



ELCR 2160 – Advanced Microprocessors and Robotics
COURSE SYLLABUS
SPRING SEMESTER 2017 (201714)

Course Title: Advanced
Microprocessors and
Robotics
Course Number: ELCR 2160
Credit Hr / Min: 3 hr / 3000 min
Class Location: RMTC Room 827
Class Meets: MW, 3:00 to 4:40 p.m.
CRN: 40149

Instructor: William Greene
Office Hours: Mon –Thurs 8:00–9:00, 11–Noon
Mon & Wed 1:00 pm – 3:00 pm
Office: RMTC Room 822, Vidalia Campus
E-mail: wgreene@southeasterntech.edu
Phone: 912-538-3102 FAX: 912-538-3106
Preferred contact method is e-mail

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

RECOMMENDED SUPPLIES: Thumb Drive Storage Device with \geq 2GByte of storage

COURSE DESCRIPTION: This course continues an earlier study of microprocessor fundamentals and introduces robotic theory and application. Topics include the microprocessor instruction set, programming and debugging applications and troubleshooting, microprocessor applications for embedded systems, basic DSP concepts, robotic terminology and languages, and robotic programming.

PREREQUISITES: ELCR-2130, ELCR-2140, and ELCR-2150

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

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 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 E-Catalog*. 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 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.

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.

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, to coordinate reasonable accommodations.

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.

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...): 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 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:

--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.

--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.

--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

Southeastern Technical College does not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, disabled veteran, veteran of Vietnam Era 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).

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 at www.southeasterntech.edu.

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.

ELCR-2160

GRADING POLICY:

Exams	45%
Micro Programs	35%
Robot Program	<u>20%</u>
Total	100%

GRADING SCALE

A	(90-100)
B	(80-89)
C	(70-79)
D	(60-69)
F	(0-59)

For **any** course to count as credit for graduation, student must make a C or higher in the course.

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
LESSON PLAN
Spring Semester 2017 (CRN 40149)

Color Codes: **Black** = Assignments & Information, **Blue** = Graded Assignments

Date	Chapter/ Lesson	Content	Assignments & Tests (Due Dates)	*Comp. Area
WEEK 1				
Jan 9		Class Introduction – Syllabi, Outline, Work Ethics, Rules, and Regulations Coverage For any assigned reading, complete the Section Checkups at the end of each Section. It is a great way to review what you have read.	[On Blackboard] Read / Review START HERE information POST to appropriate Message Boards Download/Print Support Material located under: Course Work => Course Documents	1,a,b,c
10	Download Material		Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
11	Download Material	Microprocessor Simulator Download and Review	Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
12	Download Material		Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
WEEK 2				
Jan 16		HOLIDAY	HOLIDAY	
17	Download Material		Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
18	Download Material	Review Microprocessor Text / Conversions Simulator: Review of Operation	Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
19	Download Material		Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
23	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				
Jan 24	Download Material		Study Micro Text (Pages 4 through 7), Number Conversions, and ASCII table.	
25	Download Material	Review Microprocessor Text / Conversions Simulator: 02LIGHT Project	Begin 02LIGHT Project	
26	Download Material	Test 1: Microprocessor Architecture & Number Systems Exam	Take Microprocessor Arch. Exam	
30	Download Material	Simulator: 03MOVE Project	Demo/Submit 02LIGHT Project Demo/Submit 03MOVE Project	

WEEK 4				
Jan 31	Download Material			
Feb 1	Download Material	Simulator: 04INCJMP Project	Begin 04INCJMP Project	
2	Download Material		Continue 04INCJMP Project	
6	Download Material	Simulator: 04INCJMP Project	Demo/Submit 04INCJMP Project	
WEEK 5				
Feb 7	Download Material			
8	Download Material	Simulator: 05KEYBIN Project	Begin 05KEYBIN Project	
9	Download Material		Continue 05KEYBIN Project	
13	Download Material	Simulator: 05KEYBIN Project	Demo/Submit 05KEYBIN Project	
WEEK 6				
Feb 14	Download Material			
15	Download Material	Simulator: 06LIFT Project	Begin 06LIFT Project	
16	Download Material		Continue 06LIFT Project	
20	Download Material	Simulator: 06LIFT Project	Demo/Submit 06LIFT Project	
WEEK 7				
Feb 21	Download Material		Study your programs and commands	
22	Download Material	Test 2: Microprocessor Programming & Commands Exam	Take Microprocessor Prog. Exam	
23	1		Read Chapter One Introduction to Robotics – Robotics 701	
27	1	Chapter One – Robotics in Automated Manufacturing IN CLASS – Robot Training	Review Chapter One Introduction to Robotics – Robotics 701	
WEEK 8				
Feb 28	1		Review Chapter One	
Mar 1	1	Robotics Chapter One Test	Take Robotics Chapter One Exam	
2	2	MID-TERM	Read Chapter Two Introduction to Robotics – Robotics 701	
6	2	Chapter Two – The Basic Robot System IN CLASS – Robot Training / Programs	Review Chapter Two	

WEEK 9				
Mar 7	2		Review Chapter Two	
8	2	Robotics Chapter Two Test	Take Robotics Chapter Two Exam	
9	3		Read Chapter Three Introduction to Robotics – Robotics 701	
13	3	Chapter Three – Robot Classification I IN CLASS – Robot Programming	Review Chapter Three	
WEEK 10				
Mar 14	3	60% Semester Point	Review Chapter Three	
15	3	Robotics Chapter Three Test	Take Robotics Chapter Three Exam	
16	4		Read Chapter Four Introduction to Robotics – Robotics 701	
20	4	Chapter Four – Robot Classification II IN CLASS – Robot Programming 65% Drop Deadline for Classes	Review Chapter Four	
WEEK 11				
Mar 21	4		Review Chapter Four	
22	4	Robotics Chapter Four Test	Take Robotics Chapter Four Exam	
23	5		Read Chapter Five Introduction to Robotics – Robotics 701	
27	5	Chapter Five – Work-Cell Sensors IN CLASS – Robot Programming	Review Chapter Five	
WEEK 12				
Mar 28	5		Review Chapter Five	
29	5	Robotics Chapter Five Test	Take Robotics Chapter Five Exam	
30	6		Read Chapter Six Introduction to Robotics – Robotics 701	
Apr 3	6	Chapter Six – End-of-Arm Tooling IN CLASS – Robot Programming	Review Chapter Six	

WEEK 13				
Apr 4	6			
5	6	Robotics Chapter Six Test	Take Robotics Chapter Six Exam	
6	7	SPRING ACTIVITY DAY	Read / Review Chapter Seven Introduction to Robotics – Robotics 701	
10	7	Chapter Seven – Robot Teaching and Programming IN CLASS – Robot Programming	Read / Review Chapter Seven Introduction to Robotics – Robotics 701	
WEEK 14				
Apr 11	7		Review Chapter Seven	
12	7	Robotics Chapter Seven Test	Take Robotics Chapter Seven Exam	
13			Tweak your Robot Program	
17	1 – 7	IN CLASS – Robot Program Demo	Demonstrate Student Robot Programs	
WEEK 15				
Apr 18	1 – 7		Tweak your Robot Program	
19	1 – 7	IN CLASS – Robot Program Demo	Demonstrate Student Robot Programs	
20			Demonstrate Student Robot Programs	
24	1 – 7	SEMESTER ENDS	Study for Final Exam	
FINALS WEEK				
Apr 26	Download Material & 1 – 7	Final Exam	Take Final Exam	
Apr 27	Download Material & 1 – 7	Final Exam	Take Final Exam	

*** Competency Areas:**

Electronics Technology Competency Areas:

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

General Core Competency Areas:

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