



Electronic Engineering Technology Student Learning

February, 2017

FDTC Curriculum Map							
Program: Electronics Engineering Technology							
Course #	Course Title	Credits	Hours		Program Outcomes	General Education Outcomes	
			Lecture	Lab			
MAT 110	College Algebra	3	3	0		1,6	
ENG 260	Advanced Technical Communications	3	3	0		2,3,4	
ENG 101	English Composition I	3	3	0		3,4	
ECO 201	Economic Concepts	3	3	0		4,5	
PHY 201	Physics I	4	3	3		5,6	
EGR 120	Engineering Computer Applications	3	3	0		6	
Elective	Humanities/Fine Arts	3	3	0		4,6	
EET 113	Electrical Circuits I	4	3	3	1,4		
EET 114	Electrical Circuits II	4	3	3	1,4		
EET 131	Active Devices	4	3	3	1,4		
EET 145	Digital Circuits	4	3	3	5		
EET 220	Analog Integrated Circuits	3	2	3	1,2,4		
EET 218	Electrical Power Systems	4	3	3	1,4		
EET 231	Industrial Electronics	4	3	3	1,2		
EET 235	Programmable Controllers	3	2	3	2,3		
EET 243	Data Communications	3	3	3	1,5		
EET 251	Microprocessor Fundamentals	4	3	3	5		
EET 273	Electronics Senior Project	1	0	3	1,2,3,4,5		
Program Outcomes							
1. demonstrate data organization skills, the ability to develop basic formulas and graphical output capability.							
2. wire and troubleshoot simple electrical machines.							
3. program and trouble shoot simple PLC programs.							
4. demonstrate the power flow of simple electronic circuits.							
5. demonstrate the design, construction, and operation of simple digital logic circuits.							
General Education Outcomes							
1. Quantitative Literacy							
2. Oral Communication							
3. Written Communication							
4. Reading Comprehension							
5. Information Literacy							
6. Critical Thinking							
7. Applied Technology							

Program: Electronics Engineering Technology

Course Student Learning Outcomes

EET 113 Electrical Circuits I

- | | |
|---|-----|
| 1) Use engineering notation and metric prefixes to represent large and small quantities | 1,4 |
| 2) Describe a basic electric circuit and make basic circuit measurements | 1,4 |
| 3) Recognize electrical hazards and practice proper safety procedures | 1,4 |
| 4) Calculate current, voltage, resistance, and power in a series/parallel circuit | 1,4 |
| 5) Identify a sinusoidal waveform and measure its characteristics | 1,4 |
| 6) Analyze sinusoidal waveform mathematically | 1,4 |

EET 114 Electrical Circuits II

- | | |
|---|-----|
| 1) Apply Circuit Theorems - Superposition, Millman, Norton, and Thevenin, to solve DC and AC circuits | 1,4 |
| 2) Analyze balance and unbalance bridge circuits | 1,4 |
| 3) Apply Mesh and Nodal Analysis to solve more complex AC and DC circuits | 1,4 |
| 4) Calculate the true power, apparent power, reactive power and power factor of AC circuits | 1,4 |
| 5) Construct Power Triangles for series, parallel and Series-parallel AC circuits | 1,4 |
| 6) Apply Delta-Wye conversion to simplify DC and AC circuit | 1,4 |

EET 145 Digital Circuits

- | | |
|---|---|
| 1) Identify various numbering systems | 5 |
| 2) Use Boolean algebra to simplify complex logic circuits | 5 |
| 3) Utilize timers in digital circuits effectively | 5 |
| 4) Utilize counters in digital circuits effectively | 5 |
| 5) Apply shift registers to data transfer circuits | 5 |

EET 131 Active Devices

- | | |
|--|-----|
| 1) Analyze the operation of half-wave, full-wave and bridge rectifiers | 1,4 |
|--|-----|

2) Describe the operation of diode limiters and diode clamping circuits							1,4		
3) Interpret diode and Transistor data sheet							1,4		
4) Troubleshoot Rectifier circuits							1,4		
5) Describe the operation of zener voltage regulators							1,4		
6) Describe the operation of light-emitting diodes							1,4		
7) Describe the structure, characteristic curves, and different biasing methods of a bipolar junction transistor							1,4		
EET 220 Analog Integrated Circuits									
1) Analyze op-amps with negative feedback							1,2,4		
2) Characterize op-amp circuits							1,2,4		
3) Describe and analyze the operation of several types of comparator circuits							1,2,4		
4) Describe and analyze the operation of summing amplifiers, integrators, and differentiators							1,2,4		
5) Describe and analyze the operation of instrumentation and isolation amplifiers							1,2,4		
6) Describe and analyze the operation of linear series and shunt regulators							1,2,4		
EET 218 Electrical Power Systems									
1) Describe the basic structure and operation of an SCR, diac., and triac							1,4		
2) Discuss several SCR applications							1,4		
3) Describe a transformer is constructed and how it operates							1,4		
4) Describe a practical transformer							1,4		
5) Discuss the advantages of three-phase generators in power applications							1,4		
6) Analyze three-phase connections							1,4		
7) Discuss power measurements in three-phase systems.							1,4		
EET 231 Industrial Electronics									
1) Discuss the concepts of Open-Loop and Closed-Loop control systems							1,2		
2) Discuss the application of controls in Industry							1,2		
3) Identify relay schematic symbols							1,2		
4) Describe the operation of AC/DC motors and drives							1,2		
5) Analyze three-phase power systems							1,2		
							1,2		

EET 235- - Programmable Controllers									
1) Describe basic PLC concepts								2,3	
2) Develop basic ladder programs								2,3	
3) Convert basic relay logic circuits to ladder logic programs								2,3	
4) Debug and modify complex programs								2,3	
5) Describe the logical operation of Timers and Counters								2,3	
EET 243- - Data Communications									
1) Describe the concept of waveguide theory								1,5	
2) Describe various digital communication techniques								1,5	
3) Describe the advantages and disadvantages of analog vs digital communication systems								1,5	
4) Select Fiber Optic cables for specific application								1,5	
5) Test and terminate Fiber Optic cables								1,5	
EET 251- - Microprocessor Fundamentals									
1) Perform the basic keypad function and data transfer of a 32-BIT MICROPROCESSOR								5	
2) Demonstrate memory transfers and explain the functions of memory control signals								5	
3) Describe and demonstrate the signals needed to transfer data between the 80386 CPU and I/O components								5	
4) Describe and execute the addressing modes of the 80386								5	
5) Explain the functions of registers within the 80386 CPU and use the immediate and register addressing modes to transfer an o								5	
EET 273- - Electronics Senior Project									
1) Demonstrate clear and accurate verbal communication								1,2,3,4,5	
2) Demonstrate clear and accurate written communication								1,2,3,4,5	
3) Demonstrate the ability to select and complete an electronic related project								1,2,3,4,5	

Program: Electronics Engineering Technology

Course Student Learning Outcomes

5-Year
Assessment Map

Fall 2017

EET 113 Electrical Circuits I

- 1) Use engineering notation and metric prefixes to represent large and small numbers 1,4
- 2) Describe a basic electric circuit and make basic circuit measurements 1,4
- 3) Recognize electrical hazards and practice proper safety procedures 1,4
- 4) Calculate current, voltage, resistance, and power in a series/parallel circuit 1,4
- 5) Identify a sinusoidal waveform and measure its characteristics 1,4
- 6) Analyze sinusoidal waveform mathematically 1,4

EET 114 Electrical Circuits II

Summer 2018

- 1) Apply Circuit Theorems - Superposition, Millman, Norton, and Thevenin, 1,4
- 2) Analyze balance and unbalance bridge circuits 1,4
- 3) Apply Mesh and Nodal Analysis to solve more complex AC and DC circuits 1,4
- 4) Calculate the true power, apparent power, reactive power and power factor 1,4
- 5) Construct Power Triangles for series, parallel and Series-parallel AC circuits 1,4
- 6) Apply Delta-Wye conversion to simplify DC and AC circuit 1,4

EET 145 Digital Circuits

Fall 2016

- 1) Identify various numbering systems 5
- 2) Use Boolean algebra to simplify complex logic circuits 5
- 3) Utilize timers in digital circuits effectively 5
- 4) Utilize counters in digital circuits effectively 5
- 5) Apply shift registers to data transfer circuits 5

Count of Students	Student Identification				FDTC Electronics Engineering Technology Degree Program Outcome 4 EET 220 - ANALOG INTEGRATED CIRCUITS demonstrate the power flow of simple electronic circuits.					
	Name		Sex	ID NO	CSLO 1. Analyze op-amps with negative feedback			CSLO 5. Analyze the operation of instrumentation and isolation amplifiers		
	Last	First			Summative	Formative		Summative	Formative	
			T2	Q2	L3	T3	Q3	L6		
1	XXXX	XXXX		XXXX	76.9	100	95	80.6	100	100
2	XXXX	XXXX		XXXX	89.7	100	100	88.9	100	100
3	XXXX	XXXX		XXXX	53.8	100	90	77.6	95.5	90
4	XXXX	XXXX		XXXX	84.6	97.1	100	100	81.8	100
5	XXXX	XXXX		XXXX	87.2	100	100	83.3	100	92
6	XXXX	XXXX		XXXX	64.1	88.2	100	88.9	90.9	0
7	XXXX	XXXX		XXXX	79.5	100	100	91.7	100	100
8	XXXX	XXXX		XXXX	61.5	79.4	95	88.9	90.9	85
9	XXXX	XXXX		XXXX	76.9	100	95	86.1	95.5	100
10	XXXX	XXXX		XXXX	61.5	100	90	88.9	90.9	90
11	XXXX	XXXX		XXXX	0	0	100	0	0	0
12	XXXX	XXXX		XXXX	84.6	94.1	100	77.8	90.9	92
13	XXXX	XXXX		XXXX	94.9	100	100	97.2	100	100
14	XXXX	XXXX		XXXX	71.8	100	100	94.4	100	92
15	XXXX	XXXX		XXXX	66.7	97.1	100	88.9	95.5	90
16	XXXX	XXXX		XXXX	76.9	100	100	91.7	100	92

*70% of the students will score 70% or higher

Benchmark	70	70	70	70	70	70
Actual Percentage	62.5	93.8	100	93.8	93.8	87.5
Benchmark Achieved?	Not Met	Exceed	Exceed	Exceed	Exceed	Exceed

Count of Students	Student Identification				FDTC Electronics Engineering Technology Degree Program Outcome 5					
					Digital Circuits - EET 145					
	Name		Sex	ID NO	CSLO 2. Use Boolean algebra to simplify complex logic circuits			CSLO 4. Effectively utilize counters in digital circuits		
	Last	First			Summative	Formative		Summative	Formative	
				Test 2	Quiz 3	Lab 4	Test 3	Quiz 5	Lab 6	
1	XXXX	XXXX		XXXX	70	100	100	85.3	100	100
2	XXXX	XXXX		XXXX	90	100	95	79.4	100	100
3	XXXX	XXXX		XXXX	95	95	100	94.1	95	100
4	XXXX	XXXX		XXXX	90	90	80	55.9	35	100
5	XXXX	XXXX		XXXX	47.5	0	85	0	0	0
6	XXXX	XXXX		XXXX	90	90	85	79.4	70	100
7	XXXX	XXXX		XXXX	72.5	100	80	85.3	85	0
8	XXXX	XXXX		XXXX	95	100	100	97.1	100	100
9	XXXX	XXXX		XXXX	80	0	95	64.7	0	92
10	XXXX	XXXX		XXXX	57.5	95	100	82.4	85	100
11	XXXX	XXXX		XXXX	60	80	100	50	100	100
12	XXXX	XXXX		XXXX	55	100	100	64.7	100	100
13	XXXX	XXXX		XXXX	85	100	100	58.8	80	100
14	XXXX	XXXX		XXXX	97.5	100	95	100	100	100
15	XXXX	XXXX		XXXX	80	100	100	79.4	100	100
16	XXXX	XXXX		XXXX	90	100	100	94.1	100	100

*70% of the students will score 70% or higher

Benchmark	70	70	70	70	70	70
Actual Percentage	75	87.5	100	62.5	81.3	87.5
Benchmark Achieved?	Exceed	Exceed	Exceed	Not Met	Exceed	Exceed

Florence-Darlington Technical College
Electronics Engineering Technology –
Program Assessment-Systematic Evaluation Plan

Course Category: Traditional Hybrid/Blended Online Web Facilitated Dual Enrollment DL

Program Student Learning Outcome:

PSLO 4: Demonstrate the power flow of simple electronic circuits.

Course Number	Course Student Learning Outcome	Assessment Method	Benchmark	Actual Level of Achievement	Action Plan	Time Interval
EET 220 Fall 2016	CSLO 1: Students will analyze operational amplifiers with negative feedback	Formative: Class will complete assigned chapter exercises and online quizzes related to this concept.	70% of students will score 70% or better on assessment	Quiz – 93.8% (Exceeded) Lab – 100% (Exceeded)	No formal action plan required. Review negative feedback prior to major test.	Week 3 to week 7
EET 220 Fall 2016	CSLO 1: Students will analyze operational amplifiers with negative feedback	Summative: midterm evaluation – Test 2	70% of the students will achieve a grade of 70 or better on assessment	Test – 62.5% (Not Met)	Group projects	Mid October.
EET 220 Fall 2016	CSLO 5: Students will describe and analyze the operation of instrumentation and isolation amplifiers	Formative: Class will complete assigned chapter exercises and online quizzes related to this concept.	70% of students will achieve 70% or better	Quiz – 93.8% (Exceeded) Lab – 87.5% (Exceeded)	Review the operation of instrumentation and isolation amplifiers prior to major test.	Week 10 to week 13
EET 220 Fall 2016	CSLO 5: Students will describe and analyze the operation of instrumentation and isolation amplifiers	Summative: Test #3	70% of the students will achieve a grade of 70 or better	Test – 93.8% (Exceeded)	Review the operation of instrumentation and isolation amplifiers with students having difficulty	Late November

**Florence-Darlington Technical College
Electronics Engineering Technology –
Program Assessment-Systematic Evaluation Plan**

Course Category: Traditional Hybrid/Blended Online Web Facilitated Dual Enrollment DL

Program Student Learning Outcome:

PSLO 5: Demonstrate the design, construction, and operation of simple digital logic circuits.

Course Number	Course Student Learning Outcome	Assessment Method	Benchmark	Actual Level of Achievement	Action Plan	Time Interval
EET 145	CSLO2: Students will use Boolean algebra to simplify complex logic circuits	Formative: Class will complete assigned quiz and Lab related to this concept.	70% of students will score 70% or better on quiz and Lab assessments.	Quiz – 87.5% of students exceeded the benchmark. Two students did not take the quiz causing the lower value. Lab – 100% Exceeded the benchmark.	No formal action plan required. However instructor will review Boolean algebra theories in more detail prior to major test.	Week 3 to week 7
EET 145	CSLO2: Students will use Boolean algebra to simplify complex logic circuits	Summative: Test on Boolean algebra	70% of the students will achieve a grade of 70 or better on assessment	Test – 75% of the students exceeded the benchmark. Four students scored below the benchmark on this test.	No formal action plan required. Instructor will review Boolean algebra theories prior to major test.	Mid October.
EET 145	CSLO4: Students will effectively utilize counters in digital circuits	Formative: Class will complete assigned quiz and Lab related to this concept.	70% of students will achieve 70% or better	Quiz – 81.3% and Lab – 87.5% students exceeded benchmark on both assessments with two students not participating.)	No formal action plan required. Instructor will review Boolean algebra theories prior to major test.	Week 10 to week 13
EET 145	CSLO4: Students will effectively utilize counters in digital circuits	Summative: Test on counters	70% of the students will achieve a grade of 70 or better	Test – 62.5% Benchmark was not met. Six students scored below the benchmark.	Introduce several group projects associated with Boolean algebra to give students practice prior to the test.	Late November

**Florence-Darlington Technical College
Assessment-Systematic Evaluation Plan Detailed Report**

Course Name: EET 220 – Analog Integrated Circuits [General and Technical Education]

Faculty: Mehdi Ansari-Lari

Semester(s) Reported: Fall 2016

Course Category: Traditional Hybrid/Blended Online Web Facilitated
 Dual Enrollment DL

Program Student Learning Outcome: PSLO4: Demonstrate the power flow of simple electronic circuits.

Course Student Learning Outcome: CSLO1: Analyze op-amps with negative feedback.

Analysis of Results: In the formative assessment the benchmark was exceeded however, the summative assessment test showed six students scored below the benchmark.

Strength in student performances: The students' comprehension on both the quiz and Lab exercise were good. The Lab grades averaged to approximately 97% and the quiz grades averaged to approximately 85%.

Weaknesses in student performances: The students' comprehension of op-amps with negative feedback was poor with only ten out of sixteen earned grade of 70 or better.

Recommended Action(s): Group exercise on op-amps with negative feedback prior to major test.

When Action will be implemented: FALL 2017

Data Comparison:

	2016 Spring- Startup	20__	20__	20__
Measurement Instrument	Benchmark	Benchmark	Benchmark	Benchmark
Summative: Midterm evaluation – Test 2	70% of the students will achieve a grade of 70 or better			
Formative: Exercises and online quizzes related to this concept.	70% of students will score 70% or better			

Impact of Changes Implemented As a Result of Previous Assessment Cycle:

**Florence-Darlington Technical College
Assessment-Systematic Evaluation Plan Detailed Report**

Course Name: EET 220 – Analog Integrated Circuits [General and Technical Education]

Faculty: Mehdi Ansari-Lari

Semester(s) Reported: Fall 2016

Course Category: Traditional Hybrid/Blended Online Web Facilitated
 Dual Enrollment DL

Program Student Learning Outcome: PSLO4: Demonstrate the power flow of simple electronic circuits.

Course Student Learning Outcome: CSLO5: Analyze the operation of instrumentation and isolation amplifiers.

Analysis of Results: Students did very well on both the lab and quiz formative assessments at 87.5% and 93.8% respectively. On the quiz fourteen students scored above 90% with one student received a failing grade for missing the quiz. However, on the summative assessment test, fifteen out of sixteen students earned grade of 70 or better and the test grades averaged to approximately 83%.

Strength in student performances: Students seem to easily grasp the concepts used in the analysis of operation of instrumentation and isolation amplifiers through laboratory work. This was shown by the 92% of the students that scored above the benchmark.

Weaknesses in student performances: The only student weakness was two students not being present for the assessments.

Recommended Action(s): Instructor will review the operation of instrumentation and isolation amplifiers prior to major test.

When Action will be implemented: FALL 2017

Data Comparison:

	2016 Spring- Startup	20__	20__	20__
Measurement Instrument	Benchmark	Benchmark	Benchmark	Benchmark
Summative: Test #3	70% of students will achieve 70% or better			
Formative: Exercises and online quizzes related to this concept.	70% of students will achieve 70% or better			

Impact of Changes Implemented As a Result of Previous Assessment Cycle:

**Florence-Darlington Technical College
Assessment-Systematic Evaluation Plan Detailed Report**

Course Name: EET 145 – Digital Circuits [General and Technical Education]

Faculty: Mehdi Ansari-Lari

Semester(s) Reported: Fall 2016

Course Category: Traditional Hybrid/Blended Online Web Facilitated
 Dual Enrollment DL

Program Student Learning Outcome:

PSLO5: Demonstrate the design, construction, and operation of simple digital logic circuits.

Course Student Learning Outcome:

CSLO2: Use Boolean algebra to simplify complex logic circuits.

Analysis of Results: In both the formative assessments and the summative assessment the benchmark was exceeded. The grades on the quiz had two students not take the quiz. On the test seven students scored above 90%. However, four students received a failing grade on the test.

Strength in student performances: The Students did very well on both the quiz and the Lab exercise. The average Lab grades were approximately 95%.

Weaknesses in student performances: Boolean algebra is difficult concept for most students to master and more practice is needed.

Recommended Action(s): Instructor will review Boolean algebra theories prior to major test.

When Action will be implemented: Fall 2017

Data Comparison:

	2016 Spring- Startup	2017 Fall	20__	20__
Measurement Instrument	Benchmark	Benchmark	Benchmark	Benchmark
Summative Midterm test	70% of the students will achieve a grade of 70 or better on midterm assessment			
Formative complete assigned Labs and quizzes	70% of students will achieve 70% or better on Labs and quizzes			

Impact of Changes Implemented As a Result of Previous Assessment Cycle:

**Florence-Darlington Technical College
Assessment-Systematic Evaluation Plan Detailed Report**

Course Name: EET 145 – Digital Circuits [General and Technical Education]

Faculty: Mehdi Ansari-Lari

Semester(s) Reported: Fall 2016

Course Category: Traditional Hybrid/Blended Online Web Facilitated
 Dual Enrollment DL

Program Student Learning Outcome: PSLO5: Demonstrate the design, construction, and operation of simple digital logic circuits.

Course Student Learning Outcome: CSLO4: Effectively utilize counters in digital circuits.

Analysis of Results: The formative assessments exceeded the benchmark by at least 11%. However, the summative assessment fell below the benchmark by 7.5%. Two students who missed the benchmark by 6 point had made the benchmark score the report on this assessment would have been in the exceeded category.

Strength in student performances: Students do well with hands-on Labs (88%) and scored good on the quiz (81%).

Weaknesses in student performances: 25% of the students failed the test related to counters. This indicates the need for more practice on counter during this section of the course.

Recommended Action(s):

The Instructors will institute several group exercises on counters prior to major test.

When Action will be implemented: FALL 2017

Data Comparison:

	2016 Spring- Startup	2017 Fall	20__	20__
Measurement Instrument	Benchmark	Benchmark	Benchmark	Benchmark
Summative Test on counters	70% of the students will achieve a grade of 70 or better			
Formative Lab exercises and quiz.	70% of students will achieve 70% or better			

Impact of Changes Implemented As a Result of Previous Assessment Cycle: