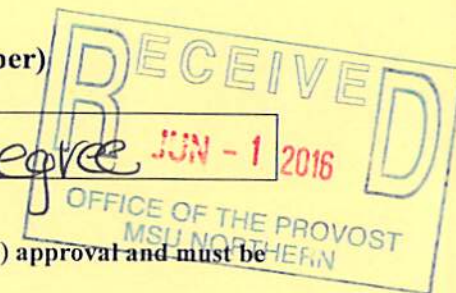


**ACADEMIC SENATE PROPOSAL TRACKING SHEET**  
(Document To Be Originated By the Academic Senate Secretary On Canary Color Paper)

Proposal # <b>15-33</b>	Title: <b>Electronic Technician AAS degree</b>
-------------------------	--

(Proposal explanation, submitter and college dean signatures on attached program/degree or course revision form.)



All proposals **MUST** have their originating college faculty body (Ex. Arts & Sciences, Education and Nursing; Technical Sciences) approval and must be signed by the submitter and the college dean before being submitted to the Academic Senate Secretary.

1. Submit all proposals (using the appropriate Academic Senate program/degree and/or course revision forms or General Education Inclusion form) to the Academic Senate Secretary. NOTE: Level 1 or Level 2 forms must be submitted concurrent with this proposal where applicable. For Education proposals, PEU approval must be received prior to forwarding the proposal to the Senate.
2. The Academic Senate Secretary logs and numbers items and forwards them to the appropriate Academic Senate subcommittee(s): General Education (if applicable), or Curriculum. A transmittal e-mail will be sent to the Recording Secretary of the receiving committee, cc Provost's Administrative Assistant, by the Academic Senate Secretary. A digital copy of the proposal will be linked on the Academic Senate Proposal page by the Academic Senate Secretary.
3. The Academic Senate subcommittee(s) consider(s) the proposal. If approved, the proposal is returned to the Academic Senate Secretary for forwarding to the next committee. If a committee disapproves the proposal, the originator may request that the item be forwarded to the next body for consideration. The committee will provide written rationale to the originator, via the Academic Senate, when a proposal is disapproved and the proposal is returned to the originator. Upon completion of committee action, the proposal will be returned to the Academic Senate Secretary, and a transmittal e-mail sent by the Committee Recorder to the Senate Secretary, cc Provost's Administrative Assistant.
4. The Academic Senate considers the proposal and recommends approval or disapproval. If approved, the proposal is forwarded to the Provost for consideration. If the Academic Senate disapproves the proposal, the originator may request that the item be forwarded to the Full Faculty for consideration, utilizing the procedures set forth in the Senate Bylaws. The Academic Senate will provide written rationale to the originator when proposals are disapproved and the proposal is returned to the originator.
5. Approved proposals will be forwarded to the Provost. The Provost approves or disapproves the proposal. If approved, the proposal is then forwarded to the Chancellor. From this point forward, the Provost's Administrative Assistant will update the Proposal page on the website by contacting the webmaster.
7. The Chancellor approves or disapproves the proposal.
8. The proposal will then either be implemented or referred to MSU for further action. The tracking page on the Provost site will be updated as required.

Subcommittee and Academic Senate college representatives will notify their respective colleges' of the progress of submitted proposals or the proposal may be tracked via the web page -- <http://www.msun.edu/admin/provost/senate/proposals.htm>

Documentation and forms for the curriculum process is also available on the web page:  
<http://www.msun.edu/admin/provost/forms.htm>

\*\*\*\*\*(If a proposal is disapproved at any level, it is returned through the Academic Senate secretary and the Senate President, to the Dean of the submitting college who then notifies the originator.



	Date	Action Taken	Signature	Date	Comments/Reason for Disapproval	Sent to	Date	Transmittal E-mail sent
*Abstract received by Senate Secretary		Copy to Senate President. Forward to Provost.						
*Provost		<input type="checkbox"/> Abstract Approved <input type="checkbox"/> Disapproved						
Received by Senate Secretary	1/29/16	Tracking form initiated	<i>[Signature]</i>			Grant Slocum	3/30/16	Inter Office
General Education Committee (if applicable)	3/30/16	<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved NA	<i>[Signature]</i>	3/30/16	forward to Curriculum Comm	Byron Ophus	3/30/16	Inter Office
Curriculum Committee (if applicable)	4-28-16	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	Byron Ophus	4-28-16	forward to Ac. Senate	Forrest Schlotfeldt	5/9/16	Inter Office
Academic Senate	5-19-16	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>[Signature]</i>		forward to Provost office	William Bugg	6/1/16	Inter Office
Full Faculty (if necessary)		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved						
Provost	6-13-16	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	Wm. J. Rugg	6-13-16	FORWARD TO CHANCELLOR	Greg Kegel	6-13-16	Hand Delivered
Chancellor		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	<i>[Signature]</i>	6-13-2016		Bozeman OCHC		Email
MSU		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved		June 2016				
BOR		<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved	OCHE Approved	June 2016				
NWCCU		<input type="checkbox"/> Approved <input type="checkbox"/> Disapproved						
Provost		Advise originating college and Academic Senate of status. Update Web page.						
Registrar		Catalog/Policy Manual Update						

**NOTE:** The secretary of the Academic Senate will update the Academic Senate Proposal web page from initial receipt until the proposal reaches the Provost. The Provost's Administrative Assistant will ensure that the current status of each proposal is maintained on the Academic Senate Proposal web page from that point forward. \*Abstract and pre-approval required for new programs ONLY.

June 2016

**171-2802-LI0616**

**ITEM**

**Electronics Technician AAS – MSUN requesting permission to offer degree**

---

**THAT**

Montana State University Northern requests permission to offer the Electronics Technician AAS degree program to facilitate course sharing agreement with Flathead Valley Community College (FVCC).

---

**EXPLANATION**

This request is to duplicate the Electronics Technician Associate of Applied Science as implemented by FVCC. FVCC will provide online instruction of lecture portions of the program. MSU Northern will provide hands-on laboratory instruction in support of the online program in accordance with course sharing policies established by OCHE and the BOR and as formalized in MOU documentation between MSUN and FVCC.

---

**ATTACHMENTS**

Academic Proposal Request Form  
Curriculum Proposal Form  
MSU Northern program proposal Attachment #1 – A1  
FVCC program information Attachment #2 – A2

Montana Board of Regents  
ACADEMIC PROPOSAL REQUEST FORM

ITEM 171-2802-LI0616 Submission Month or Meeting: June 2016

Institution: MSU Northern CIP Code: 15.0399

Program/Center/Institute Title: Electronics Technician AAS

Includes (please specify below): Online Offering  Options \_\_\_\_\_

Please mark the appropriate type of request and submit with an Item Template and any additional materials, including those listed in parentheses following the type of request. For more information pertaining to the types of requests listed below, how to complete an item request, or additional forms please visit <http://mus.edu/che/arsa/preparingacademicproposals.asp>.

**A. Level I:**

**Campus Approvals**

- \_\_\_\_\_ 1a. Placing a postsecondary educational program into moratorium (Program Termination and Moratorium Form)
- \_\_\_\_\_ 1b. Withdrawing a postsecondary educational program from moratorium
- \_\_\_\_\_ 2. Establishing, re-titling, terminating or revising a campus certificate of 29 credits or less
- \_\_\_\_\_ 3. Establishing a B.A.S./A.A./A.S. area of study
- \_\_\_\_\_ 4. Offering an existing postsecondary educational program via distance or online delivery

**OCHE Approvals**

- \_\_\_\_\_ 5. Re-titling an existing postsecondary educational program
- \_\_\_\_\_ 6. Terminating an existing postsecondary educational program (Program Termination and Moratorium Form)
- \_\_\_\_\_ 7. Consolidating existing postsecondary educational programs (Curriculum Proposal Form)
- \_\_\_\_\_ 8. Establishing a new minor where there is a major or an option in a major (Curriculum Proposal Form)
- \_\_\_\_\_ 9. Revising a postsecondary educational program (Curriculum Proposal Form)
10. Establishing a temporary C.A.S. or A.A.S. degree program *Approval limited to 2 years*



**Montana Board of Regents**  
**ACADEMIC PROPOSAL REQUEST FORM**

**B. Level II:**

1. **Establishing a new postsecondary educational program** (Curriculum Proposal and Completed Intent to Plan Form)
2. **Exceeding the 120 credit maximum for baccalaureate degrees** *Exception to policy 301.11*
3. **Forming, eliminating or consolidating an academic, administrative, or research unit** (Curriculum or Center/Institute Proposal and Completed Intent to Plan Form, except when eliminating or consolidating)
4. **Re-titling an academic, administrative, or research unit**

**Specify Request:**

MSU Northern requests permission to offer degree programs to facilitate a course sharing agreement with Flathead Valley Community College (FVCC). This request is to duplicate the Electronics Technician Associate of Applied Science as implemented at FVCC. FVCC will provide online instruction of lecture portions of the program. MSU Northern will provide hands-on laboratory instruction in support of the online program in accordance with course sharing policies established by OCHE and the BOR and as formalized in MOU documentation between MSUN and FVCC.

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**1. Overview**

- A. Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor or option is sought.**

This proposal will establish the Electronics Technician program currently approved for Flathead Valley Community College. Based on course sharing policies developed as part of the RevUP grant, MSU Northern will participate as an assessment center/training center for FVCC courses by providing the hands-on laboratory portions of the degree program. Students will enroll with MSU Northern and will simultaneously be enrolled in distance delivered (D2L) courses instructed by FVCC. The laboratory portions will be scheduled in cooperation and coordination with the programs at FVCC (Attachment A2) and offered in labs at Northern using instructors on the MSUN campus.

**2. Institutional and System Fit**

- A. What is the connection between the proposed program and existing programs at the institution?**

Currently MSU Northern offers electronics instruction as part of Automotive and Diesel Technology AAS and BS programs as well as part of the Secondary Ed. Industrial Technology degree and the Electrical Technology AAS degree program. Some coursework in electronics are included in the current Design Drafting program at Northern.

- B. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.**

None anticipated. Instructors will include lab experiences as part of existing course load or receive overload/adjunct contracts to offer the lab instruction.

- C. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).**

N/A

- D. How does the proposed program serve to advance the strategic goals of the institution?**

This program reinforces the commitment of MSU Northern to offer technical education programs and to cooperate with colleagues throughout the system in offering instruction.

- E. Describe the relationship between the proposed program and any similar programs within the Montana University System. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement(s) as part of the documentation.**

As indicated, this is a course-sharing program established through the RevUP course sharing initiative. A copy of the MOU with FVCC is attached. (Attachment A2)

**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**3. Program Details**

- A. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog or other publications. NOTE: In the case of two-year degree programs and certificates of applied science, the curriculum should include enough detail to determine if the characteristics set out in Regents' Policy 301.12 have been met.**

See program proposal. (Attachment A1)

- B. Describe the planned implementation of the proposed program, including estimates of numbers of students at each stage.**

This program was incorporated to take advantage of existing labs used for Electronics Engineering Technology instruction that has been eliminated due to lack of enrollment. Since that time employers in the MSU Northern service region, particularly Triangle communications, Nemont and other companies in the telecommunications and energy sector have identified a need to replace significant numbers of technicians to replace a graying workforce. This program is viewed as a cost effective, innovative solution to that need. If approved, promotion of this innovative program will begin Fall 2016 with the goal of enrolling 5 students during the 2016/17 academic year. Capacity of the program is roughly 20 total students, spread across the two-year program.

**4. Need**

- A. To what specific need is the institution responding in developing the proposed program?**

FVCC and the RevUP grant has identified a statewide demand for trained electronics technicians. This program seeks to expand the audience and ability to deliver instruction to that audience.

- B. How will students and any other affected constituencies be served by the proposed program?**

Graduates will be qualified to fill good-paying jobs in a growing career field.

- C. What is the anticipated demand for the program? How was this determined?**

Estimates from FVCC indicate a demand of over 10 students per year using this course-sharing model.

**5. Process Leading to Submission**

- A. Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.**

The program of course sharing was developed as part of the Two-Year leadership council using the RevUP grant as impetus. The program itself echoes the successful program offered by FVCC, and as implemented at Northern has been reviewed and approved by COTS faculty, the MSUN Academic Senate and by the MSUN administration.



**Montana Board of Regents**  
**CURRICULUM PROPOSAL FORM**

**6. Resources**

- A. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.**

Faculty currently on staff will provide support for this program with the availability for adjunct instructors from the local community as the program expands.

- B. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting this need.**

FVCC has provided substantial equipment and material support through the RevUP grant. No additional resources are required at this time.

**7. Assessment**

- A. How will the success of the program be measured?**

Success will be gauged based on continued progress of enrolled students with successful completion within three years.



*DRAFT 9/14/15*

**Memorandum of Understanding**

This Agreement is made between Flathead Valley Community College ("FVCC") and \_\_\_\_\_ (the Enrolling Institution or "EI"); collectively the "Parties." This Agreement shall be deemed executed and agreed to by both Parties as of the date it has been signed by both Parties.

**RECITALS**

WHEREAS, FVCC and the Enrolling Institution wish to establish a course sharing agreement between them, for the purpose of enabling students enrolled at the EI to take certain online courses through FVCC; and

WHEREAS, both FVCC and the EI are Montana 2-year colleges that are participating as consortium members in the Trade Adjustment Assistance Community College and Career Training Grant #TC-25034-13-60-A-30 ("RevUp"); and

WHEREAS, RevUp establishes a mechanism to offer students across the State of Montana the opportunity to take advanced manufacturing online courses developed by FVCC at their Enrolling Institution, which also functions as an "Assessment Center" by offering the lab portions of such online courses to students; and

WHEREAS, this Course Sharing Memorandum of Understanding is necessary to establish the responsibilities of the EI and FVCC and to apportion funding and student counts between the colleges;

NOW, THEREFORE it is mutually agreed as follows:

- 1. Term of MOU.** This MOU shall be effective January 1, 2016 and shall be in effect through the end of the RevUp grant.
- 2. Academic Calendar.** FVCC's academic calendar governs this MOU.
- 3. Academic Catalog.** The EI agrees to put the FVCC programs and associated courses listed on the attached Exhibit A in their academic catalog (except those courses not offered online), including FVCC's pre-requisites, co-requisites, course sequencing and placement guidelines (see Course Profiles, Exhibit B), and will secure any necessary approvals for such action, including approvals required by the Montana Board of Regents.

All of FVCC's programs require: one quantitative (math) course, one or two communication courses, an interactions course and one basic computer course. If one of the EI's students would like to substitute a different course than specified in Exhibit A, the student must secure approval for such substitution from the EI.

- 4. Course Schedule.** FVCC will offer the online courses set forth below in the spring 2016 semester (See Exhibit A for details), and will add additional sections of these courses, subject to instructor availability, should demand and enrollment exceed existing class capacity.

**Industrial Maintenance: Tier II**

Machinist Technician: Tier II and Tier IV

Electronics Technician: Tier II and Tier IV

Following the spring 2016 semester, FVCC will collaborate with the EI on scheduling, and will determine the sequence of courses and course schedule, including labs, by mutual agreement.

**5. Course Content.** The EI agrees to the course syllabi prepared by FVCC instructors for the lecture component of FVCC's online courses for the spring 2016 semester, copies of which will be provided to the instructors teaching the lab portion of FVCC's online courses. EI lab instructors will prepare a syllabus for the lab portion of these courses that is integrated into the lecture portion of the course and that is consistent with the course profiles attached as Exhibit B. The EI lab instructors will be added as students to the online lecture courses, which access shall serve as the primary source of course content and course progress for the instructors.

The lab schedule will be determined by the FVCC online instructor and the EI lab instructor with sufficient flexibility to ensure student success while achieving course outcomes. FVCC will provide its own lab course schedule to the EI to assist in developing the EI's lab schedule. The lab schedule at the EI must be available to students when the EI course schedule is published.

In addition, the EI agrees to ensure qualified instructors teach the same learning outcomes in the labs as FVCC, per the Course Profiles and Common Course Numbering Guidelines, and that such instructors will confer as needed with FVCC's instructors to assure student success in the online courses. Course profiles for all FVCC online courses are attached on Exhibit B.

After the spring 2016 semester, FVCC and the EI will collaborate on the curriculum and any changes thereto will be mutually agreed upon.

**6. Class Size.** Current enrollments in FVCC's online courses are displayed in the Course Schedule located on FVCC's web site.

**7. Learning Management System.** FVCC will provide students secure access to FVCC's learning management system – Eagle Online. Each student will have a user name and password to access the system. FVCC will provide technical support to the students throughout their enrollment in online FVCC courses.

**8. Class Rules and Policies.** Unless otherwise mutually agreed to by the Parties, FVCC's class rules and policies regarding attendance, performance and behavior will be the applicable standard for FVCC's online courses. Any student misconduct will be reported to the EI, who assumes responsibility for addressing such misconduct.

**9. Grades.** Grades for the lecture portion of FVCC's courses will be sent to the EI no later than 5:00 p.m. five (5) business days following the end of the semester. Any grade appeals will be made by a student first to the FVCC instructor and then through the EI's academic appeals process. The EI will award and hold all student transcripts for students taking any FVCC online courses.

**10. Tuition and Fees.** The EI will remit tuition compensation (based on the lowest credit hour cost amongst RevUp consortium member colleges) and FVCC's Distance Education (DE) fees to FVCC as of the 15<sup>th</sup> class day by no later than the 35<sup>th</sup> class day. FVCC will determine the tuition amount each year and

will convey this information to the EI prior to the beginning of the fall semester. FVCC's current DE fees are posted in its academic catalog and on its website. Any other fees the EI may charge its students are kept by the EI.

FVCC student withdrawal dates will govern with respect to refunds, and in the event of a withdrawal, the EI will coordinate any such refunds with FVCC according to the EI's established practices.

**11. Student Enrollment Full Time Equivalency.** The EI is entitled to maintain and report all student FTEs for those students affected by this course sharing MOU.

**12. Advising.** All student advising will be the responsibility of the EI. The EI will include information for its students about FVCC's online advanced manufacturing courses as part of its student advising.

**13. Registration.** The EI will be responsible for student registration. The EI shall provide FVCC's Registrar and Instructional Technology Specialist a list of EI students enrolling in FVCC online courses in an Excel spreadsheet (including student contact information), plus the fully executed Student Information and Consent Agreement (Exhibit C), no less than five (5) days prior to the start of class.

**14. Financial Aid.** The EI is responsible for student financial aid. The EI will allow FVCC's online courses to be included in a student's course load for financial aid purposes.

**15. Family Educational Rights and Privacy Act (FERPA).** The Parties agree to abide by the provisions of FERPA. Students affected by this Course Sharing MOU will be required by the EI to sign the Student Information and Consent Agreement attached as Exhibit C, and an executed copy of the consent agreement will be provided to FVCC prior to the start of the class for which the student is registered. FVCC and the EI agree that they shall only communicate about matters directly related to students only through FERPA-compliant means, such as the use of encrypted email that is password protected.

**16. Termination of MOU.** Either party may terminate this MOU, with or without cause, with 30 days' prior written notice delivered to the non-terminating college's CEO.

**17. Indemnification.** The EI, on behalf of itself, its directors, trustees, partners, employees, affiliates, agents, guests, and each of their agents, affiliates, successors and assigns, hereby releases and shall defend FVCC and each of its officers, agents, employees, assigns and successors in interest from and against, any and all liability, damages, losses, claims, demands, actions, causes of action, costs (including attorney's fees and expenses), or any of them, past, present or future, known or unknown, arising out of or in connection with this MOU, and shall indemnify and hold FVCC harmless to the extent allowed by law.

FVCC, on behalf of itself, its directors, trustees, partners, employees, affiliates, agents, guests, and each of their agents, affiliates, successors and assigns, hereby releases and shall defend the EI and each of its officers, agents, employees, assigns and successors in interest from and against, any and all liability, damages, losses, claims, demands, actions, causes of action, costs (including attorney's fees and expenses), or any of them, past, present or future, known or unknown, arising out of or in connection with this MOU, and shall indemnify and hold the EI harmless to the extent allowed by law.

**18. Entire Agreement.** This Agreement contains the entire agreement and understanding between the Parties regarding course sharing of FVCC online advanced manufacturing courses, and merges and supersedes all prior representations and discussions pertaining to the subject matter herein.



**19. Amendment.** Any changes, exceptions, or different terms and conditions shall be only by written amendments to this Agreement, mutually agreed to and executed by the Parties.

**20. Severability.** The invalidity or unenforceability of any provisions of this course sharing MOU shall not affect the validity or enforceability of any other provision of this MOU, which shall remain in full force and effect.

**21. Interpretation and Jurisdiction.** This Agreement shall be interpreted, governed, and construed under the laws of the State of Montana.

**22. Binding Authority.** The person signing this Agreement represents that he or she is duly authorized to execute this Agreement on behalf of the Party for whom he or she signs, and to fully bind such Party to this Agreement.

Flathead Valley Community College:

By: \_\_\_\_\_

Date: \_\_\_\_\_

Jane A. Karas, Ph.D., President

\_\_\_\_\_, Enrolling Institution:

By: \_\_\_\_\_

Date: \_\_\_\_\_

Name and Title

## EXHIBIT A

### FVCC ONLINE ADVANCED MANUFACTURING PROGRAMS

*{Italicized courses are not offered online}*

#### Electronics Technician, CT, CAS, AAS

##### Fall Semester (Tier I)

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
<i>CAPP 106*</i>	<i>Short Courses: Computer Applications</i>	<i>1</i>
or		
CAPP 114	Short Courses: MS Word	1
or		
CAPP 116	Short Courses: MS Excel	1
ECP 104	Workplace Safety	1
ELCT 100	Introduction to Electricity	3
ELCT 110	Basic Electricity I	5
ELCT 137	Electrical Drafting	2
M 114*	Extended Technical Mathematics	3
MCH 101	Intro to Manufacturing Processes	1
	<b>Semester Total</b>	<b>16</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

##### Spring Semester (Tier II)

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
BMGT 205C	Professional Business Communication	
or		
<i>COMX 115C</i>	<i>Intro. to Interpersonal Communications</i>	<i>3</i>
ELCT 102*	Electrical Fundamentals II	4
ELCT 111	Electric Meters and Motors	3
ETEC 130	Panel Wiring and Soldering	2
PHSX 110*	Applied Physics	4
	<b>Semester Total</b>	<b>16</b>
	<b>CAS Total Credits</b>	<b>32</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

**Fall Semester (Tier III)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
ELCT 210*	Advanced Current Theory	5
ELCT 250	Programmable Logic Controllers	4
ETEC 245*	Digital Electronics	4
ETEC 250*	Solid State Electronics I	4
	<b>Semester Total</b>	<b>17</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

**Spring Semester (Tier IV)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
BMGT 205C*	Professional Business Communication	
	or	
COMX 115C	Intro to Interpersonal Communication	3
ELCT 211*	AC Measurements	3
ETEC 280*	Advanced Electronics	4
ETEC 285*	Adv. Programmable Controllers	4
ETEC 299*	Capstone: Electronics	3
	<b>Semester Total</b>	<b>17</b>
	<b>AAS Degree Total Credits</b>	<b>66</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

**Industrial Maintenance, CT****Fall Semester (Tier I)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
ECP 104	Workplace Safety	1
ELCT 100	Introduction to Electricity	3
M 111*	Technical Mathematics	3
MCH 101	Intro. to Manufacturing Processes	1
MCH 120	Blueprint Reading & Int. Mach.	3
MCH 129	Machine Quality Control and Precision Measurements	3
MCH 132*	Introduction to Engine Lathes	4
	<b>Semester Total</b>	<b>18</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*



**Spring Semester (Tier II)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
BMGT 205C	Professional Business Communication	
or		
COMX 115C	Intro to Interpersonal Communication	3
CAPP 106*	Short Courses: Computer Applications	
or		
CAPP 114	Short Courses: MS Word	
or		
CAPP 116	Short Courses: MS Excel	1
CSTN 125	Basic Cabinetry and Furniture Making	3
ELCT 111	Electric Meters and Motors	3
MCH 102	Intro to Manufacturing Materials	2
WLDG 111*	Welding Theory I Practical	4
	<b>Semester Total</b>	<b>16</b>
	<b>CAS Total Credits</b>	<b>34</b>

**Industrial Machine Technology, AAS, CAS, CT**

**Fall Semester (Tier I)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
ECP 104	Workplace Safety	1
M 111*	Technical Mathematics	3
MCH 101	Intro to Manufacturing Processes	1
MCH 120	Blueprint Reading & Int. Mach.	3
MCH 129	Machine Quality Control and Precision Measurements	3
MCH 132	Introduction to Engine Lathes	4
MCH 134	Introduction to Mills	4
	<b>Semester Total</b>	<b>19</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

**Spring Semester (Tier II)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
BMGT 205C	Professional Business Communication	
or		
COMX 115C	Intro to Interpersonal Communication	3
DDSN 135	Solidworks	2

MCH 102	Intro. to Manufacturing Materials	2
MCH 122	Introduction to CAM	3
MCH 125*	Intro to CNC Lathe Operations	3
MCH 127*	Intro to CNC Mill Operations	3
MFGT 115	Machine Shop Fundamentals	2
	<b>Semester Total</b>	<b>18</b>
	<b>CAS Total Credits</b>	<b>37</b>

**Fall Semester (Tier III)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
MCH 220*	Geometric Dimensioning and Tolerancing	3
MCH 221*	Advanced Manual Mill	3
MCH 222*	Advanced CNC Mill Operations	3
MCH 225	Machinery's Handbook	3
MCH 226*	Advanced CAD/CAM	4
	<b>Semester Total</b>	<b>16</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

**Spring Semester (Tier IV)**

<u>Course#</u>	<u>Title</u>	<u>Credits</u>
BMGT 205C*	Professional Business Communication	
	or	
COMX 115C	<i>Intro to Interpersonal Communication</i>	3
MCH 227*	Swiss CNC and Mill-Turn Systems	4
MCH 223*	Advanced Manual Lathe	3
MCH 224*	Advanced CNC Lathe Operations	3
MCH 299*	Capstone: Machinist	3
	<b>Semester Total</b>	<b>16</b>
	<b>AAS Degree Total Credits</b>	<b>69</b>

*\*Indicates prerequisite and/or corequisite required; check course description.*

**Note:** Although M111 and M114 are offered fully online, students are required to schedule a 1 hour conference with their instructor each week.

**EXHIBIT B: COURSE PROFILES**

<b>Proposed Course Splits</b>			
ELCT	100	Introduction to Electricity	ELCT 107 – Lecture Only
			ELCT 108 – Lab Only
ELCT	110	Basic Electricity I	ELCT 112 – Lecture Only
			ELCT 113 – Lab Only
ELCT	137	Electrical Drafting	ELCT 135 – Lecture Only
			ELCT 136 – Lab Only
ELCT	210	Advanced Current Theory	ELCT 208 – Lecture Only
			ELCT 209 – Lab Only
ELCT	250	Programmable Logic Controllers	ELCT 248 – Lecture Only
			ELCT 249 – Lab Only
ETEC	245	Digital Electronics	ETEC 243 – Lecture Only
			ETEC 244 – Lab Only
ETEC	250	Solid State Electronics	ETEC 248 – Lecture Only
			ETEC 249 – Lab Only
MCH	101	Introduction to Manufacturing Processes	MCH 105 – Lecture Only
			MCH 106 – Lab Only
MCH	120	Blueprint Reading and Interpretations for Machining	MCH 118 – Lecture Only
			MCH 119 – Lab Only
MCH	129	Machine Quality Control and Precision Measurements	MCH 126 – Lecture Only
			MCH 128 – Lab Only
MCH	132	Introduction to Engine Lathes	MCH 131 – Lecture Only
			MCH 133 – Lab Only
MCH	134	Introduction to Mills	MCH 135 – Lecture Only
			MCH 138 – Lab Only
MCH	221	Advanced Manual Mill	MCH 216 – Lecture Only
			MCH 217 – Lab Only
MCH	222	Advanced CNC Mill Operations	MCH 218 – Lecture Only
			MCH 219 – Lab Only
MCH	226	Advanced CAD-CAM	MCH 228 – Lecture Only
			MCH 229 – Lab Only



## EXHIBIT C

### STUDENT INFORMATION AND CONSENT AGREEMENT

For students enrolling in courses offered through the RevUp Consortium

\*To be posted on the Enrolling Institution's website with requirement that student read and execute prior to registration in FVCC online courses.

**1. Course Information.** *Insert name of Enrolling Institution* entered into a Course Sharing Memorandum of Understanding with Flathead Valley Community College (FVCC) which will expand your opportunity to select and access high-quality online courses from FVCC. Even though the online lecture courses are taught by FVCC faculty or instructors, credits earned count toward your degree/program here, your financial aid will not be affected, and you will not need to transfer credits. If there is a lab portion associated with the course you choose, it will be taught by our faculty or instructors on this campus. If you elect to register for one of these courses, you must be aware of the following information and agree to the policies that govern the course delivery.

**2. Registration.** Courses offered through FVCC will be listed in our academic catalog. You may register for the course through our usual registration process, paying all tuition and fees in the process. Since you will be enrolling as our student, you are responsible for adhering to the established policies and procedures found in our catalog and student handbook, including the refund policy. In addition, you are responsible for adhering to established academic policies and procedures of FVCC when enrolled in an FVCC online course.

Please note: Special discounts and tuition waivers may not apply to this course. Also, registration and enrollment deadlines at FVCC may differ from ours.

**3. Delivery.** FVCC is accredited by the Northwest Commission on Colleges and Universities. FVCC's course instructor will supply the syllabus via email or via a link in their learning management system. It is your responsibility to contact the course instructor and comply with the requirements and the schedule of the course. It is also your responsibility to comply with the academic policies of FVCC in areas such as academic integrity, course performance, and behavioral standards. Evaluation of your performance and computation of the grade in the lecture portion of your course is the responsibility of the instructor at FVCC. Any dispute regarding process or content of that evaluation is subject to the review policies of FVCC.

This course will be completed online and there will be no in-person meeting requirements for the lecture component of the course; however, some courses may require occasional conference calls between the student and instructor and the course may contain a lab component which you will take at *Insert name of Enrolling Institution*. The online instructor may require a proctored exam and will give you guidelines to follow. Course materials may be provided through FVCC's learning management system which may or may not be the same as ours. The course instructor or a representative from FVCC will contact you with information regarding how to enter its learning management system. It is your responsibility to remember the unique username and password for this course. Keep a record of this information and who to contact at FVCC in case there is an issue.

**4. Start/End Dates.** It is your responsibility to review the course syllabus and know when the course begins and ends. These dates may differ from a majority of the courses offered by our institution.

**5. Financial Aid.** If you are eligible for federal financial aid programs, this course will not affect your eligibility. Even though the online lecture instructor does not work for our institution, this course has been approved by the appropriate academic department at Insert name of Enrolling Institution.

**6. Records.** Data from your academic record at Insert name of Enrolling Institution will be shared with appropriate persons from FVCC including, but not limited to, name, address, phone number, email address, and student ID. This data will be used by the online course instructor to help maintain a record of your performance on the assignments and activities of the course. Furthermore, the online course instructor and the lab instructor at this college will confer about your progress in the course, in order to assure your success in the course.

**7. Course Grade.** The online course instructor will submit the final grade earned in the online lecture portion of the course to the Insert name of Enrolling Institution registrar. The grade will be posted on your Insert name of Enrolling Institution transcript and used in the calculation of your GPA. Grade appeals for this course will be addressed to the online course instructor first and then to the Insert name of Enrolling Institution through its academic appeals process. Please note that the course grade used by the instructor may be translated to fit Insert name of Enrolling Institution's grading system.

#### **Agreement**

By registering for an FVCC online course, you have chosen to agree and accept the information provided above and to consent to the sharing of data and information as described above.

\_\_\_\_\_  
Student Name

\_\_\_\_\_  
Date





## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Da Dean [Signature] Date 1/29/12  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ECP 104

Course Title: Workplace Safety  
Credits: 1

Required by: Machinist Technician AAS  
Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: .5  
Contact hours lab: 1

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course incorporates the Related Instruction requirement for Interactions into the study of policies, compliance, enforcement, and reporting of work site safety issues. In addition, the American Red Cross Standards for First Aid and CPR training are presented to provide the skills necessary to efficiently respond to workplace emergencies. Coursework will focus on personal ability to act and interact ethically and effectively in both self-practice and co-worker enforcement of safety policies. The ethical responsibility to report safety violations and means of coping with accidents that involve the death of a team member or mass casualties within a workplace will also be studied. Students will employ hands-on practices to demonstrate skills in first aid and CPR. Real life scenarios will be presented to enable students in gaining an understanding of one's self and co-workers in relationship to responding, treating, and coping with workplace safety practices and medical emergencies.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Recognize one's personal strength and weakness in relationship to workplace safety and emergency care.
- Set goals and work in a self-directed manner to ensure a safe and efficient physical workplace.
- Demonstrate responsibility/accountability for personal actions/thoughts/emotions in responding to a work site emergency.
- Collaborate effectively with others in providing support medical treatment of mass casualties, including nature of injuries, treatment, and priority of evacuation.
- Demonstrate the interpersonal skills necessary to tactfully correct workplace safety violations by co-workers.
- Assess the moral issues and principles involved in reporting work site safety violations.
- Recognize that conflict is natural in the stages of grief associated to co-workers experiencing a death related to a workplace accident and demonstrate methods of successful conflict management.
- Recognize and then act using the skills needed in a situation requiring first aid and/or CPR.

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Don Dean [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: EELE 101

Course Title: Introduction to Electrical Fundamentals  
Credits: 2

Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 1  
Contact hours lab: 2

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This is an introductory course, in a lecture + lab format, in electrical fundamentals including Kirchhoff's Laws, power and energy in resistive circuits, use of meters and oscilloscopes, time-varying signals in electric circuits, inductors and capacitors, series and parallel resonance circuits, and digital circuits. The primary objective of this course is to introduce students, in a hands-on setting, to the proper use of basic electrical instruments, including multi-meters, DC power supplies, function generators, and oscilloscopes in the measurement, testing, construction, and analysis of basic electrical and electronic components, circuits, and devices.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Read and interpret basic electrical circuit diagrams.

- Identify and use in basic electrical circuits components such as resistors, capacitors, inductors, and diodes.
- Use ohmmeters, ammeters, voltmeters, multi-meters, signal generators, and oscilloscopes to make measurements of electrical quantities in a laboratory setting.
- Collect, analyze, and interpret experimental results and draw logical conclusions.
- Present experimental results in accepted written scientific form, including tables and graphics.
- Design basic circuits and experiments to test theoretical predictions by experiment.
- Demonstrate a working knowledge of accepted electrical laboratory procedures, methods, and safety practices.

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steven Don Dean [Signature] Date 1/29/16  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 100x  
  
Course Title: Introduction to Electricity  
Credits: 2  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 2  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This is an introductory class in electrical fundamentals. A practical approach will be used for the study of electricity including Ohm's Law; power; series and parallel circuits; direct and alternating current. A strong emphasis will be placed on diagrams and troubleshooting. Co-requisite: ELCT 100y.

**Course Outcome Objectives:**

- Upon successful completion of this course, the student should be able to:
- Understand and use Ohm's Law in practical situations
  - Understand series and parallel circuits
  - Solve problems using Kirchhoff's Laws
  - Read simple wiring diagrams
  - Demonstrate the use of test equipment to troubleshoot

- Read the National Electrical Code ampere capacity (ampacity) tables and apply them, with Ohm's and Kirchhoff's Laws, to determine proper wire sizes
- Describe the features associated with static electricity  
Understand alternating and direct current and how they are produced

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter: Steven Don Dean: [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 100y  
Course Title: Introduction to Electricity Lab  
Credits: 1  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture:  
Contact hours lab: 2

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This is an introductory class in electrical fundamentals. A practical approach will be used for the study of electricity including Ohm's Law; power; series and parallel circuits; direct and alternating current. A strong emphasis will be placed on diagrams and troubleshooting. Course Fee: \$35. Co-requisite: ELCT 100x.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand and use Ohm's Law in practical situations
- Understand series and parallel circuits
- Solve problems using Kirchhoff's Laws
- Read simple wiring diagrams
- Demonstrate the use of test equipment to troubleshoot

- Read the National Electrical Code ampere capacity (ampacity) tables and apply them, with Ohm's and Kirchhoff's Laws, to determine proper wire sizes
  - Describe the features associated with static electricity
- Understand alternating and direct current and how they are produced

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steven Dan Dean [Signature] Date 1/29/16  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 110x  
  
Course Title: Basic Electricity I  
Credits: 4  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 4  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will introduce the student to the various electrical properties and the equipment which produces those properties. Basic circuitry will be examined, utilizing algebraic skills to perform the calculations. Pre-requisite: ELCT 100x, ELCT 100y or consent of instructor. Co-requisite: ELCT 110y.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand and apply the first three chapters of the National Electrical Code
- Demonstrate an advanced understanding of Ohm's and Kirchhoff's Laws
- Demonstrate an understanding of electrical measuring instruments
- Understand magnetic induction, capacitive reactance and resistance, and their relevance in series and parallel circuits



- Use basic trigonometry and vector algebra in the solution of electrical problems

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Don Dean [Signature] Date 1/29/16  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS

Program Area: Electronics Technician

Date:

Course Prefix & No.: ELCT 110y

Course Title: Basic Electricity I Lab

Credits: 1

Required by: Electronics Technician AAS

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Gradable Lab:

Contact hours lecture:

Contact hours lab: 2

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will introduce the student to the various electrical properties and the equipment which produces those properties. Basic circuitry will be examined, utilizing algebraic skills to perform the calculations. Course Fee: \$50.00. Pre-requisite: ELCT 100x and ELCT 100y or consent of instructor. Co-requisite: ELCT 110x.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand and apply the first three chapters of the National Electrical Code
- Demonstrate an advanced understanding of Ohm's and Kirchhoff's Laws
- Demonstrate an understanding of electrical measuring instruments
- Understand magnetic induction, capacitive reactance and resistance, and their relevance in series and parallel circuits

- Use basic trigonometry and vector algebra in the solution of electrical problems

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steven Dem Dean [Signature] Date 1/29/16  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 137x  
Course Title: Electrical Drafting Lecture  
Credits: 1  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 1 per week  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will have students develop techniques of communicating through the use of mechanical drawings. Electrical drawings; heating; ventilation and air condition drawings. Basic blueprint reading and sketching are included.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand residential and some commercial blueprints and how to install a complete wiring system including an electrical service
- Produce a complete wiring system for residential and some commercial blueprints that do not ordinarily include such systems
- Identify and use the proper symbols on a blueprint
- Demonstrate how to translate the symbols on a blueprint to what must be done on an actual job

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steven Don Signature \_\_\_\_\_ Dean [Signature] Signature (indicates "college" level approval) \_\_\_\_\_ Date 1/29/12

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

**College:** COTS

**Program Area:** Electronics Technician

**Date:**

**Course Prefix & No.:** ELCT 137y

**Course Title:** Electrical Drafting Lab

**Credits:** 1

**Required by:** Electronics Technician AAS

**Selective in:**

**Elective in:**

**General Education:**

**Lecture:**

**Lecture/Lab:** X

**Gradable Lab:**

**Contact hours lecture:**

**Contact hours lab:** 2 per week

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will have students develop techniques of communicating through the use of mechanical drawings. Electrical drawings; heating; ventilation and air condition drawings. Basic blueprint reading and sketching are included.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand residential and some commercial blueprints and how to install a complete wiring system including an electrical service
- Produce a complete wiring system for residential and some commercial blueprints that do not ordinarily include such systems
- Identify and use the proper symbols on a blueprint
- Demonstrate how to translate the symbols on a blueprint to what must be done on an actual job

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steve Dem Dean [Signature] Date 1/29/10  
Signature Signature (indicates college level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS

Program Area: Electronics Technician

Date:

Course Prefix & No.: ELCT 102x

Course Title: Electrical Fundamentals II - Lecture

Credits: 3

Required by: Electronics Technician AAS

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Gradable Lab:

Contact hours lecture: 3 per week

Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will introduce the student to alternating current. The electrical properties and their effects on the circuit will be examined. Basic trigonometric skills will be utilized to perform calculations for analyzing various electrical circuits. Pre-requisite: ELCT 110x, ELCT 110y, BMGT 205c and M 114

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand residential and some commercial blueprints and how to install a complete wiring system including an electrical service
- Produce a complete wiring system for residential and some commercial blueprints that do not ordinarily include such systems
- Identify and use the proper symbols on a blueprint
- Demonstrate how to translate the symbols on a blueprint to what must be done on an actual job

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Don Dean [Signature] Date 2/29/16  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS

Program Area: Electronics Technician

Date:

Course Prefix & No.: ELCT 102y

Course Title: Electrical Fundamentals II - Lab

Credits: 1

Required by: Electronics Technician AAS

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Gradable Lab:

Contact hours lecture: 2 per week

Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will introduce the student to alternating current. The electrical properties and their effects on the circuit will be examined. Basic trigonometric skills will be utilized to perform calculations for analyzing various electrical circuits. Pre-requisite: ELCT 110x, ELCT 110y, BMGT 205c and M 114

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Understand residential and some commercial blueprints and how to install a complete wiring system including an electrical service
- Produce a complete wiring system for residential and some commercial blueprints that do not ordinarily include such systems
- Identify and use the proper symbols on a blueprint
- Demonstrate how to translate the symbols on a blueprint to what must be done on an actual job

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steven Don Dean [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

**College:** COTS  
**Program Area:** Electronics Technician  
**Date:**  
**Course Prefix & No.:** ELEC 111  
**Course Title:** Electric Meters & Motors  
**Credits:** 3  
**Required by:** Electronics Technician AAS

**Selective in:**

**Elective in:**

**General Education:**

**Lecture:**

**Lecture/Lab:** X

**Gradable Lab:**

**Contact hours lecture:** 1 per week

**Contact hours lab:** 4 per week

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course is a practical hands-on course using ammeters, voltmeters, watt meters, and multi-meters in testing and troubleshooting electric motors, components and wiring systems. This course includes a study of single and three-phase AC motors, their construction features and operating characteristics. This lecture/lab class emphasizes electric motor terminology, identification of motor types, enclosures, mounts, motor selection, connections, maintenance, testing and troubleshooting. Students are also introduced to motor loads, protection, controls, and devices used to connect motors to their loads such as pulleys, V-belts, gear boxes and couplings

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

**Course Outcome Objectives:**

The student will become:

- Proficient in the use of basic hand-held electrical test equipment including
  - Ammeters
  - Voltmeters
  - Multimeters

- Wattmeters
- Familiar with basic electrical rotating machinery including
  - Electric motors
  - Generators
  - Protective switching equipment
  - Thermal overloads
  - Magnetic motor starters
- Familiar with both single and three-phase electrical circuits including motors, switching equipment, electrical protection equipment and circuit fault interrupter circuits.
- Able to identify the various types of electric motors, starters and control circuits.
- Familiar with typical mechanical components of electric motor installations including
  - Fans
  - pulleys
  - V-belts
  - Gears
  - Mounting hardware
  - Conductor sizing
  - Overload sizing
  - Overcurrent protection sizing

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter: Steven Don Dean: [Signature] Date 1/29/12  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 130x

Course Title: Panel Wiring and Soldering - lecture  
Credits: 0.8

Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 1 per week  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will introduce the student to the physical assembly and wiring of electrical/industrial control panels. The course will teach the fundamentals of torque and soldered connections for complete installation of wires, cables, and components. The basics of electrical schematics and wiring diagrams will be taught in relation to wiring control panels.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

**Course Outcome Objectives:**

- Read electrical schematics and wiring diagrams used in control panel fabrication
- Apply solder at the correct melting temperature and amount by using color visual techniques to assure a quality electrical connection
- Lay down and terminate electrical control wiring in a logical and clean presentation
- Terminate electrical control wiring with the proper amount of torque for safety and reliability

- Understand how to resistance check each soldered or pressured termination
- Perform proper cleaning techniques on soldering tools
- Identify ergonomic position and posture for all-day assembly work
- Use wire identification and labelling tools

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steven Don Dean [Signature] Date 1/29/16  
Signature (indicates "college"-level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 130y

Course Title: Panel Wiring and Soldering - lab  
Credits: 1.2

Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture:  
Contact hours lab: 3 per week

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will introduce the student to the physical assembly and wiring of electrical/industrial control panels. The course will teach the fundamentals of torque and soldered connections for compliant installation of wires, cables, and components. The basics of electrical schematics and wiring diagrams will be taught in relation to wiring control panels.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Read electrical schematics and wiring diagrams used in control panel fabrication
- Apply solder at the correct melting temperature and amount by using color visual techniques to assure a quality electrical connection
- Lay down and terminate electrical control wiring in a logical and clean presentation
- Terminate electrical control wiring with the proper amount of torque for safety and reliability

- Understand how to resistance check each soldered or pressured termination
- Perform proper cleaning techniques on soldering tools
- Identify ergonomic position and posture for all-day assembly work
- Use wire identification and labeling tools

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Dem Dean [Signature] Date 1/29/16  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 245x  
  
Course Title: Digital Electronics  
Credits: 3  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 3  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course explores digital electronic circuits and devices that make up a computer system. Topics include binary and hexadecimal number systems, Boolean algebra and digital logic theory, simple logic circuits, combinatorial logic, and sequential logic. Analog-to-digital and digital-to-analog interfaces are covered. Includes lab exercises. Pre-requisite: ELCT 110x and ELCT 110y. Co-requisite: ETEC 245y.

**Course Outcome Objectives:**

Upon successful completion of this course, the student should be able to:

- Identify analog and digital electrical signals
- Convert among decimal, binary, octal, and hexadecimal number systems
- Explain the operation of digital logic gates
- Use Boolean algebra to express logic operations as equations



- Identify and explain combinatorial, sequential, and other logic circuits
- Name and describe the function of various data conversion devices
- Troubleshoot digital circuits using standard and specialized test equipment

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Don Dean [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 245y  
  
Course Title: Digital Electronics Lab  
Credits: 1  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture:  
Contact hours lab: 2

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course explores digital electronic circuits and devices that make up a computer system. Topics include binary and hexadecimal number systems, Boolean algebra and digital logic theory, simple logic circuits, combinatorial logic, and sequential logic. Analog-to-digital and digital-to-analog interfaces are covered. Includes lab exercises. Course Fee: \$50. Pre-requisite: ELCT 110x and ELCT 110y. Co-requisite: ETEC 245x.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Identify analog and digital electrical signals
- Convert among decimal, binary, octal, and hexadecimal number systems
- Explain the operation of digital logic gates
- Use Boolean algebra to express logic operations as equations

- Identify and explain combinatorial, sequential, and other logic circuits
- Name and describe the function of various data conversion devices
- Troubleshoot digital circuits using standard and specialized test equipment

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steven Don Dean [Signature] Date 1/29/16  
Signature (indicates college level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 250x  
  
Course Title: Solid State Electronics  
Credits: 1  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 1  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This is an introduction to semiconductor technologies used in solid state electronics with an emphasis on diodes and transistors. Lab exercises reinforce and illustrate lecture topics. Prerequisite: ELCT 110x and ELCT 110y. Co-requisite: 250y.

**Course Outcome Objectives:**

Upon successful completion of this course, the student should be able to:

- Describe semiconductors and how current is produced in a semiconductor
- Describe n-type and p-type semiconductors and a pn junction
- Explain and analyze diode circuits with applications
- Describe the characteristics of bipolar junction transistors and analyze their operation
- Describe and analyze the operation of different types of amplifiers

- Determine the dc operating point of a linear amplifier
- Analyze transistor bias circuits
- Describe JFET and MOSFET transistors and their circuits

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Don Dean [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 250y  
  
Course Title: Solid State Electronics Lab  
Credits: 3  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture:  
Contact hours lab: 6

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This is an introduction to semiconductor technologies used in solid state electronics with an emphasis on diodes and transistors. Lab exercises reinforce and illustrate lecture topics. Course Fee: \$50. Pre-requisites: ELCT 110x and ELCT 110y. Co-requisites: ETEC 250x.

**Course Outcome Objectives:**

Upon successful completion of this course, the student should be able to:

- Describe semiconductors and how current is produced in a semiconductor
- Describe n-type and p-type semiconductors and a pn junction
- Explain and analyze diode circuits with applications
- Describe the characteristics of bipolar junction transistors and analyze their operation
- Describe and analyze the operation of different types of amplifiers

- Determine the dc operating point of a linear amplifier
- Analyze transistor bias circuits
- Describe JFET and MOSFET transistors and their circuits

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steven Don Dean [Signature] Date 1/29/16  
Signature (indicates college level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 210x  
  
Course Title: Advanced Current Theory  
Credits: 4  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 4  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course is a study of three phase alternating current circuits and single and three phase transformers and machines. The theory and operation of three phase wye and delta circuits and the relationship of voltage, current and power in these circuits. The use of phasor algebra in the solution of alternating current problems is stressed as are the characteristics and use of electrical instruments such as voltmeters, ammeters, ohmmeters, and watt meters. Students learn the theory and operation of transformers with single and three phase connections and are introduced to alternating current machines. Pre-requisites: ELCT 102x and ELCT 102y. Co-requisites: ELCT 210y.

**Course Outcome Objectives:**

Upon successful completion of this course, the student should be able to:

- Synthesize the theory and operation of three phase wye and delta circuits and the relationship of voltage, current and power in these circuits.
- Employ the use of phasor algebra in calculating the solution of alternating current problems.
- Safely and accurately employ electrical instruments such as voltmeters, ammeters, ohmmeters, and watt meters in relationship to electrical exercises.
- Synthesize the theory and operation of transformers with single and three phase connections and alternating current machines.

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Don Dean [Signature] Date 6/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 210y  
  
Course Title: Advanced Current Theory Lab  
Credits: 1  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture:  
Contact hours lab: 2

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course is a study of three phase alternating current circuits and single and three phase transformers and machines. The theory and operation of three phase wye and delta circuits and the relationship of voltage, current and power in these circuits. The use of phasor algebra in the solution of alternating current problems is stressed as are the characteristics and use of electrical instruments such as voltmeters, ammeters, ohmmeters, and watt meters. Students learn the theory and operation of transformers with single and three phase connections and are introduced to alternating current machines. Course Fee: \$35. Pre-requisites: ELCT 102x and ELCT 102y. Co-requisites: ELCT 210x.

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Synthesize the theory and operation of three phase wye and delta circuits and the relationship of voltage, current and power in these circuits.
- Employ the use of phasor algebra in calculating the solution of alternating current problems.
- Safely and accurately employ electrical instruments such as voltmeters, ammeters, ohmmeters, and watt meters in relationship to electrical exercises.
- Synthesize the theory and operation of transformers with single and three phase connections and alternating current machines.

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steven Don Dean [Signature] Date 1/29/11  
Signature Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 280  
  
Course Title: Advanced Electronics  
Credits: 4  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 4  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course will involve the study of how various industrial processes are coalesced using advanced PLC techniques. The course will illustrate the use of electrical, electronic solid state, digital, and pneumatic transmitters in practical process control instrumentation. There will be an emphasis on application of principles. Prerequisites: ETEC 245, ETEC 250. Course Fee: \$25

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Describe how various industrial processes are coalesced using advanced PLC techniques
- Demonstrate the use of electrical, electronic solid state, digital, and pneumatic transmitters in practical process control instrumentation
- Implement process control principles including linear and derivative process control

- Successfully use techniques to trouble shoot electromechanical and solid state problems

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steve Don Dean [Signature] Date 1/29/16  
Signature (Indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 285  
  
Course Title: Advanced Programmable Controllers  
Credits: 3  
  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 3  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This is an advanced course in programmable controllers that emphasizes programming circuits using relay type instructions, timers, counters, data manipulation, arithmetic functions, and other advanced techniques. Prerequisites: ELCT 250. Course Fee: \$50

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Demonstrate the ability to program a variety of timers
- Operate analog input/output devices
- Apply programmable controller networking basics
- Install and configure PLC programming software
- Program a human machine interface (HMI) used in machine control

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05



## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_

Submitter Steve Dem Dean [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ELCT 211

Course Title: AC Measurements  
Credits: 3

Required by: Electronics Technician AAS

Selective in:

Elective in:

General Education:

Lecture:

Lecture/Lab: X

Gradable Lab:

Contact hours lecture: 2

Contact hours lab: 2

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This lecture/lab course consists of a series of experiments to investigate the characteristics of single-phase and three-phase electrical circuits. The connections and testing of transformers in both single-phase and three-phase configurations are stressed. Students also learn the operation of three phase motors from conventional sources and phase converters, with an emphasis on efficiency, operating characteristics and connections. Pre-requisite ELCT 102

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Synthesize the theory and operation of three phase wye and delta circuits and the relationship of voltage, current and power in these circuits.
- Employ the use of phasor algebra in calculating the solution of alternating current problems.

- Safely and accurately employ electrical instruments such as voltmeters, ammeters, ohmmeters, and watt meters in relationship to electrical exercises.
- Synthesize the theory and operation of transformers with single and three phase connections and alternating current machines.

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05

## COURSE REVISION FORM

NEW X DROPPED \_\_\_\_\_ MAJOR REVISION \_\_\_\_\_ FOR INFORMATION ONLY \_\_\_\_\_

College COTS Program Area Electronics Technician Date \_\_\_\_\_  
Submitter Steve Don Dean [Signature] Date 1/29/16  
Signature (indicates "college" level approval)

Please provide a brief explanation & rationale for the proposed revision(s): As a part of the course-sharing arrangement with FVCC this is a new course for the Electronics Technician AAS degree.

Please provide the following information:

College: COTS  
Program Area: Electronics Technician  
Date:  
Course Prefix & No.: ETEC 299  
Course Title: Capstone: Electronics  
Credits: 3  
Required by: Electronics Technician AAS

Selective in:  
Elective in:  
General Education:

Lecture:  
Lecture/Lab: X  
Gradable Lab:  
Contact hours lecture: 3  
Contact hours lab:

**Current Catalog Description (include all prerequisites):**

**Proposed or New Catalog Description (include all prerequisites):**

This course provides opportunities for the student to arrange to complete special projects using knowledge gained in previous course work. All projects must be approved by the instructor.

Prerequisites: Enrollment in Electronics Technician Level IV. Course Fee: \$50

**Course Outcome Objectives:**

**Upon successful completion of this course, the student should be able to:**

- Use knowledge gained from the program to identify an appropriate project
- Produce all necessary paperwork and documentation for the project
- Synthesize knowledge gained from the program to complete the project
- Communicate the results in a written and/or oral report

**Additional instructional resources needed (including library materials, special equipment, and facilities). Please note: approval does not indicate support for new faculty or additional resources.**

Updated 09/29/05