ELCR-2160 Advanced Microprocessors and Robotics
COURSE SYLLABUS
Spring Semester 2018

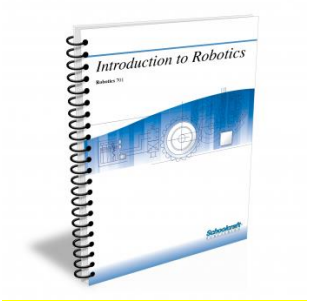
COURSE INFORMATION
Credit Hours/Minutes: 3 Hours / 3000 Minutes
Class Location: Gillis Building, Room 827, Vidalia Campus
Class Meets: Monday and Wednesdays (MW), 3:00 PM to 4:40 PM
Course Reference Number (CRN): 40154

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)
Phone: (912) 538-3102
Fax Number: (912) 538-3106

SOUTHEASTERN TECHNICAL COLLEGE'S (STC) CATALOG AND STUDENT HANDBOOK
Students are responsible for all policies and procedures and all other information included in Southeastern Technical College's Catalog and Student Handbook (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.

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 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 Student 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.

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 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.

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 (hthomas@southeasterntech.edu), 912-538-3126, 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 (hthomas@southeasterntech.edu), 912-538-3126.

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" (Withdrawn) 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 speak with a representative of the Financial Aid Office to determine any financial penalties that may be accessed 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.)
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 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" (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 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:

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 1st Street, Vidalia Office 108 Phone: 912-538-3126 Email: Helen Thomas hthomas@southeasterntech.edu	Blythe Wilcox, Director of Human Resources Vidalia Campus 3001 East 1st Street, Vidalia Office 138B Phone: 912-538-3147 Email: Blythe Wilcox bwilcox@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).

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

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.

ELCR-2160 Advanced Microprocessors and Robotics
Spring Semester 2018 Lesson Plan

WEEK 1

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 8		Class Introduction – Syllabi, Outline, Rules, and Regulations Coverage	**[On Blackboard]** Read / Review **START HERE** information POST to appropriate **Message Boards** **Download/Print Support Material**	1, a,b,c
Jan 9	Download Material		**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	
Jan 10	Download Material	Microprocessor Simulator Download and Review	**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	
Jan 11	Download Material		**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	

WEEK 2

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 15	None	**Holiday**	**Holiday**	None
Jan 16	Download Material		**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	
Jan 17	Download Material	Review Microprocessor Text / Conversions Simulator: Review of Operation	**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	
Jan 18	Download Material		**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	
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.**	

WEEK 3

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 23	Download Material		**Study Micro Text (Pages 4 to 7), Number Conversions, ASCII table.**	
Jan 24	Download Material	Review Microprocessor Text / Conversions Simulator: 02LIGHT Project	**Begin 02LIGHT Project**	
Jan 25	Download Material	Test 1: Microprocessor Architecture & Number Systems Exam	**Take Microprocessor Architecture Exam**	
Jan 29	Download Material	Simulator: 03MOVE Project	**Demo/Submit 02LIGHT Project** **Demo/Submit 03MOVE Project**	

WEEK 4

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Jan 30	Download Material			
Jan 31	Download Material	Simulator: 04INCJMP Project	**Begin 04INCJMP Project**	
Feb 1	Download Material		**Continue 04INCJMP Project**	
Feb 5	Download Material	Simulator: 04INCJMP Project	**Demo/Submit 04INCJMP Project**	

WEEK 5

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 6	Download Material			
Feb 7	Download Material	Simulator: 05KEYBIN Project	**Begin 05KEYBIN Project**	
Feb 8	Download Material		**Continue 05KEYBIN Project**	
Feb 12	Download Material	Simulator: 05KEYBIN Project	**Demo/Submit 05KEYBIN Project**	

WEEK 6

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 13	Download Material			
Feb 14	Download Material	Simulator: 06LIFT Project	**Begin 06LIFT Project**	
Feb 15	Download Material		**Continue 06LIFT Project**	
Feb 19	Download Material	Simulator: 06LIFT Project	**Demo/Submit 06LIFT Project**	

WEEK 7

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 20	Download Material		**Study your programs and commands**	
Feb 21	Download Material	Test 2: Microprocessor Programming & Commands Exam	**Take Microprocessor Programming & Commands Exam**	
Feb 22	**1**		**Read Chapter One Introduction to Robotics 701**	
Feb 26	**1**	Chapter One – Robotics in Automated Manufacturing IN CLASS – Robot Training	**Read Chapter One Introduction to Robotics 701**	

WEEK 8

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Feb 27	**1**		**Review Chapter One**	
Feb 28	**1**	Robotics Chapter One Test	**Take Robotics Chapter One Exam**	
Mar 1	**2**	**MID-TERM**	**Read Chapter Two Introduction to Robotics 701**	
Mar 5	**2**	Chapter Two – The Basic Robot System IN CLASS – Robot Training / Programs	**Review Chapter Two**	

WEEK 9

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 6	**2**		**Review Chapter Two**	
Mar 7	**2**	Robotics Chapter Two Test	**Take Robotics Chapter Two Exam**	
Mar 8	**3**		**Read Chapter Three Introduction to Robotics 701**	
Mar 12	**3**	Chapter Three – Robot Classification I IN CLASS – Robot Programming	**Review Chapter Three**	

WEEK 10

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 13	**3**	60% Semester Point	**Review Chapter Three**	
Mar 14	**3**	Robotics Chapter Three Test	**Take Robotics Chapter Three Exam**	
Mar 15	**4**		**Read Chapter Four Introduction to Robotics 701**	
Mar 19	**4**	Chapter Four – Robot Classification II IN CLASS – Robot Programming 65% Drop Deadline for Classes	**Review Chapter Four**	

WEEK 11

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 20	**4**		**Review Chapter Four**	
Mar 21	**4**	Robotics Chapter Four Test	**Take Robotics Chapter Four Exam**	
Mar 22	**5**		**Read Chapter Five Introduction to Robotics 701**	
Mar 26	**5**	Chapter Five – Work-Cell Sensors IN CLASS – Robot Programming	**Review Chapter Five**	

WEEK 12

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Mar 27	**5**		**Review Chapter Five**	
Mar 28	**5**	Robotics Chapter Five Test	**Take Robotics Chapter Five Exam**	
Mar 29	**6**		**Read Chapter Six** **Introduction to Robotics 701**	
Apr 2-5	None	SPRING BREAK	**SPRING BREAK**	None
Apr 9	**6**	Chapter Six – End-of-Arm Tooling IN CLASS – Robot Programming	**Review Chapter Six**	

WEEK 13

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 10	**6**			
Apr 11	**6**	Robotics Chapter Six Test	**Take Robotics Chapter Six Exam**	
Apr 12	**7**		**Read / Review Chapter Seven** **Introduction to Robotics 701**	
Apr 16	**7**	Chapter Seven – Robot Teaching and Programming IN CLASS – Robot Programming	**Read / Review Chapter Seven** **Introduction to Robotics 701**	

WEEK 14

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 17	**7**		**Review Chapter Seven**	
Apr 18	**7**	Robotics Chapter Seven Test	**Take Robotics Chapter Seven Exam**	
Apr 19			**Tweak your Robot Program**	
Apr 23	**1 – 7**	IN CLASS – Robot Program Demo	**Demonstrate Student Robot Programs**	

WEEK 15

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
Apr 24	**1 – 7**		**Tweak your Robot Program**	
Apr 25	**1 – 7**	IN CLASS – Robot Program Demo	**Demonstrate Student Robot Programs**	
Apr 26	**1 – 7**		**Demonstrate Student Robot Programs**	
Apr 30	**1 – 7**	IN CLASS – Robot Program Demo	**Demonstrate Student Robot Programs**	
May 1	**1 – 7**	Semester Classes End	**Demonstrate Student Robot Programs**	

FINALS WEEK

Date	Chapter / Lesson	Content	Assignments & Tests Due Dates	Competency Area
May 2	Download Material & **1 – 7**	Final Exam	**Take Final Exam**	
May 3	Download Material & **1 – 7**	Final Exam	**Take Final Exam**	

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.