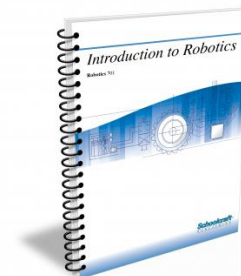
Instructor Name: William Greene
Office Location: Gillis Building, Room 822, Vidalia Campus
Office Hours: Monday through Thursday, 11:00 AM to Noon; Tuesday and Thursday, 1:00 PM to 3:00 PM
Email Address: [William Greene \(wgreene@southeasterntech.edu\)](mailto:wgreene@southeasterntech.edu)
Phone: (912) 538-3102
Fax Number: (912) 538-3106

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 \(http://www.southeasterntech.edu/student-affairs/catalog-handbook.php\)](http://www.southeasterntech.edu/student-affairs/catalog-handbook.php).

REQUIRED TEXT

Introduction to Robotics,
Manufacturing Series 701
by James A. Rehg,
published by Schoolcraft Publishing,
available through the STC Bookstore



REQUIRED SUPPLIES & SOFTWARE

Thumb Drive Storage Device with 2 GByte of storage or larger

Note: Although students can use their smart phones and tablets to access their online course(s), exams, discussions, assignments, and other graded activities should be performed on a personal computer. Neither Blackboard nor Georgia Virtual Technical Connection (GVTC) provide technical support for issues relating to the use of a smart phone or tablet so students are advised to not rely on these devices to take an online course.

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

COURSE DESCRIPTION

This course is designed to provide sufficient coverage of digital electronics and microprocessor fundamentals. Digital fundamentals will introduce basic topics such as binary arithmetic, logic gates and truth tables, Boolean algebra and minimization techniques, logic families, and digital test equipment. Upon completion of the foundational digital requirements, a more advanced study of digital devices and circuits will include such topics as flip-flops, counters, multiplexers and de-multiplexers, encoding and decoding, displays, and analog to digital and digital to analog conversions. Students will also explore the basic architecture and hardware concepts of the microprocessor.

MAJOR COURSE COMPETENCIES / COURSE OUTLINE

1. Microprocessor Instruction Set
2. Programming and Debugging Applications and Troubleshooting
3. Microprocessor Applications for Embedded Systems
4. Basic DSP Concepts
5. Robotic Terminology and Languages
6. Robotic Programming

PREREQUISITE(S)

ELCR 2130, ELCR 2140, and ELCR 2150

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 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 Catalog and Handbook](#). All online students must pledge that they have read and understand the STC Online Orientation within the first five days of class. Online students are responsible for checking e-mails and Blackboard announcements DAILY.

TRADITIONAL 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" (Failing 0-59) 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: [Macy Gay mgay@southeasterntech.edu](mailto:Macy.Gay@southeasterntech.edu), 478-289-2274, Building 1, Room 1210

Vidalia Campus: [Helen Thomas hthomas@southeasterntech.edu](mailto:Helen.Thomas@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: [Macy Gay mgay@southeasterntech.edu](mailto:Macy.Gay@southeasterntech.edu), 478-289-2274, Building 1, Room 1210

Vidalia Campus: [Helen Thomas hthomas@southeasterntech.edu](mailto:Helen.Thomas@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" 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 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' 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.

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

Students are required to take all tests and complete all assignments scheduled during the semester. Failure to take Tests/Exam(s) and complete assignments will result in a grade of zero. There will be no makeup of assignments or EXAMS. If Internet or browser failure occurs, contact instructor immediately. A decision will be made at that time if the exam will be reset. Instructor reserves the right to deduct points from the exam

scores for exceeding the scheduled time limit on the exam and/or requiring student to come to campus to take the final exam. Note: If student notifies instructor about exam problems because of technical issues after the due date or on the last day of the semester, the student will NOT be allowed to make-up the exam. No exceptions! Assignments must be turned in on the assigned date and will not be accepted late, a grade of zero will be given. ALL Assignments are due according to the lesson plan.

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:

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

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
Exams	45%
Microprocessor Programs	35%
Robot Program	20%

GRADING SCALE

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

ELCR-2160 Advanced Microprocessors and Robotics Spring Semester 2020 Lesson Plan

WEEK 1 (JAN IS JANUARY)

Date	Chapter/ Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 7				
Jan 8	Download Material	Class Introduction – Syllabi, Outline, Rules, and Regulations Coverage	[On BLACKBOARD] Read / Review Getting Started POST to appropriate Message Boards Download/Print Support Material	1, a,b,c
Jan 9			Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.	
Jan 13	Download Material	Microprocessor Simulator Download and Review	Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.	1,2, b,c

WEEK 2

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 14			Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.	
Jan 15	Download Material	Review Microprocessor Text / Conversions Simulator: Review of Operation	Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.	1,2, b,c
Jan 16			Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.	
Jan 20	None	HOLIDAY – MLK Day	HOLIDAY – MLK Day	None
Jan 21			Begin 01FIRST Project Attach the file to an e-mail and send to your instructor.	

WEEK 3

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 22	Download Material	Review Microprocessor Text / Conversions Simulator: 01FIRST Project	Submit 01FIRST Project Attach the file to an e-mail and send to your instructor.	1,2,3, a,b,c
Jan 23			Begin 02LIGHT Project Study for Microprocessor Architecture Exam	
Jan 27	Download Material	Test 1: Microprocessor Architecture & Number Systems Exam Simulator: 02LIGHT Project	Take Microprocessor Architecture Exam Demo/Submit 02LIGHT Project	1,2,3, a,b,c
Jan 28			Begin 03MOVE Project	

WEEK 4 (FEB IS FEBRUARY)

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 29	Download Material	Simulator: 03MOVE Project	Demo/Submit 03MOVE Project	1,2,3,4, a,b,c
Jan 30			Begin 04INCJMP Project	
Feb 3	Download Material	Simulator: 04INCJMP Project	Continue 04INCJMP Project	1,2,3,4, a,b,c
Feb 4			Continue 04INCJMP Project	

WEEK 5

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 5	Download Material	Simulator: 04INCJMP Project	Demo/Submit 04INCJMP Project	1,2,3,4, a,b,c
Feb 6			Begin 05KEYBIN Project	
Feb 10	Download Material	Simulator: 05KEYBIN Project	Continue 05KEYBIN Project	1,2,3,4, a,b,c
Feb 11				

WEEK 6

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 12	Download Material	Simulator: 05KEYBIN Project	Demo/Submit 05KEYBIN Project	1,2,3,4, a,b,c
Feb 13			Begin 06LIFT Project	
Feb 17	Download Material	Simulator: 06LIFT Project	Continue 06LIFT Project	1,2,3,4, a,b,c
Feb 18			Continue 06LIFT Project	

WEEK 7

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 19	Download Material	Simulator: 06LIFT Project	Demo/Submit 06LIFT Project	1,2,3,4, a,b,c
Feb 20			Study for Microprocessor Programming & Commands Exam	
Feb 24	Download Material	Test 2: Microprocessor Programming & Commands Exam	Take Microprocessor Programming & Commands Exam	1,2,3,4, a,b,c
Feb 25			Read Chapter One Introduction to Robotics 701	

WEEK 8 (MAR IS MARCH)

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 26	1	Chapter One – Robotics in Automated Manufacturing IN CLASS – Robot Training	Review Chapter One	5,6, a,b,c
Feb 27			Take Robotics Chapter One Exam	
Mar 2	2	Chapter Two – The Basic Robot System IN CLASS – Robot Training / Programs MIDTERM	Read Chapter Two	5,6, a,b,c
Mar 3			Review Chapter Two	

WEEK 9

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 4	2	Robotics Chapter Two Test	Take Robotics Chapter Two Exam Read Chapter Three Introduction to Robotics 701	5,6, a,b,c
Mar 5	None	STAFF DEVELOPMENT DAY (No Electronics Classes)	STAFF DEVELOPMENT DAY (No Electronics Classes)	None
Mar 9	3	Chapter Three – Robot Classification I IN CLASS – Robot Programming	Review Chapter Three	5,6, a,b,c
Mar 10			Review Chapter Three	
Mar 11		IN CLASS – Robot Programming	Review Chapter Three	5,6, a,b,c

WEEK 10

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 12	None	65% Point – Last Day to Withdraw	Review Chapter Three	
Mar 16	3	Robotics Chapter Three Test	Take Robotics Chapter Three Exam	5,6, a,b,c
Mar 17			Read Chapter Four Introduction to Robotics 701	
Mar 18	4	Chapter Four – Robot Classification II IN CLASS – Robot Programming	Review Chapter Four	5,6, a,b,c

WEEK 11

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 19			Review Chapter Four	
Mar 23	5	Robotics Chapter Four Test	Take Robotics Chapter Four Exam	5,6, a,b,c
Mar 24			Read Chapter Five Introduction to Robotics 701	
Mar 25	5	Chapter Five – Work-Cell Sensors IN CLASS – Robot Programming	Review Chapter Five	5,6, a,b,c

WEEK 12 (APR IS APRIL)

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 26			Review Chapter Five	
Mar 30	5	Robotics Chapter Five Test	Take Robotics Chapter Five Exam	5,6, a,b,c
Mar 31			Read Chapter Six Introduction to Robotics 701	
Apr 1	6	Chapter Six – End-of-Arm Tooling IN CLASS – Robot Programming	Review Chapter Six	5,6, a,b,c

WEEK 13

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 2			Review Chapter Six	
Apr 6 – 9		SPRING BREAK	SPRING BREAK	None
Apr 13	7	Robotics Chapter Six Test	Take Robotics Chapter Six Exam	5,6, a,b,c
Apr 14			Read Chapter Seven Introduction to Robotics 701	5,6, a,b,c
Apr 15	7	Chapter Seven – Robot Teaching and Programming IN CLASS – Robot Programming	Review Chapter Seven	5,6, a,b,c

WEEK 14

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 16			Review Chapter Seven	
Apr 20	7	Robotics Chapter Seven Test	Take Robotics Chapter Seven Exam	5,6, a,b,c
Apr 21			Tweak your Robot Programs	
Apr 22	1 – 7	IN CLASS – Robot Program Demo	Demonstrate Student Robot Programs	5,6, a,b,c

WEEK 15

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 23			Tweak your Robot Programs	
Apr 27	1 – 7	IN CLASS – Robot Program Demo	Demonstrate Student Robot Programs	5,6, a,b,c
Apr 28			Tweak your Robot Programs	
Apr 29	1 – 7	Semester Classes End	Demonstrate Student Robot Programs	5,6, a,b,c

FINALS WEEK

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 30	Download Material & 1 – 7	Final Exam	Take Final Exam	1,2,3,4,5,6, a,b,c
May 4	Download Material & 1 – 7	Final Exam	Take Final Exam	1,2,3,4,5,6, a,b,c

COMPETENCY AREAS:

1. Microprocessor Instruction Set
2. Programming and Debugging Applications and Troubleshooting
3. Microprocessor Applications for Embedded Systems
4. Basic DSP Concepts
5. Robotic Terminology and Languages
6. Robotic Programming

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.

DISCLAIMER STATEMENTS:

- (1) Instructor reserves the right to change the syllabus and/or lesson plan as necessary.
- (2) The official copy of the syllabus is located inside the student's online course shell or will be given to them during face to face class time the first day of the semester. The syllabus displayed in advance of the semester in a location other than the course you are enrolled in is for planning purposes only.