INSTRUCTIONAL PACKAGE

EET 253

Microprocessors

Effective Term

Summer 2018

INSTRUCTIONAL PACKAGE

PART I: COURSE INFORMATION

Effective Term: 2017.30

COURSE PREFIX: EET 253   COURSE TITLE: Microprocessors

CONTACT HOURS: 6   CREDIT HOURS: 4

RATIONALE FOR THE COURSE:

EET 253 serves to acquaint the student with microprocessor/microcontroller software and hardware principles, including industry-standard types focusing on embedded systems.

COURSE DESCRIPTION:

This course is a study of software and hardware interfacing techniques. Circuits are modeled, constructed, and tested.

PREREQUISITES/CO-REQUISITES:

Credit level EET 210 Minimum Grade of C or Credit level EET 210 Minimum Grade of TC.

REQUIRED MATERIALS:

Text:

> *Designing Embedded Systems with PIC® Microcontrollers – 2/E*
>   Tim Wilmhurst
>   ISBN-13: 9781856177504
>   ©2010 • Newnes/Elsevier

Other:

> Scientific calculator, USB flash drive.

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

[BOOKSTORE](#).

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's student portal for course materials.
WaveNet and D2L email access.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

PART II: STUDENT LEARNING OUTCOMES

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

UNIT #1

Materials Covered: Introduction to Embedded Control, PIC Mid-Range Family, Parallel Ports, Power Supply, and Clock Oscillator.

*Assessment(s): Homework Assignments, Labs, Exam, Participation, Final Exam.

Learning Outcomes:

Introduction

- Define Embedded Systems.
- Describe examples of Embedded Systems.
- Describe the elements of a computer.
- Discuss Instruction Sets: CICS and RISC.
- Describe Memory Types.
- Discuss Computer Architectures.
- Compare/contrast microprocessors and microcontrollers.

Mid-Range Microcontrollers

- Discuss Status Register.
- Describe Memory Technologies.
- Describe 16F84A Memory.
- Discuss Timing.
- Describe Power-up and Reset.

Parallel Ports, Power Supply, and Clock Oscillator

- Describe Parallel Interface
- Discuss Electrical characteristics
- Describe Switches
- Describe LEDs
- Discuss the clock oscillator
- Discuss Power supply

UNIT #2

Materials Covered: Introduction to Assembler, Building Assembler Programs

*Assessment(s): Homework Assignments, Labs, Exam, Participation, Final Exam

Learning Outcomes:

Introduction to Assembler

- Discuss software development cycle.

- Describe PIC 16 instruction set.
- Describe format of an assembler program.
- Discuss simulation.
- Describe downloading to the target.

Building Assembler Programs

- Discuss program structure.
- Describe conditional branching.
- Describe subroutines
- Discuss time delays.
- Describe breakpoints.
- Describe look-up tables.

UNIT #3

Materials Covered: Interrupts, Counters, Timers, Human and Physical Interface.

****Assessment(s):*** Homework Assignments, Labs, Exam, Participation, Final Exam

Learning Outcomes:

Interrupts, Counters, Timers

- Describe interrupts.
- Discuss programming with interrupts.
- Apply interrupts to timers and counters.
- Discuss watchdog timer.
- Describe sleep mode.
- Discuss interrupt latency.

Human and Physical Interface

- Describe switches and keypads.
- Describe LED displays.
- Describe liquid crystal displays.
- Describe sensors.
- Describe actuators.

****Students – please refer to the Instructor's Course Information sheet for specific information on assessments and due dates.***

PART III: GRADING AND ASSESSMENT

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*

Students' performance will be assessed and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Exams 30%
Labs 30%
Homework Assignments 20%
Class Participation 5%
Final Exam .... <u>15%</u>
                                               100%

Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.

GRADING SYSTEM:

HGTC has a standardized, recommended grading scale for academic courses. The grading scale requires that grades within the indicated range be defined as follows:

 A: 90-100   B: 80-89   C: 70-79   D: 60-69   F: Below 60

The following grades are used:

A - EXCELLENT: used in GPA calculations; carries a value of 4 quality points and earns credit hours.

B - ABOVE AVERAGE: used in GPA calculations; carries a value of 3 quality points and earns credit hours.

C - AVERAGE: used in GPA calculations; carries a value of 2 quality points and earns credit hours.

D - BELOW AVERAGE: used in GPA calculations; carries a value of 1 quality point and earns credit hours.

F - FAILURE: used in GPA calculations; carries a value of 0 quality points and earns 0 credit hours. (Hours attempted are used in GPA calculations.)

I - INCOMPLETE: does not affect GPA calculations; defaults to "F" automatically after one term if the incomplete work has not been completed and generates 0 quality points and 0 credit hours. (See special note below.)

WF - WITHDRAWN FAILURE: used in GPA calculations; carries a value of 0 quality points and earns 0 credit hours. (Hours attempted are used in GPA calculations.)

W - WITHDRAW: not used in GPA calculations; carries a value of 0 quality points and earns 0 credit hours. May be utilized when extenuating circumstances warrant.

Note: Regarding a grade of "I" (Incomplete): A grade of Incomplete ("I") is assigned when the student does not complete work or take the final exam due to illness or for other reasons over which the student has no control. This grade is given only with the approval of the professor involved. An incomplete must be completed by the end of the following term. Otherwise, the grade becomes an automatic failure ("F").

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop ([ACADEMIC CALENDAR](#)). You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

PART IV: ATTENDANCE

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of eighty percent (80%) of his or her classes in order to be eligible to receive credit for any course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. At a minimum, a student may be withdrawn from a course(s) after he or she has been absent in excess of ten percent (10%) of the total contact hours for a course. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

PART V: STUDENT RESOURCES

The Student Success and Tutoring Center (SSTC)
The SSTC offers to all students the following **free** resources:
1. **Academic coaches** for most subject areas, **Writing Center Support**, and **college success skills.**
2. **On-line student success and academic support resources.**

Visit the SSTC website: [Student Success & Tutoring Center](#) and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455. Room locations and Live Chat is available on the SSTC website.

Student Information Center: WaveNet Central (WNC)

WNC offers to all students the following **free** resources:
1. **Getting around HGTC**: General information and guidance for enrollment!
2. Use the **Online Resource Center (ORC)** for COMPASS support, technology education, and online tools.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.

Visit the WNC website: Wavenet Central. Live Chat and Center locations are posted on the website. Or please call one of the following locations: WNC Conway, 349-5182; WNC Grand Strand, 477-2076; and WNC Georgetown, 520-1473.

Student Testing: (If course is offered in multiple format include this section, delete if only F2F sections are offered.)

Testing in an **online/hybrid** course may be accomplished in a variety of ways:
- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms

Further more tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through RPNow, our online proctoring service. To find out more about proctoring services, please visit the Online Testing section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

Disability Services

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to Jocelyn Williams, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

05/2018

Statement of Equal Opportunity/Non-Discrimination Statement

Horry Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, gender, national or ethnic origin, age, religion, disability, marital status, veteran status, sexual orientation, gender identity, or pregnancy in educational programs and/or activities.

Title IX Requirements

Horry Georgetown Technical College prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking. Any student who believe he or she has experienced or witnessed discrimination including sexual harassment, domestic violence, dating violence, sexual assault or stalking is encouraged to report such incidents to one of the College's Title IX Coordinators.

> *Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

Inquiries regarding the non-discrimination policies:	
Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Associate Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Associate Vice President for Human Resources.
Dr. Melissa Batten, AVP Student Affairs *Title IX Coordinator* Building 1100, Room 107A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5228 Melissa.Batten@hgtc.edu	**Jacquelyne Snyder, AVP Human Resources** *Section 504, Title II, and Title IX Coordinator* Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 Jacquelyne.Snyder@hgtc.edu