



**Jefferson College
1000 Viking Drive
Hillsboro, Missouri 63050**

Key personnel information contact sheet

(Grant Lead and Program Coordinator/s names, email addresses, work phone numbers)

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Chris DeGeare, Grant Co-Lead
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Bill Sansagraw, Coordinator/Faculty
Electronics Technology Certificate Program
bsansagr@jeffco.edu
636-481-3540

Introductory overview of program

(To provide your SME with a preliminary orientation to your program, this one- or two-page overview should *briefly* describe:)

Electronics Technology Certificate Program

PROGRAM SPECIFICS:

CIP Code: 47.0105

Credits associated with ETC: 30

Certificate: Electronics Technology Certificate

Industry Certifications:

DC Basics Certification

AC Basics Certification

Analog Basics Certification

Delivery Methods: Face-to-Face, Online, Hybrid

Students enrolled in the Electronics Technology Certificate Program will gain first-hand experience of the basic concepts of electricity and electronic control. This program will help prepare students for the Electronics Technicians Association (ETA) DC Basics Certification, AC Basics Certification, and Analog Basics Certification. Graduates of this program can expect to find employment as electrical technicians, ie., technicians who install, troubleshoot, repair, service, and maintain electrical control systems in manufacturing and service industries.

After completion of the Electronics Technology Certificate Program, students will have the opportunity to pursue an Associate of Applied Science in Electronics Technology Degree. With this opportunity, students will build on their electrical skills in automation programming and industrial robotics control. After completing the program, students will be ready to apply these skills in the workplace in a variety of potential careers.

- **ETC development and/or enhancement evolution:**

The ETC program at Jefferson College originally was designed as a face-to-face format, after determining that students entering the Electronics Program had been unable to attain credentials between initiation of studies and the AAS Degree. This in turn limited the students' ability to attain gainful employment during progress to the AAS completion. It was determined that a ladder approach would work best to meet the needs of students through MoSTEMWINS. Additionally, the course sequence and daytime offerings did not allow those seeking the skills to attend class, thus we needed to redesign it into a hybrid format, and meet once a week. We offered two sections of each course, so we could meet the students' needs for day or night. With these changes, we have met the needs of approximately 20-30 students. As this program is still in progress a definite count has yet to be made.

- **Challenges encountered in developing or launching it** (change of focus resulting from post-award industry partner discussions, recruitment issues, changes in regional job market demand, difficulty finding qualified instructors, etc.):

The greatest challenge that we've faced with the ETC program is finding and keeping qualified instructors to teach the courses. Business and industry also has great need for qualified professionals in the Electronics Industry, with the aforementioned certifications. Thus they can offer higher salaries and competitive benefits, luring potential instructors away from education. Adjunct instructors are equally difficult to find.

- **Information on current status of and plans for the program;**

Due to recent budget cuts from the Missouri Governor's office, the college has been forced to suspend programs with growth challenges. The ETC Program falls within such guidelines, and therefore plans for continuation have been cut, as have salaries associated with this program's faculty.

- **Any other pertinent information** that would help orient the SME to your program prior to document review.

N/A

Curriculum Map

For multi-course programs, provide a crosswalk between program or student learning outcomes and courses indicating where outcomes are introduced, reinforced and mastered. For single-course programs, provide a crosswalk between course objectives and units. *See different templates and examples for a multi-course program and a single-course program.*

See following document.

Program Career Ladder or Stackable Credential Information

Descriptive or graphic depiction of how students in your program can move up a career ladder through the acquisition of skills and certifications. *See MCC Manufacturing Careers and Career Map examples (MoMan Career Map, MCC.pdf)*

See ETC Job Tree

Syllabus

A syllabus (for each course in the program) that includes course objectives, prerequisites, course length (# of days or weeks), class/course hours and delivery method/s.

See JC/ETC Syllabi

Instructional Materials

List of all textbooks, manuals, websites, ancillary materials and major laboratory tools and equipment. *See template and example.*

List attached.

Overview Table of Objectives, Modules, Learning Activities, Assessments

Complete a table for *each course developed or enhanced with grant funds*, capturing in sufficient detail sample learning activities and assessments that best showcase your curriculum. *See template and example.*

Attached documents.

Jefferson College ~ MostEMWINS Multi-Course Program Curriculum Map

Curriculum Map for: Electronics Technology Certificate Program

47.0105

Key: **I** Introduced **R** Reinforced **A** Assessed

Courses	ETC103 DC Circuits	ETC104 AC Circuits	BIT128 Customer Service	ETC182 Semicon- ductors	ETC266 Industrial Control	MHT 127 Hydra- ulics & Pneu- matics
Program Outcomes						
Demonstrate an understanding of OSHA regulations and safe work practices in the classroom/lab	I,A	R,A		R,A	R,A	R,A
Demonstrate correct procedures and use of electrical/mechanical equipment	I,A	I,R,A		I,R,A	I,R,A	I,R,A
Demonstrate an understanding of pneumatic/hydraulic equipment						I,R,A
Demonstrate appropriate oral, written and technical/electronic communication skills	I,A	I,A	I,R,A	I,A	I,A	I,A
Demonstrate skill using mathematical equations to solve technical problems	I,R,A	I,R,A		I,R,A	I,R,A	I,R,A
Demonstrate an understanding of basic electrical theory	I,A	I,A		I,A	I,A	
Demonstrate the ability to install electrical/mechanical components using schematics and prints	I,A	I,A		I,R,A	I,R,A	

Instructions: Add courses along horizontal row; add program or student learning outcomes in first column; indicate where each outcome is introduced (I), reinforced (R), mastered (M) and/or assessed (A).

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Electronics Technology Program

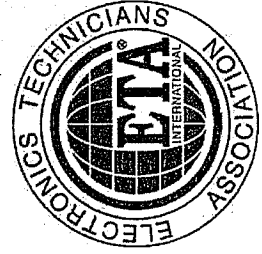
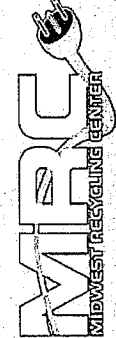
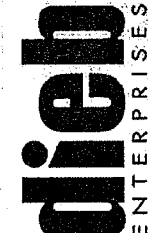
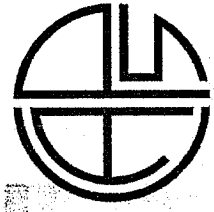
BS Degree Applied Management
Service Manager
Production Manager
Project Manager
Production Lead

AAS Degree Electronics Technology	
Industrial Electrician	Electronics Technician
Industrial Service Technician	Electrical Service Technician
Industrial Robotics Technician	Industrial Automation Technician
Field Service Technician	Electrical Equipment Installer
Electrical Engineering Technician	Plant Maintenance Technician

BS Degree Healthcare Management
Clinical Director
Facility Manager
Medical Device Sales Representative
Office Manager

AAS Degree Biomedical Electronics Technician	
Biomedical Equipment Technician	Biomedical Engineering Technician
Clinical Equipment Technician	Clinical Engineering Technician
Medical Equipment Repairer	Medical Equipment Field Service Technician

CTE Certificate Electronics Technology
Entry Level Electronics Technician
Equipment Installer
Service Technician
Electronics Equipment Installer
Maintenance Technician



It is the policy of Jefferson College that no person shall, on the basis of age, ancestry, color, creed, disability, genetic information, marital status, national origin, race, religion, sex, sexual orientation, or veteran status, be subject to discrimination in employment or in admission to any educational program or activity of the College. In compliance with Federal Rules and Regulations, Jefferson College has adopted a procedure for resolving complaints of discrimination. The procedure is available to any Jefferson College student, employee, or applicant who feels that he or she has been discriminated against in employment, student programs, or student activities. This Disability Support Services Office (DSS) of Jefferson College is committed to the fulfillment of equal educational opportunities, autonomy, and full inclusion for students with disabilities. Disability Support Services serves to determine and ensure appropriate accommodations for qualified students with documented disabilities, to assist students in self-advocacy and to ensure compliance with the ADA, ADAAG and Section 504 of the Rehabilitation Act. Students in need of accommodations can contact Disability Support Services at (636) 491-3198, dsupport@jeffco.edu.

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Jefferson College

Course Syllabus
BIT128
2 credit hours
Customer Service
Fall Semester 2016
CRN# 26158

Classroom: Online, 8 weeks

Time: ARR

Instructor Name: Bill Sansagraw

Office #: Technology Center, Room 301

Phone #: 636-481-3540

E-mail: bsansagr@jeffco.edu

Availability: Monday- 1:00-3:00p.m.; Tuesday- 3:00-4:00p.m.; Wednesday 9:00-11:00a.m.; Thursday 3:00-4:00; Friday 9:00-11:00a.m. (Office hours are posted on outside wall of my cubical.)

Textbook(s)/Supplies: Lucas, Robert W., Customer Service – Skills for Success, Sixth Edition, McGraw Hill-Irwin, 2015.

Prerequisite/Co-requisite: None

Due dates and deliverables: Due dates will be posted on Blackboard and are firm. Late or incomplete work will result in a significant grade reduction, if accepted.

Online discussion expectations: Because discussion is an integral part of the online classroom experience, participation is required. Discussion topics will be posted on the Blackboard discussion area on Sunday evening. Each week, you will be expected to make an original post in response to the prompt given in the discussion thread by 11:55pm Thursday. Further, you will be expected to respond to two of your peers by 11:55pm on Saturday.

Note: The discussion boards are set to “post first,” which means that each of you must make an original post before seeing the posts of others. This is to ensure that the ideas you post are your own. Once you post your original post it cannot be edited.

Here are qualities of a full-credit discussion forum post:

1. Substantial – Your original posts must be at least 100 words each; your responses to the posts of peers must be at least 50 words each.

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2. Concise – Your posts should be focused—do not ramble on and on and on. At the same time, however, be sure to meet the word minimums as given above.
3. Provocative – Ask thoughtful questions to facilitate discussion. Feel free to direct conversations in new, controversial directions. Give your classmates new ways to see/think about the material. It is fine to disagree and push one another beyond our comfort zones, as long as we do so respectfully. The purpose of this forum is to learn from one another—sometimes disagreeing helps us to do just that.
4. Interpretative – Expand on concepts you encountered in the readings. Connect ideas in new ways. Think outside your comfort zone.
5. Timely – Original posts should be posted by Thursday night at 11:55pm and responses to two of your peers by 11:55pm on Saturday
6. Grammatically Correct – Remove grammar and spelling errors from your original posts and comments before you post them. Such errors not only make a post difficult to read/understand, but will also affect your grade!

There are 8 weeks of discussion. Original posts will be graded out of 20 points. Responses to two of your peers will each be graded out of 5 points each. As such, each forum will be worth 30 points total.

Late work policy: Late assignments will only be permitted in cases of extreme hardship (e.g., unplanned change of employment, transfer, severe illness, accident, or death in the immediate family). It is the student's responsibility to inform the instructor prior to the due date of such circumstances and to provide acceptable documentation. If you fail to notify me immediately and provide adequate documentation, I will not accept late work.

Grading policy/scale: Approximately 985 points possible: include grades for homework, quizzes, tests, short and long papers. Grading scale: 100-90 A, 89.9-80 B, 79.9-70 C, 69.9-60 D, 59.9-below F. Grades are not rounded off to the nearest whole number.

Instructor Turnaround Time: Usually I will reply to an email or return a call within 24 hours (48 hours on weekends). If for some reason I am not able to reply within that timeframe, I will contact you through email at my earliest convenience. Typically, grades will be posted within seven days after the due date.

Please Note: All email communication must utilize the Jefferson College email system. Use of alternate email addresses is not permitted except in case of emergency. I will also use my Jefferson College email address.

Course Objectives:

Students will be able to define customer service skills necessary to satisfy the customer. Students will demonstrate knowledge and understanding of the importance of knowing your product or service. Students will understand the expectation of a quality product, reliable service, and reasonable prices.

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Course Outline:

Week 1

- Syllabus Quiz
- Week One Discussion Forums and Introduction Post
- Chapter 1 Review Questions: 1, 3, 5, 7, & 9

Week 2

- Week Two Discussion Forums
- Chapter 2 Review Questions: 2, 4, 6, 8, & 10

Week 3

- Week Three Discussion Forums
- Chapter 3 Review Questions: 1, 2, 3, 4, 5, & 6

Week 4

- Week Four Discussion Forums
- Chapter 4 Review Questions: 1, 3, 4, 6, 7, & 9
- Mid-Term Exam

Week 5

- Week Five Discussion Forums
- Chapter 5 Review Questions: 2, 4, 6, 8, & 10

Week 6

- Week Six Discussion Forums
- Chapter 7 Review Questions: 1, 2, 3, 4, 5, 6, 11, & 12

Week 7

- Week Seven Discussion Forums
- Chapter 8 Review Questions: 1, 3, 5, 7, & 9

Week 8

- Week Eight Discussion Forums
- Chapter 9 Review Questions: 1, 3, 5, 7, & 9
- Final Exam

Student Expectations/Evaluation:

- A. Complete syllabus quiz:** Must complete by Sunday, August 21st, 2016 (if you fail to complete this quiz, you will be removed from the course)
- B. Complete all discussion forum activities:** One original post and two peer responses
- C. Read All assigned chapters in the Customer Service textbook:** 1, 2, 3, 4, 5, 7, 8, & 9
- D. Complete all assigned review questions:** Complete the review questions located at the end of each chapter

Course Credit:

Total Points

25 points Syllabus Quiz	25
40 points per chapter review questions	320
200 points per final and mid-term exam	400
30 points Participation/Discussion forums	240

Total Points Possible: 985

Grading Scale:

- A= 90-100%
- B= 80-89.9%
- C= 70-79.9%
- D= 60-69.9%
- F= 0-59.9%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively

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participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.

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Jefferson College

Course Syllabus
ETC103
5 credit hours
DC Circuits
Spring Semester 2016
CRN# 36490

Classroom: TC 305, Hybrid, 8 weeks

Time: ARR

Instructor Name: Bill Sansagraw

Office #: Technology Center, Room 301

Phone #: 636-481-3540

E-mail: bsansagr@jeffco.edu

Availability: Monday, Tuesday & Friday 8:00-9:00 & 1:00-2:00; Wednesday 1:00-2:00; Thursday 3:00- 4:00
(Office hours are posted on outside wall of my cubical.)

Textbook(s)/Supplies: NIDA, DC circuits textbook/lab manual

Prerequisite/Co-requisite: None

Due dates and deliverables: Due dates will be posted on Blackboard and are firm. Late or incomplete work will result in a significant grade reduction, if accepted.

Online discussion expectations: Because discussion is an integral part of the hybrid classroom experience, participation is required. Discussion topics will be posted on the Blackboard discussion area on Sunday evening. Each week, you will be expected to make an original post in response to the prompt given in the discussion thread by 11:55pm Thursday. Further, you will be expected to respond to two of your peers by 11:55pm on Saturday.

Note: The discussion boards are set to "post first," which means that each of you must make an original post before seeing the posts of others. This is to ensure that the ideas you post are your own. Once you post your original post it cannot be edited.

Here are qualities of a full-credit discussion forum post:

1. Substantial – Your original posts must be at least 200 words each; your responses to the posts of peers must be at least 100 words each.

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2. Concise – Your posts should be focused—do not ramble on and on and on. At the same time, however, be sure to meet the word minimums as given above.
3. Provocative – Ask thoughtful questions to facilitate discussion. Feel free to direct conversations in new, controversial directions. Give your classmates new ways to see/think about the material. It is fine to disagree and push one another beyond our comfort zones, as long as we do so respectfully. The purpose of this forum is to learn from one another—sometimes disagreeing helps us to do just that.
4. Interpretative – Expand on concepts you encountered in the readings. Connect ideas in new ways. Think outside your comfort zone.
5. Timely – Original posts should be posted by Thursday night at 11:55pm and responses to two of your peers by 11:55pm on Saturday
6. Grammatically Correct – Remove grammar and spelling errors from your original posts and comments before you post them. Such errors not only make a post difficult to read/understand, but will also affect your grade!

There are 8 weeks of discussion. Original posts will be graded out of 20 points. Responses to two of your peers will each be graded out of 5 points each. As such, each forum will be worth 30 points total.

Late work policy: Late assignments will only be permitted in cases of extreme hardship (e.g., unplanned change of employment, transfer, severe illness, accident, or death in the immediate family). It is the student's responsibility to inform the instructor prior to the due date of such circumstances and to provide acceptable documentation. If you fail to notify me immediately and provide adequate documentation, I will not accept late work.

Grading policy/scale: Approximately 1,005 points possible: include grades for homework, quizzes, tests, short and long papers. Grading scale: 100-90 A, 90-80 B, 80-70 C, 70-60 D, 60-below F. Grades are not rounded off to the nearest whole number.

Instructor Turnaround Time: Usually I will reply to an email or return a call within 24 hours (48 hours on weekends). If for some reason I am not able to reply within that timeframe, I will contact you through email at my earliest convenience. Typically, grades will be posted within seven days after the due date.

Please Note: All email communication must utilize the Jefferson College email system. Use of alternate email addresses is not permitted except in case of emergency. I will also use my Jefferson College email address.

Course Objectives:

Students will be able to define direct current theory. Students will demonstrate knowledge and understanding of the concepts and laws related to the study of voltage, current, resistance, and power in direct current circuits. Students will construct circuits on the trainers to operate series, parallel, and complex series/parallel circuits. Students will identify common components used in direct current circuits.

“Instructor reserves the right to make changes to the syllabus at any time.”

Course Outline:

Week 1

- Syllabus Quiz
- Week One Discussion Forums and Introduction Post
- Block 1:
 - Lesson 1- Introduction and safety
 - Lesson 2- Training equipment familiarization
 - Lesson 3- Metric notation lesson

Week 2

- Week Two Discussion Forums
- Block 1:
 - Lesson 4- Voltage and current lesson
 - Lesson 5- Resistors
 - Lesson 6- Switches, fuses, and circuit breakers

Week 3

- Week Three Discussion Forums
- Block 2:
 - Lesson 1- Magnetism, relays and meters
 - Lesson 2- Meters and multimeters
 - Lesson 3- Voltage measurements

Week 4

- Week Four Discussion Forums
- Block 2:
 - Lesson 4- Current measurements
 - Lesson 5- Resistance measurements
- Block 3:
 - Lesson 1- Ohm's law and power
- Mid-Term Exam

Week 5

- Week Five Discussion Forums
- Block 3:
 - Lesson 2- Series circuits
 - Lesson 3- Series circuit troubleshooting
 - Lesson 4- Parallel circuits

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Week 6

- **Week Six Discussion Forums**
- **Block 3:**
 - Lesson 5- Parallel circuit troubleshooting
 - Lesson 6- Series-parallel circuits
 - Lesson 7- Series-parallel circuit troubleshooting

Week 7

- **Week Seven Discussion Forums**
- **Block 4:**
 - Lesson 1- Voltage dividers
 - Lesson 2- Kirchhoff's voltage and current laws
 - Lesson 3- Voltmeter loading effects

Week 8

- **Week Eight Discussion Forums**
- **Block 4:**
 - Lesson 4- Bridge circuits
 - Lesson 5- Norton's Theorem
 - Lesson 6- Thevenin's Theorem
- **Final Exam**

Student Expectations/Evaluation:

- A. Complete syllabus quiz:** Must complete by Sunday, January 17th, 2016 (if you fail to complete this quiz, you will be removed from the course)
- B. Complete all discussion forum activities:** One original post and two peer responses
- C. Read All lessons in the NIDA textbook/lab manual:** Block 1- lessons 1-6, Block 2- lessons 1-5, Block 3- lessons 1-7, and Block 4- lessons 1-6
- D. Complete all NIDA training software test:** Complete the test questions located at the end of each online NIDA lesson
- E. Students need to schedule a meeting with the instructor after first absence. Students having more than two absences will be withdrawn from this class**

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Course Credit:	Total Points
25 points Syllabus Quiz	25
20 points per NIDA training software test	340
200 points per final and mid-term exam	400
30 points Participation/Discussion forums	240

Total Points Possible: 1,005

Grading Scale:

- A= 90-100%
- B= 80-89.9%
- C= 70-79.9%
- D= 60-69.9%
- F= 0-59.9%

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Jefferson College

Course Syllabus
ETC104
5 credit hours
AC Circuits
Spring Semester 2016
CRN# 26156

Classroom: TC 305

Time: ARR, Hybrid, 8 weeks

Instructor Name: Bill Sansagraw

Office #: Technology Center, Room 301

Phone #: 636-481-3540

E-mail: bsansagr@jeffco.edu

Availability: Monday- 1:00-3:00p.m.; Tuesday- 3:00-4:00p.m.; Wednesday 9:00-11:00a.m.; Thursday 3:00-4:00; Friday 9:00-11:00a.m. (Office hours are posted on outside wall of my cubical.)

Textbook(s)/Supplies: NIDA, AC Circuits textbook/lab manual

Prerequisite/Co-requisite: None

Due dates and deliverables: Due dates will be posted on Blackboard and are firm. Late or incomplete work will result in a significant grade reduction, if accepted.

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1. Substantial – Your original posts must be at least 200 words each; your responses to the posts of peers must be at least 100 words each.

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2. Concise – Your posts should be focused—do not ramble on and on and on. At the same time, however, be sure to meet the word minimums as given above.
3. Provocative – Ask thoughtful questions to facilitate discussion. Feel free to direct conversations in new, controversial directions. Give your classmates new ways to see/think about the material. It is fine to disagree and push one another beyond our comfort zones, as long as we do so respectfully. The purpose of this forum is to learn from one another—sometimes disagreeing helps us to do just that.
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Grading policy/scale: Approximately 1,005 points possible: include grades for homework, quizzes, tests, short and long papers. Grading scale: 100-90 A, 90-80 B, 80-70 C, 70-60 D, 60-below F. Grades are not rounded off to the nearest whole number.

Instructor Turnaround Time: Usually I will reply to an email or return a call within 24 hours (48 hours on weekends). If for some reason I am not able to reply within that timeframe, I will contact you through email at my earliest convenience. Typically, grades will be posted within seven days after the due date.

Please Note: All email communication must utilize the Jefferson College email system. Use of alternate email addresses is not permitted except in case of emergency. I will also use my Jefferson College email address.

Course Objectives:

Students will be able to define alternating current theory. Students will demonstrate knowledge and understanding of the concepts and laws related to the study of voltage, current, impedance, and power in alternating current circuits. Students will construct circuits on the trainers to operate series, parallel, and complex series/parallel circuits. Students will identify common components used in alternating current circuits.

“Instructor reserves the right to make changes to the syllabus at any time.”

Course Outline:

Week 1

- Syllabus Quiz
- **Week One Discussion Forums and Introduction Post**
- **Block 1:**
 - Lesson 1- Alternating Current
 - Lesson 2- Generating AC Electricity
 - Lesson 3- Non-Sinusoidal Waves

Week 2

- **Week Two Discussion Forums**
- **Block 1:**
 - Lesson 4- Resistance in AC circuits
- **Oscilloscope Training**
- **Block 2:**
 - Lesson 3- Oscilloscope use with function generator

Week 3

- **Week Three Discussion Forums**
- **Block 2:**
 - Lesson 4- Function generator use
- **Block 3:**
 - Lesson 1- Introduction to inductors
 - Lesson 2- RL series circuits

Week 4

- **Week Four Discussion Forums**
- **Block 3:**
 - Lesson 3- RL parallel circuits
 - Lesson 5- RL filters
- **Block 4:**
 - Lesson 1- Capacitors
- **Mid-Term Exam**

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Week 5

- **Week Five Discussion Forums**

- **Block 4:**
 - Lesson 2- RC series circuits
 - Lesson 3- RC parallel circuits
 - Lesson 5- RC filters

Week 6

- **Week Six Discussion Forums**

- **Block 5:**
 - Lesson 1- RC time constants
 - Lesson 2- RC circuit transients

- **Block 6:**
 - Lesson 1- Series RCL Circuits

Week 7

- **Week Seven Discussion Forums**

- **Block 6:**
 - Lesson 2- Parallel RCL Circuits

- **Block 7:**
 - Lesson 1- Transformer Action
 - Lesson 2- Transformer troubleshooting

Week 8

- **Week Eight Discussion Forums**

- **Block 8:**
 - Lesson 1- Relays

- **Final Exam**

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Student Expectations/Evaluation:

- A. **Complete syllabus quiz:** Must complete by October 16th, 2016 (if you fail to complete this quiz, you will be removed from the course)
- B. **Complete all discussion forum activities:** One original post and two peer responses
- C. **Read All lessons in the NIDA textbook/lab manual:** Block 1- lessons 1-4, Block 2- lessons 2-4, Block 3- lessons 1-3 & 5, Block 4- lessons 1-3 & 5, Block 5- lessons 1&2, Block 6- lessons 1&2, Block 7- lessons 1 & 2, and Block 8- lesson 1
- D. **Complete all NIDA training software test:** Complete the test questions located at the end of each online NIDA lesson
- E. **Students need to schedule a meeting with the instructor after first absence. Students having more than two absences will be withdrawn from this class**

Course Credit:	Total Points
25 points Syllabus Quiz	25
20 points per NIDA training software test	340
200 points per final and mid-term exam	400
30 points Participation/Discussion forums	240

Total Points Possible: 1,005

Grading Scale:

A= 90-100%

B= 80-89.9%

C= 70-79.9%

D= 60-69.9%

F= 0-59.9%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

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XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.

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Jefferson College

Course Syllabus
ETC132
5 credit hours
Semiconductors
Spring 2017
CRN# 36957

Classroom: TC 305

Time: Tuesday 11:00am to 3:00pm, Hybrid, 8 weeks

Instructor Name: Bill Sansagraw

Office #: Technology Center, Room 301

Phone #: 636-481-3540

E-mail: bsansagr@jeffco.edu

Availability: Monday- 9:00-11:00a.m.; Tuesday- 3:00-4:00p.m.; Wednesday 4:00-6:00p.m. (**Online Only**); Thursday 11:00-12:00p.m. and 2:00-4:00p.m.; Friday 9:00-11:00a.m. (Office hours are posted on outside wall of my cubical.)

Textbook(s)/Supplies: NIDA, Analog Circuits textbook/lab manual

Prerequisite/Co-requisite: ETC104 AC Circuits

Due dates and deliverables: Due dates will be posted on Blackboard and are firm. Late or incomplete work will result in a significant grade reduction, if accepted.

Online discussion expectations: Because discussion is an integral part of the hybrid classroom experience, participation is required. Discussion topics will be posted on the Blackboard discussion area on Sunday evening. Each week, you will be expected to make an original post in response to the prompt given in the discussion thread by 11:55pm Thursday. Further, you will be expected to respond to two of your peers by 11:55pm on Saturday.

Note: The discussion boards are set to "post first," which means that each of you must make an original post before seeing the posts of others. This is to ensure that the ideas you post are your own. Once you post your original post it cannot be edited.

Here are qualities of a full-credit discussion forum post:

1. Substantial – Your original posts must be at least 150 words each; your responses to the posts of peers must be at least 75 words each.

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2. Concise – Your posts should be focused—do not ramble on and on and on. At the same time, however, be sure to meet the word minimums as given above.
3. Provocative – Ask thoughtful questions to facilitate discussion. Feel free to direct conversations in new, controversial directions. Give your classmates new ways to see/think about the material. It is fine to disagree and push one another beyond our comfort zones, as long as we do so respectfully. The purpose of this forum is to learn from one another—sometimes disagreeing helps us to do just that.
4. Interpretative – Expand on concepts you encountered in the readings. Connect ideas in new ways. Think outside your comfort zone.
5. Timely – Original posts should be posted by Thursday night at 11:55pm and responses to two of your peers by 11:55pm on Saturday
6. Grammatically Correct – Remove grammar and spelling errors from your original posts and comments before you post them. Such errors not only make a post difficult to read/understand, but will also affect your grade!

There are 8 weeks of discussion. Original posts will be graded out of 20 points. Responses to two of your peers will each be graded out of 5 points each. As such, each forum will be worth 30 points total.

Late work policy: Late assignments will only be permitted in cases of extreme hardship (e.g., unplanned change of employment, transfer, severe illness, accident, or death in the immediate family). It is the student's responsibility to inform the instructor prior to the due date of such circumstances and to provide acceptable documentation. If you fail to notify me immediately and provide adequate documentation, I will not accept late work.

Grading policy/scale: Approximately 1,245 points possible: include grades for homework, quizzes, tests, short and long papers. Grading scale: 100-90 A, 90-80 B, 80-70 C, 70-60 D, 60-below F. Grades are not rounded off to the nearest whole number.

Instructor Turnaround Time: Usually I will reply to an email or return a call within 24 hours (48 hours on weekends). If for some reason I am not able to reply within that timeframe, I will contact you through email at my earliest convenience. Typically, grades will be posted within seven days after the due date.

Please Note: All email communication must utilize the Jefferson College email system. Use of alternate email addresses is not permitted except in case of emergency. I will also use my Jefferson College email address.

Course Objectives:

Students will be able to define and demonstrate knowledge and understanding of basic semiconductor physics, diode applications, bipolar transistors, transistor biasing techniques, transistor amplifiers, field transistors, FET biasing techniques, FET amplifiers, and frequency analysis.

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Course Outline:

Week 1

- Syllabus Quiz
- Week One Discussion Forums and Introduction Post
- Block 1:
 - Lesson 1- Introduction to Diodes
 - Lesson 2- Diode Limiter Operation
 - Lesson 4- Diodes Clampers
 - NIDA online- Junction Diodes

Week 2

- Week Two Discussion Forums
- Block 2:
 - Lesson 1- Introduction to Transistors
 - Lesson 2- Common Emitter Amplifier
 - Lesson 3- Common Collector Amplifier
 - Lesson 4- Common Base Amplifier

Week 3

- Week Three Discussion Forums
- Block 3:
 - Lesson 1- Full and Half Wave Rectifier Operation
 - Lesson 2- Bridge Rectifier Operation
 - Lesson 3- Zener Diode Action
 - NIDA online- Introduction to Power Supplies and Diode Rectifiers
 - NIDA online- Introduction to Voltage Regulators

Week 4

- Week Four Discussion Forums
- Block 3:
 - Lesson 4- Zener Diode Regulators
- Block 4:
 - Lesson 3- FET amplifiers
 - Lesson 5- Push-Pull Amplifiers
 - NIDA online- (MOSFET) Metal-Oxide Semiconductor Field Effect Transistor
- Mid-Term Exam

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Week 5

- **Week Five Discussion Forums**
- **Block 5:**
 - Lesson 1- Hartley Oscillator
 - Lesson 2- Colpitts Oscillator
 - NIDA online- Introduction to Sine wave Oscillators
 - NIDA online- Crystal Controlled Oscillator

Week 6

- **Week Six Discussion Forums**
- **Block 6:**
 - Lesson 1- Astable Multivibrator
 - Lesson 2- Bistable Multivibrator
 - Lesson 3- Monostable Multivibrator
 - NIDA online- Introduction to Multivibrator Circuits

Week 7

- **Week Seven Discussion Forums**
- **Block 7:**
 - Lesson 1- Unijunction Transistor Oscillator
 - Lesson 2- SCR Action
 - Lesson 4- SCR power Control Circuits
 - NIDA online- Introduction to Trigger Devices

Week 8

- **Week Eight Discussion Forums**
- **Final Exam**

Student Expectations/Evaluation:

- A. Complete syllabus quiz:** Must complete by Sunday, January 15th, 2017 (if you fail to complete this quiz, you will be removed from the course)
- B. Complete all discussion forum activities:** One original post and two peer responses
- C. Read All assigned lessons in the NIDA textbook/lab manual:** See week 1 through 8 above
- D. Complete all NIDA training software test:** Complete the test questions located at the end of each online NIDA lesson
- E. Students need to schedule a meeting with the instructor after first absence. Students having more than two absences will be withdrawn from this class**

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Course Credit:	Total Points
25 points Syllabus Quiz	25
20 points per NIDA training software test	580
200 points per final and mid-term exam	400
30 points Participation/Discussion forums	240

Total Points Possible: 1,245

Grading Scale:

A= 90-100%

B= 80-89.9%

C= 70-79.9%

D= 60-69.9%

F= 0-59.9%

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Jefferson College

Course Syllabus
ETI236
4 credit hours
Industrial Control
Spring 2017
CRN# 36959

Classroom: TC 305

Time: Tuesday 11:00am to 3:00pm, Hybrid, 8 weeks

Instructor Name: Bill Sansagraw

Office #: Technology Center, Room 301

Phone #: 636-481-3540

E-mail: bsansagr@jeffco.edu

Availability: Monday- 9:00-11:00a.m.; Tuesday- 3:00-4:00p.m.; Wednesday 4:00-6:00p.m. (**Online Only**); Thursday 11:00-12:00p.m. and 2:00-4:00p.m.; Friday 9:00-11:00a.m. (Office hours are posted on outside wall of my cubical.)

Textbook(s): Rockis and Mazur, Electrical Motor Controls, Current Edition, American Technical Publishers

Supplies: Paper, notebooks, pens, pencils with erasers, colored pencils and flash drive

Prerequisite/Co-requisite: ETC104 with a grade of "C" or better or instructor permission, and reading proficiency

Due dates and deliverables: Due dates will be posted on Blackboard and are firm. Late or incomplete work will result in a significant grade reduction, if accepted.

Online discussion expectations: Because discussion is an integral part of the hybrid classroom experience, participation is required. Discussion topics will be posted on the Blackboard discussion area on Sunday evening. Each week, you will be expected to make an original post in response to the prompt given in the discussion thread by 11:55pm Thursday. Further, you will be expected to respond to two of your peers by 11:55pm on Saturday.

Note: The discussion boards are set to "post first," which means that each of you must make an original post before seeing the posts of others. This is to ensure that the ideas you post are your own. Once you post your original post it cannot be edited.

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1. Substantial – Your original posts must be at least 150 words each; your responses to the posts of peers must be at least 75 words each.

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2. Concise – Your posts should be focused—do not ramble on and on and on. At the same time, however, be sure to meet the word minimums as given above.
3. Provocative – Ask thoughtful questions to facilitate discussion. Feel free to direct conversations in new, controversial directions. Give your classmates new ways to see/think about the material. It is fine to disagree and push one another beyond our comfort zones, as long as we do so respectfully. The purpose of this forum is to learn from one another—sometimes disagreeing helps us to do just that.
4. Interpretative – Expand on concepts you encountered in the readings. Connect ideas in new ways. Think outside your comfort zone.
5. Timely – Original posts should be posted by Thursday night at 11:55pm and responses to two of your peers by 11:55pm on Saturday
6. Grammatically Correct – Remove grammar and spelling errors from your original posts and comments before you post them. Such errors not only make a post difficult to read/understand, but will also affect your grade!

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Grading policy/scale: Approximately 1,265 points possible: include grades for homework, quizzes, tests, short and long papers. Grading scale: 100-90 A, 90-80 B, 80-70 C, 70-60 D, 60-below F. Grades are not rounded off to the nearest whole number.

Instructor Turnaround Time: Usually I will reply to an email or return a call within 24 hours (48 hours on weekends). If for some reason I am not able to reply within that timeframe, I will contact you through email at my earliest convenience. Typically, grades will be posted within seven days after the due date.

Please Note: All email communication must utilize the Jefferson College email system. Use of alternate email addresses is not permitted except in case of emergency. I will also use my Jefferson College email address.

Course Objectives:

Students will cover industrial control which involves a study of AC and DC motor theory as well as control devices and symbols, ladder diagrams, common motor control circuits, sensors and transducers, open and closed-loop process control, and synchro components.

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Course Outline:

Week 1

- Syllabus Quiz

- Week One Discussion Forums and Introduction Post

- Chapter 4- Electrical Safety:
 - CHECK POINT 4-1
 - CHECK POINT 4-2
 - CHECK POINT 4-3
 - CHECK POINT 4-4
 - CHECK POINT 4-5
 - CHECK POINT 4-6

- Chapter 2- Symbols and Diagrams:
 - CHECK POINT 2-1
 - CHECK POINT 2-2

Week 2

- Week Two Discussion Forums

- Chapter 5- Control Logic:
 - CHECK POINT 5-1
 - CHECK POINT 5-2
 - CHECK POINT 5-3
 - CHECK POINT 5-4
 - CHECK POINT 5-5

- Chapter 6- Mechanical Input Control Device:
 - CHECK POINT 6-1
 - CHECK POINT 6-2
 - CHECK POINT 6-3
 - CHECK POINT 6-4
 - CHECK POINT 6-5
 - CHECK POINT 6-6
 - CHECK POINT 6-7
 - CHECK POINT 6-8
 - CHECK POINT 6-9
 - CHECK POINT 6-10

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Week 3

- **Week Three Discussion Forums**

- **Chapter 7- Solenoids:**
 - CHECK POINT 7-1
 - CHECK POINT 7-2
 - CHECK POINT 7-3
 - CHECK POINT 7-4
 - CHECK POINT 7-5

- **Chapter 8- Electromechanical Relays:**
 - CHECK POINT 8-1
 - CHECK POINT 8-2
 - CHECK POINT 8-3

Week 4

- **Week Four Discussion Forums**

- **Chapter 11- Transformers:**
 - CHECK POINT 11-1
 - CHECK POINT 11-2
 - CHECK POINT 11-3
 - CHECK POINT 11-4

- **Mid-Term Exam**

Week 5

- **Week Five Discussion Forums**

- **Chapter 12- Contactors and Magnetic Motor Starters:**
 - CHECK POINT 12-1
 - CHECK POINT 12-2
 - CHECK POINT 12-3
 - CHECK POINT 12-4
 - CHECK POINT 12-5
 - CHECK POINT 12-6
 - CHECK POINT 12-7

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- **Chapter 13- DC Motors:**
 - CHECK POINT 13-1
 - CHECK POINT 13-2
 - CHECK POINT 13-3
 - CHECK POINT 13-4
 - CHECK POINT 13-5
 - CHECK POINT 13-6

Week 6

- **Week Six Discussion Forums**

- **Chapter 14- AC Motors:**
 - CHECK POINT 14-1
 - CHECK POINT 14-2
 - CHECK POINT 14-3

- **Chapter 15- Reversing Motors:**
 - CHECK POINT 15-1
 - CHECK POINT 15-2
 - CHECK POINT 15-3
 - CHECK POINT 15-4
 - CHECK POINT 15-5
 - CHECK POINT 15-6

Week 7

- **Week Seven Discussion Forums**

- **Chapter 16- Timing and Counting Functions:**
 - CHECK POINT 16-1
 - CHECK POINT 16-2
 - CHECK POINT 16-3
 - CHECK POINT 16-4
 - CHECK POINT 16-5

- **Chapter 22- Semiconductor Amplification and Switching:**
 - CHECK POINT 22-1
 - CHECK POINT 22-2
 - CHECK POINT 22-3
 - CHECK POINT 22-4

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Week 8

- **Week Eight Discussion Forums**

- **Chapter 26- Motor Drives:**
 - CHECK POINT 26-1
 - CHECK POINT 26-2
 - CHECK POINT 26-3
 - CHECK POINT 26-4
 - CHECK POINT 26-5

- **Final Exam**

Student Expectations/Evaluation:

- A. Complete syllabus quiz:** Must complete by Sunday, March 19th, 2017 (if you fail to complete this quiz, you will be removed from the course)

- B. Complete all discussion forum activities:** One original post and two peer responses

- C. Read All Assigned Chapters:** 2,4,5,6,7,8,11,12,13,14,15,16, 22 and 26

- D. Perform All CHECK POINT review questions:** Complete the review questions located in the Electrical Motor Control textbook.

- E. Participate in hands-on exercises individually and in a group setting.**

- F. Complete all class exams by their assigned due date. An extension will not be granted on exams.**

- G. Students need to schedule a meeting with the instructor after first absence. Students having more than second absences will be withdrawal from this class.**

Course Credit:	Total Points
25 points Syllabus Quiz	25
43 points per check point review questions	600
200 points per exam	400
30 points Participation/Discussion forums	240
Total Points Possible	1,265

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Grading Scale:

A= 90-100%

B= 80-89.9%

C= 70-79.9%

D= 60-69.9%

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Jefferson College

Course Syllabus
MTT147
2 credit hours
Hydraulics & Pneumatics I
Spring Semester 2016
CRN# 36494

Classroom: TC 312

Time: ARR, Hybrid, 8 weeks

Instructor Name: Bill Sansagraw

Office #: Technology Center, Room 301

Phone #: 636-481-3540

E-mail: bsansagr@jeffco.edu

Availability: Monday, Tuesday & Friday 8:00-9:00 & 1:00-2:00; Wednesday 1:00-2:00; Thursday 3:00- 4:00
(Office hours are posted on outside wall of my cubical.)

Textbook(s)/Supplies: Amatrol Basic Hydraulics Student Laps and Amatrol Basic Pneumatics Student Laps

Prerequisite/Co-requisite: None

Due dates and deliverables: Due dates will be posted on Blackboard and are firm. Late or incomplete work will result in a significant grade reduction, if accepted.

Online discussion expectations: Because discussion is an integral part of the hybrid classroom experience, participation is required. Discussion topics will be posted on the Blackboard discussion area on Sunday evening. Each week, you will be expected to make an original post in response to the prompt given in the discussion thread by 11:55pm Thursday. Further, you will be expected to respond to two of your peers by 11:55pm on Saturday.

Note: The discussion boards are set to "post first," which means that each of you must make an original post before seeing the posts of others. This is to ensure that the ideas you post are your own. Once you post your original post it cannot be edited.

Here are qualities of a full-credit discussion forum post:

1. Substantial – Your original posts must be at least 200 words each; your responses to the posts of peers must be at least 100 words each.

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3. Provocative – Ask thoughtful questions to facilitate discussion. Feel free to direct conversations in new, controversial directions. Give your classmates new ways to see/think about the material. It is fine to disagree and push one another beyond our comfort zones, as long as we do so respectfully. The purpose of this forum is to learn from one another—sometimes disagreeing helps us to do just that.
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6. Grammatically Correct – Remove grammar and spelling errors from your original posts and comments before you post them. Such errors not only make a post difficult to read/understand, but will also affect your grade!

There are 8 weeks of discussion. Original posts will be graded out of 20 points. Responses to two of your peers will each be graded out of 5 points each. As such, each forum will be worth 30 points total.

Late work policy: Late assignments will only be permitted in cases of extreme hardship (e.g., unplanned change of employment, transfer, severe illness, accident, or death in the immediate family). It is the student's responsibility to inform the instructor prior to the due date of such circumstances and to provide acceptable documentation. If you fail to notify me immediately and provide adequate documentation, I will not accept late work.

Grading policy/scale: Approximately 1,115 points possible: include grades for homework, quizzes, tests, short and long papers. Grading scale: 100-90 A, 90-80 B, 80-70 C, 70-60 D, 60-below F. Grades are not rounded off to the nearest whole number.

Instructor Turnaround Time: Usually I will reply to an email or return a call within 24 hours (48 hours on weekends). If for some reason I am not able to reply within that timeframe, I will contact you through email at my earliest convenience. Typically, grades will be posted within seven days after the due date.

Please Note: All email communication must utilize the Jefferson College email system. Use of alternate email addresses is not permitted except in case of emergency. I will also use my Jefferson College email address.

Course Objectives:

Students will be able to define pneumatics/ hydraulics and give an application of each. Students will demonstrate the ability to read gauges and adjust fluid power for pneumatics and hydraulics. Students will construct circuits on the trainers to operate different components of pneumatic and hydraulic systems. Students will design a schematic of pneumatic/ hydraulic systems and then build them. Students will illustrate the needed preventive maintenance on pneumatic and hydraulic systems.

“Instructor reserves the right to make changes to the syllabus at any time.”

Course Outline:

Week 1

- Syllabus Quiz
- **Week One Discussion Forums and Introduction Post**
- **Basic Pneumatic Systems:**
 - Read LAP 1- Pneumatic Power Systems
 - LAP 1- Pneumatic Power Systems Self-Review Question
 - LAP 1- Skills Exercise in lab

Week 2

- **Week Two Discussion Forums**
- **Basic Pneumatic Systems:**
 - Read LAP 2- Basic Pneumatic Circuits
 - LAP 2- Basic Pneumatic Circuits Self-Review Question
 - LAP 2- Skills Exercise

Week 3

- **Week Three Discussion Forums**
- **Basic Pneumatic Systems:**
 - Read LAP 3- Principles of Pneumatic Pressure
 - LAP 3- Principles of Pneumatic Pressure and Flow Self-Review Question
 - LAP 3- Skills Exercise

Week 4

- **Week Four Discussion Forums**
- **Basic Pneumatic Systems:**
 - Read LAP 4- Pneumatic Speed Control Circuits
 - LAP 4- Pneumatic Speed Control Circuits Self-Review Question
 - LAP 4- Skills Exercise
- **Mid-Term Exam**

Week 5

- **Week Five Discussion Forums**
- **Basic Hydraulic Systems:**
 - Read LAP 1- Hydraulic Power Systems
 - LAP 1- Hydraulic Power Systems Self-Review Question
 - LAP 1- Skills Exercise
- **Basic Hydraulic Systems:**
 - Read LAP 2- Basic Hydraulic Circuits

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- LAP 2- Basic Hydraulic Circuits Self-Review Question
- LAP 2- Skills Exercise

Week 6

- **Week Six Discussion Forums**
- **Basic Hydraulic Systems:**
 - Read LAP 3- Principles of Hydraulic Pressure
 - LAP 3- Principles of Hydraulic Pressure and Flow Self-Review Question
 - LAP 3- Skills Exercise

Week 7

- **Week Seven Discussion Forums**
- **Basic Hydraulic Systems:**
 - Read LAP 4- Hydraulic Speed Control
 - LAP 4- Hydraulic Speed Control Self-Review Question
 - LAP 4- Skills Exercise

Week 8

- **Week Eight Discussion Forums**
- **Basic Hydraulic Systems:**
 - Read LAP 5- Pressure Control Circuits
 - LAP 5- Pressure Control Circuits Self-Review Question
 - LAP 5- Skills Exercise
- **Intermediate Hydraulic Systems:**
 - Read LAP 5- Accumulator Applications
 - LAP 5- Accumulator Applications Self-Review Question
 - LAP 5- Skills Exercise
- **Final Exam**

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Student Expectations/Evaluation:

- A. **Complete syllabus quiz:** Must complete by Sunday, March 13th, 2016 (if you fail to complete this quiz, you will be removed from the course)
- B. **Complete all discussion forum activities:** One original post and two peer responses
- C. **Read All Learning Activity Packages(LAPS):** Basic Pneumatic laps 1-4, Basic Hydraulic laps 1-5, and Intermediate Hydraulics lap 5
- D. **Perform All LAP self review questions:** Complete the self review questions located at the end of each segment
- E. **Perform All Learning Activity Package Skill Exercises:** The skill exercises must be performed in the Lab to demonstrate proficiency on the LAPs
- F. **Students need to schedule a meeting with the instructor after first absence. Students having more than two absences will be withdrawal from this class**

Course Credit:

	Total Points
25 points Syllabus Quiz	25
30 points per LAP review questions	300
15 points per LAP skill exercises	150
200 points per final and mid-term exam	400
30 points Participation/Discussion forums	240

Total Points Possible: 1,115

Grading Scale:

- A= 90-100%
- B= 80-89.9%
- C= 70-79.9%
- D= 60-69.9%
- F= 0-59.9%

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IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.

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MoSTEMWINs – Jefferson College

Electronics Technology Certificate - Instructional Materials

Please list your instructional materials and resources; i.e., readings, websites, ancillary materials and major laboratory tools and equipment. SMEs will be looking for evidence that the program/course is linked to current industry standards and certifications and is enhanced, as possible, with online or technology-enabled learning.

Readings

BIT 128-Customer Service

Lucas, Robert W., Customer Service – Skills for Success, Sixth Edition, McGraw Hill-Irwin, 2015

CIS 150-Intro to Computer Support

Textbook(s)/Supplies: TestOut, LabSim PC Pro (A+ 901/902) Activation Code (Current Edition), TestOut Corporation

Optional Textbook: CompTIA A+ Guide to Hardware: Managing, Maintaining, and Troubleshooting, Ninth Edition, Jean Andrews, Joy Dark, and Jill West

ETC 103-DC Circuits

Textbook(s)/Supplies: NIDA, DC Circuits Textbook/Lab Manual

ETC 104-AC Circuits

Textbook(s)/Supplies: NIDA, AC Circuits Textbook/Lab Manual

CIS 125-Computer Concepts & Applications

Textbook(s)/Supplies: No text required.

ETC 132 - Semiconductors

Textbook(s)/Supplies: NIDA, Analog Circuits Textbook/Lab Manual

ETI 236 – Industrial Controls

Textbook(s)/Supplies: Rockis and Mazur, Electrical Motor Controls, Current Edition, American Technical Publishers

MTT 147 – Hydraulics & Pneumatics I

Textbook(s)/Supplies: Amatrol Basic Hydraulics Student Laps and Amatrol Basic Pneumatics Student Laps

Other Instructional Materials

Blackboard Online Discussion Boards

Major Laboratory or Learning Activity Tools/Equipment

Amatrol Motor Control Troubleshooting Learning System, Amatrol Hydraulic and Pneumatic System, NIDA Trainers



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It is the policy of Jefferson College that no person shall, on the basis of age, ancestry, color, creed, disability, genetic information, marital status, national origin, race, religion, sex, sexual orientation, or veteran status, be subject to discrimination in employment or in admission to any educational program or activity of the College. In compliance with Federal Rules and Regulations, Jefferson College has adopted a procedure for resolving complaints of discrimination. The procedure is available to any Jefferson College student, employee, or applicant who feels that he or she has been discriminated against in employment, student programs, or student activities. The Disability Support Services Office (DSS) of Jefferson College is committed to the fulfillment of equal educational opportunities, autonomy and full inclusion for students with disabilities. Disability Support Services serves to determine and ensure appropriate accommodations for qualified students with documented disabilities, to assist students in self-advocacy and to ensure compliance with the ADA, ADAAA and Section 504 of the Rehabilitation Act. Students in need of accommodations can contact Disability Support Services at (636) 481-3158; lschmid2@jeffco.edu.

MoSTEMWINS

Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

Complete one table for each program course developed or enhanced with grant funds. Consult the SME assessment rubric to ensure you provide sufficient detail in describing learning activities and assessments to showcase the strengths of your course.

Course Title: BIT 128 – Customer Service

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
<p>Students will be able to define customer service skills necessary to satisfy the customer. Students will understand the expectation of a quality product, reliable service, and reasonable prices.</p>	<p>List the six major components of a customer-focused environment</p> <p>Explain how some companies are addressing the changes impacting the service sector</p>	<p>Lectures</p> <p>Textbook</p>	<p>Written Exams</p> <p>Quizzes</p> <p>Discussion Boards</p>
<p>Students will demonstrate knowledge and understanding the importance of effective communication in customer service and recognize the elements of effective two-way interpersonal communication.</p>	<p>Describe how to avoid language that could send a negative message and harm the customer relationship</p> <p>Identify assertive communication techniques to enhance service</p> <p>Identify key differences between assertive and aggressive behavior</p>	<p>Lectures</p> <p>Textbook</p>	<p>Written Exams</p> <p>Quizzes</p> <p>Discussion Boards</p>
<p>Students will demonstrate knowledge and understanding of why listening is an important part of customer service</p>	<p>Develop strategies to improve your listening ability</p>	<p>Lectures</p> <p>Textbook</p>	<p>Written Exams</p> <p>Quizzes</p> <p>Discussion Boards</p>

<p>Students will demonstrate knowledge and understanding of a service breakdown and how to handle difficult customer situations.</p>	<p>Identify information-gathering techniques to better serve customers</p> <p>Describe why listening is important to customer service</p> <p>Define the four steps in the listening process</p> <p>List the characteristics of a good listener</p> <p>Develop effective strategies for working with internal customers</p> <p>Identify strategies for preventing customer dissatisfaction and problem solving</p>		
		<p>Lectures Textbook</p>	<p>Written Exams Quizzes Discussion Boards</p>

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Course Title: ETC 103 – DC Circuits

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
Students will demonstrate knowledge and understanding of the concepts of direct current theory and laws related to the study of voltage, current, resistance, and power in direct current circuits.	<p>Define potential difference and the volt as the unit of measure for potential difference</p> <p>Define current and the ampere as the unit of measure for current</p> <p>State Ohm's Law and define the relationship between current, voltage, and resistance</p> <p>Define power in an electrical circuit in terms of current and voltage</p>	<p>Lectures</p> <p>Textbook Readings</p> <p>Demonstrations</p> <p>Hands-On Activities</p>	<p>Written Exams</p> <p>Quizzes</p> <p>Hands-On Exercises</p> <p>Discussion Boards</p>
Students will demonstrate knowledge and understanding of how to use a multimeter through hands-on experiments	<p>Measure DC and AC voltages with respect to any other voltage, using both digital and analog multimeters</p> <p>Measure resistance in electrical circuits using both analog and digital multimeters</p>	<p>Lectures</p> <p>Textbook/Lab Manual</p> <p>Readings</p> <p>Demonstrations</p> <p>Hands-On Activities</p>	<p>Written Exams</p> <p>Quizzes</p> <p>Hands-On Exercises</p> <p>Discussion Boards</p>

	<p>Measure DC current in electrical circuits using a digital multimeter</p>		
<p>Students will construct circuits on the trainers to operate series, parallel, and complex series/parallel circuits.</p>	<p>Recognize a series circuit and define the relationship of current, resistance, and power in a series circuit</p> <p>Identify a parallel circuit and determine that applied voltage E_a is the same across each parallel branch in a parallel circuit</p> <p>Recognize the series and parallel branches in series-parallel circuits</p> <p>Measure voltage, current, and resistance in series-parallel circuits and demonstrate the validity of calculated values by comparing them with the measured values</p>	<p>Lectures Textbook Readings Demonstrations Hands-On Activities</p>	<p>Written Exams Quizzes Hands-On Exercises Discussion Boards</p>
<p>Students will identify common components used in direct current circuits.</p>	<p>Describe a basic electric circuit with load and the schematic diagram which represents it</p> <p>Identify chassis ground, earth</p>	<p>Lectures Textbook Readings Demonstrations Hands-On Activities</p>	<p>Written Exams Quizzes Hands-On Exercises Discussion Boards</p>

	ground, and common in an electrical system and draw the schematic symbols		
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MoSTEMWINS

Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

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Course Title: ETC 104 - AC Circuits

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
Students will be able to define alternating current theory.	Define alternating current Identify an AC sine wave Define frequency and cycle Describe Hertz Determine the wavelength of a sine wave Determine the period of a sine wave	Lectures Textbook/Lab Manual Readings Demonstrations Hands-On Activities	Written Exams Quizzes Hands-On Exercises Discussion Boards
Students will demonstrate knowledge and understanding of the concepts and laws related to the study of voltage, current, impedance, and power in alternating current circuits.	Recognize a series circuit and define the relationship of current, resistance, and power in a series circuit Identify a parallel circuit and determine that applied voltage E_a is the same across each parallel branch in a parallel circuit Recognize the series and parallel	Lectures Textbook/Lab Manual Readings Demonstrations Hands-On Activities	Written Exams Quizzes Hands-On Exercises Discussion Boards

	<p>branches in series-parallel circuits</p> <p>Measure voltage, current, and resistance in series-parallel circuits and demonstrate the validity of calculated values by comparing them with the measured values</p>		
<p>Students will construct circuits on the trainers to operate series, parallel, and complex series/parallel circuits.</p>	<p>Use Ohm's Law to determine resistance in an AC series circuit</p> <p>Identify the relationship between voltage, current, and resistance in an AC series circuit</p> <p>Use Ohm's Law to determine resistance in an AC parallel circuit</p> <p>Identify the relationship between voltage, current, and resistance in an AC parallel circuit</p> <p>Use Ohm's Law to determine resistance in an AC series-parallel circuit</p> <p>Identify the relationship between voltage, current, and resistance in an AC series-parallel circuit</p>	<p>Lectures Textbook/Lab Manual Readings Demonstrations Hands-On Activities</p>	<p>Written Exams Quizzes Hands-On Exercises Discussion Boards</p>

<p>Students will setup an oscilloscope for normal use</p>	<p>Set up an oscilloscope for normal use</p> <p>Measure voltage using an oscilloscope</p> <p>Measure frequency using an oscilloscope</p> <p>Set up an oscilloscope for normal use</p> <p>Measure voltage using an oscilloscope</p> <p>Measure frequency using an oscilloscope</p> <p>Set up an oscilloscope for normal use</p> <p>Measure voltage using an oscilloscope</p> <p>Measure frequency using an oscilloscope</p>	<p>Lectures</p> <p>Textbook/Lab Manual</p> <p>Readings</p> <p>Demonstrations</p> <p>Hands-On Activities</p>	<p>Written Exams</p> <p>Quizzes</p> <p>Hands-On Exercises</p> <p>Discussion Boards</p>
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MoSTEMWINS

Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

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Course Title: ETC132 - Semiconductors

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
Students will be able to define and demonstrate knowledge and understanding of common types of diodes and their uses.	Identify the purpose of a diode Recognize the common types of diodes Recognize diode schematic symbols and reference designators Describe the uses of diodes Describe semiconductor material Describe P and N-type semiconductor material Describe forward and reverse biasing	Lectures Textbook Online work	Quizzes Discussion Boards Exams
Students will be able to define and demonstrate knowledge and understanding of transistors.	Describe the purpose of a transistor Describe types of transistors Identify transistor schematic symbols Identify leads on transistors	Lectures Textbook Online work	Quizzes Discussion Boards Exams

	<p>Describe the purpose of DC bias in transistors</p> <p>Describe NPN transistor bias</p> <p>Describe PNP transistor bias.</p> <p>Describe the purpose of power supplies</p> <p>Describe the sections of a typical power supply</p> <p>Identify half-wave rectifiers</p> <p>Identify full-wave rectifiers</p> <p>Identify bridge rectifiers</p>	<p>Lectures</p> <p>Textbook</p> <p>Online work</p>	<p>Quizzes</p> <p>Discussion Boards</p> <p>Exams</p>
<p>Students will be able to define and demonstrate knowledge and understanding of Power Supplies and Diode Rectifiers</p>	<p>Describe the purpose of sine wave oscillators</p> <p>Describe a basic sine wave oscillator circuit</p> <p>Identify LC oscillators</p> <p>Identify RC oscillators</p> <p>Identify crystal oscillators</p>	<p>Lectures</p> <p>Textbook</p> <p>Online work</p>	<p>Quizzes</p> <p>Discussion Boards</p> <p>Exams</p>

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MoSTEMWINS

Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

Complete one table for each program course developed or enhanced with grant funds. Consult the SME assessment rubric to ensure you provide sufficient detail in describing learning activities and assessments to showcase the strengths of your course.

Course Title: ETI236 – Industrial Controls

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
<p>Demonstrate knowledge and understanding of electrical schematics, diagrams, symbols, and control logic</p>	<p>Identify the differences between pictorial drawings, wiring diagrams, schematic diagrams, line diagrams, block diagrams, and flow charts</p> <p>Identify the difference between the switch symbols normally open, normally closed, normally open-held closed, and normally closed-held open</p>	<p>Lectures Textbook Online work</p>	<p>Quizzes Discussion Boards Exams</p>
<p>Demonstrate knowledge and understanding of proper use of test equipment for troubleshooting</p>	<p>Explain how to troubleshoot fuses</p> <p>Explain the procedure to setup a multimeter to test resistance, ac voltage, dc voltage, and amp draw</p>	<p>Lectures Textbook Online work</p>	<p>Quizzes Discussion Boards Exams</p>
<p>Demonstrate knowledge and understanding of input control devices, solenoids,</p>	<p>Identify input control devices, solenoids, relays, contactors, and motor starters</p>	<p>Lectures Textbook Online work</p>	<p>Quizzes Discussion Boards Exams</p>

<p>relays, contactors, and motor starters</p>	<p>Wire and setup input control devices, solenoids, relays, contactors, and motor starters on a control board</p>		
<p>Demonstrate knowledge and understanding of AC, DC, and variable frequency drive motors</p>	<p>List and describe the parts of a dc motor Explain how to troubleshoot open winding, shorted winding and a short to ground on a dc and ac motor List and describe the parts of a ac motor</p>	<p>Lectures Textbook Online work</p>	<p>Quizzes Discussion Boards Exams</p>

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8-16



MoSTEMWINS

Overview Table of Course Components: Course Objectives, Module/Unit Objectives, Activities and Assessments

Complete one table for each program course developed or enhanced with grant funds. Consult the SME assessment rubric to ensure you provide sufficient detail in describing learning activities and assessments to showcase the strengths of your course.

Course Title: MTT147 – Hydraulics & Pneumatics

COURSE OBJECTIVE	MODULE-/UNIT-LEVEL OBJECTIVE	LEARNING ACTIVITIES	ASSESSMENTS
Students will be able to define pneumatics/hydraulics and give an application of each.	Describe the functions of five basic components of a hydraulic system. Describe the functions of basic components of a pneumatic system	Lectures Textbook Online work	Quizzes Discussion Boards Exams
Students will demonstrate the ability to read gauges and adjust fluid power for pneumatics and hydraulics.	Define hydraulic and pneumatic pressure and give its units of measurement Define pneumatic pressure and give its units of measurement Read a hydraulic pressure gage Read a pneumatic pressure gage Operate a hydraulic power unit	Lectures Textbook Online work	Quizzes Discussion Boards Exams
Students will construct circuits on the trainers to operate different components of pneumatic and hydraulic systems.	Connect and operate a double-acting hydraulic cylinder using a 3-position, manually-operated DCV Connect and operate a bi-directional hydraulic motor using a 3-position, manually-operated DCV Connect and operate a double-acting pneumatic cylinder using a 3-position, manually-operated DCV	Lectures Textbook Online work	Quizzes Discussion Boards Exams

<p>Students will design a schematic of pneumatic/hydraulic systems and then build them.</p>	<p>Connect and operate a unidirectional pneumatic motor using a 3-way, manually-operated DCV</p>		
<p>Students will illustrate the needed preventive maintenance on pneumatic and hydraulic systems.</p>	<p>Design a dual cylinder hydraulic circuit Design a multiple actuator hydraulic circuit Design a multiple cylinder pneumatic circuit Design a multiple actuator pneumatic circuit Draw a pneumatic schematic from the actual circuit connections on the machine Read the liquid level and temperature in the reservoir Describe the function of an air filter</p>	<p>Lectures Textbook Online work</p>	<p>Quizzes Discussion Boards Exams</p>
		<p>Lectures Textbook Online work</p>	<p>Quizzes Discussion Boards Exams</p>

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Statement of Programmatic Innovation and/or Enhancement

Provide a one- or two-page document describing specific examples of how the program incorporates one or more of the MoSTEMWINs key strategies:

1) Accelerate Entry into Career Programs - Refine assessment, transform developmental education and add support services to meet the needs of participants.

The Electronics Technology Certificate program supports student efforts, and educational and personal needs through the Intentional Navigation System (PREP) and the ETC (dedicated) Program Navigator to ensure students have that which they need, when they need it, with possible intervention. With this approach, students have a partner to ensure their walk through this educational experience is one of support and follow up. The Navigator and Instructor are in frequent dialogue regarding the student's success, as much as they are in dialogue with each respective student. From the time a potential student determines intent to apply to the school/program, through assessment, placement, and into classroom, students' attendance, assignments, posts, quizzes, lab-time, and exams are all tracked. Students also have access through PREP to the comprehensive listing of services and resources for Jefferson College and for the County/Region. This resource list is updated every semester, and modifications are made both on hard copy and through the PREP System.

The coursework offered through the ETC Program allowed opportunities for latticing/ladder for a person to gain additional skill sets and credentials. In addition, it allows participants the flexibility to jump into industry related work and/or continue on their educational pathway.

2) Create Clear Pathways to STEM Careers - Expand access to and/or develop new stacked and latticed credentials in programs that meet employer needs.

The Electronics Technology Certificate program provides participants with the opportunity to learn new skills to enhance their employment. This program, like many others in Career and Technical Education relies on the relationships that it has with their Advisory Committees. Those committees are made up of representatives from business and industries in our geographic region. They are extremely important as they relay changes that occur, needs that are shared, and cutting edge, innovative opportunities to allow us as educational partners to stay on point, thus ensuring provisions are made to update curriculum, classroom and lab equipment, systems, technology, and supplies needed for training. Students prepare not only through the