

Formal Evaluation and Subject Matter Expert Summary Report



Maine is IT!
INFORMATION TECHNOLOGY
A CONSORTIUM OF MAINE'S SEVEN COMMUNITY COLLEGES

ETC225

*Submitted to Maine is IT in fulfillment of the
TAACCCT grant requirements*

*By
Emporia State University*

EMPORIA STATE
UNIVERSITY
■ INFORMATION TECHNOLOGY

February 2017

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties or assurances of any kind, express or implied, with respect to such information on linked sites, and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

Developed by Anna J. Catterson, Ph.D., Emporia State University.

Course Review for: Maine is IT
Course: ETC225: Analog Circuits
Reviewed by: Anna J. Catterson, Ph.D.
Date: February 5, 2017

Part 1: Course Review

A. Course Review & Introduction (16 points total)		
1.1 Instructions made clear how to get started and where to find various course components.	3	1
1.2 Learners are introduced to the purpose and structure of the course.	3	2
1.3 Etiquette expectations (sometimes called “netiquette”) for online discussions, email, and other forms of communication are clearly stated.	2	0
1.4 Course and or institutional policies with which the learner is expected to comply are clearly stated, or a link to current policies is provided.	2	2
1.5 Minimum technology requirements are clearly stated and instructions for use provided.	2	0
1.6 Prerequisite knowledge in the discipline and/or any required competencies are clearly stated.	1	1
1.7 Minimum technical skills expected of the learner are clearly stated.	1	0
1.8 The self-introduction by the instructor is appropriate and is available online.	1	0
1.9 Learners are asked to introduce themselves to the class.	1	0
Total		6

Comments:

1.1: Reviewer did not find any instruction on how to get started in the course, however it was noted that communication is via Blackboard and students are responsible for checking. Various course links provided to the Pearson text book. One link listed under “Lectures”, is broken: "<http://www.eta-i.org/electronics.html#CETa>". Reviewer suggests revising.

1.2: The purpose and course description was clearly documented. There was a small table that was hard to follow for the Course Outline. Reviewer recommends including dates or modules to each topic in order for readability. The reviewer was not sure what order the topics were in.

1.3: Etiquette expectations (sometimes called “netiquette”) for online discussions, email, and other forms of communication should be covered. Reviewer did not find any mention of “netiquette” and examples that could be included are as follows:

- Be sensitive to the fact that there will be cultural and linguistic backgrounds, as well as different political and religious beliefs, plus just differences in general.
- Use good taste when composing your responses in Discussion Forums. Swearing and profanity is also part of being sensitive to your classmates and should be avoided. Also consider that slang can be misunderstood or misinterpreted.
- Don’t use all capital letters when composing your responses as this is considered “shouting” on the Internet and is regarded as impolite or aggressive. It can also be stressful on the eye when trying to read your message.
- Be respectful of your others’ views and opinions. Avoid “flaming” (publicly attacking or insulting) them as this can cause hurt feelings and decrease the chances of getting all different types of points of view.
- Be careful when using acronyms. If you use an acronym it is best to spell out its meaning first, then put the acronym in parentheses afterward, for example: Frequently Asked Questions (FAQs). After that you can use the acronym freely throughout your message.
- Use good grammar and spelling, and avoid using text messaging shortcuts.

1.4: Course and institutional policies were covered in the syllabus. All links were correct and working at the time of this review. It is suggested to insert the phone number and email address where it is documented [insert phone], [insert email]. Replace the template with the updated information.

Note: This is an on-ground course. The Attendance Policy was introduced, but no parameters as to how absenteeism would affect a student's grade was discussed other than to indicate it could impact employer references. A stronger attendance policy might help reduce potential ambiguity. Also, consider including the last day to withdrawal and the last day for a refund. This can help students understand their responsibility.

1.5: Technology requirements were not stated in the syllabus however, supplies were stated. Reviewer suggests adding a section specifically for technology requirements. What type of computer, internet, browser and/or software is needed? Pearson textbook requires Flash and JavaScript, good information to include since the textbook publisher sister site is being used.

1.6: ETC125 Semiconductor Devices; prerequisite identified.

1.7: No technical skills were identified of students.

1.8: Difficult to ascertain because access to the Blackboard course was not provided. The instructor's contact information is not indicated in the syllabus, please consider updating.

1.9: Difficult to ascertain because access to the Blackboard course was not provided. The Reviewer recommends adding an introduction activity in the syllabus.

B. Learning Objectives & Competencies (15 points total)		
2.1 The course learning objectives, or course/program competencies, describe outcomes that are measurable	3	3
2.2 The module/unit learning objectives or competencies describe outcomes that are measurable and consistent with the course-level objectives or competencies.	3	2
2.3 All learning objectives and competencies are stated clearly and written from the learner's perspective.	3	3
2.4 The relationship between learning objectives or competencies and course activities is clearly stated.	3	2
2.5 The learning objectives or competencies are suited to the level of the course.	3	3
Total		13
Comments:		
<p>2.1: There are numerous course objectives that are clearly expressed and measurable. Each learning objective should be cross referenced to the learning activities in the course. Creating a numbered list and then referencing each numbered item for each assignment/activity would be helpful for assessment purposes.</p> <p>2.2: The syllabus describes learning objectives using measurable language and verbs. Consider mapping these course-level learning objectives and activities to the overall program outcomes/competencies. Those would be the outcomes required for accreditation. (See 2.1)</p> <p>2.3: The course learning objectives clearly state what the learner is to accomplish by the end of the course.</p> <p>2.4: The Reviewer noted an association between learning objectives and the course outline. The Reviewer recommends strengthening this association/crosswalk using more robust language to define the linkage between objectives and individual course activities. A general overview of projects and activities was indicated, but more detailed information relative to these course tasks would strengthen the syllabus.</p> <p>2.5: Yes, the reviewer noted the complexity of the syllabus as well as the intensity and finds it to suit the level of the suit.</p>		

C. Assessment & Measurement (13 points total)

3.1 The assessments measure the stated learning objectives or competencies.	3	2
3.2 The course grading policy is stated clearly.	3	3
3.3 Specific and descriptive criteria are provided for the evaluation of learners' work and are tied to the course grading policy.	3	2
3.4 The assessment instruments selected are sequenced, varied, and suited to the learner work being assessed.	2	1
3.5 The course provides learners with multiple opportunities to track their learning progress.	2	1
Total		9

Comments:

3.1: Difficult to ascertain from the syllabus alone, however, four exams worth 40% of the grand and one assignment worth 10% of the grade was noted. The lab projects were half of the grade and due to the intensity and volume of these assessment, a final is not given.

3.2: The grading policy/rubric is stated in the syllabus.

3.3: The Reviewer found some descriptive criteria associated with the grading policy. However, this could be strengthened. This could be improved by stating the feedback policy (how often, how much time will it take the instructor to review and respond?). Including these details will strengthen the grading policy.

3.4: There was a high-level description of assessments (eg Lab Projects and Assignments). The Reviewer would have preferred a more detailed breakdown of the quizzes and assessments relative to each week/module/unit with course objective alignment clearly indicated. Due dates would have been preferred.

3.5: Reviewer couldn't locate any evidence of tracking learning progress. (e.g., Circle back activities, mastery learning pathways, etc.) However, course activities appear to build on one another - providing scaffolding. How will students be alerted of their progress and IF a student were to fail one unit, is remedial work considered?

D. Instructional Materials (13 points total)

4.1 The instructional materials contribute to the achievement of the stated course and module/unit learning objectives or competencies.	3	3
4.2 Both the purpose of instructional materials and how the materials are to be used for learning activities are clearly explained.	3	2
4.3 All instructional materials used in the course are appropriately cited.	2	2
4.4 The instructional materials are current.	2	2
4.5 A variety of instructional materials is used in the course.	2	2
4.6 The distinction between required and optional materials is clearly explained.	1	1
Total		12

Comments:

4.1: The instructional materials align with the course and unit objectives stated in the syllabus. The textbook from Pearson is a good reference; current and fits the scope of the course. Is there OER materials that could be referenced? The textbook is a hefty price of \$133.00; would like to see instructor content to go along with this OR a more affordable option for community college students. The Pearson website offers some course helps and guides for students, this is a good aid.

4.2: The purpose of the instructional materials in the course is implied. The Reviewer would have liked to see stronger alignment between the text and resources with the required activities.

4.3: The instructional materials were not properly cited, include a bibliography of resources used. Creative Commons attribution noted.

4.4: The instructional materials are current.

4.5: The instructional materials vary by unit and assignment.

4.6: Optional materials are not part of this course.

E. Course Activities and Learner Interaction (11 points total)

5.1 The learning activities promote the achievement of the stated learning objectives or competencies.	3	2
5.2 Learning activities provide opportunities for interaction that support active learning.	3	3
5.3 The instructor's plan for classroom response time and feedback on assignments is clearly stated.	3	0
5.4 The requirements for learner interaction are clearly stated.	2	0
Total		5

Comments:

5.1: The learning activities appear to directly support the course/unit learning objectives.

5.2: There are opportunities for interactive learning. This is a theory/lab course with significant opportunity for students to gain knowledge through hands-on activities.

5.3: A plan for feedback is not specified in the syllabus.

5.4: Requirements for expected learner interaction are not clearly specified.

F. Course Technology (10 points total)

6.1 The tools used in the course support the learning objectives and competencies.	3	2
6.2 Course tools promote learner engagement and active learning.	3	3
6.3 Technologies required in the course are readily obtainable.	2	1
6.4 The course technologies are current.	1	1
6.5 Links are provided to privacy policies for all external tools required in the course.	1	0
Total		7

Comments:

6.1: The tools in the course appear to support the learning objectives. Links to user manuals relating to the supply list is recommended.

6.2: The tools promote engagement and active learning. The assignments promote active student engagement by requiring interaction with the technology to build content for assignments.

6.3: The supplies are required to be purchased by the student and are obtainable through the bookstore and through Electronix Express. The reviewer recommends including a link to the website (<http://www.elexp.com/>) and indicating the costs for the additional supplies.

6.4: The course technologies are current and up-to-date for the required work.

6.5: Certain policies (eg, ADA, Codes of Conduct, etc.) are provided via extracted policy wording. However, the Reviewer was unable to locate links to privacy policies (eg, HIPAA, FERPA, etc.) Consider including that language in the course syllabus.

G. Learner Support (9 points total)

7.1 The course instructions articulate or link to a clear description of the technical support offered and how to obtain it.	3	0
7.2 Course instructions articulate or link to the institution's accessibility policies and services.	3	2
7.3 Course instructions articulate or link to an explanation of how the institution's academic support services and resources can help learners succeed in the course and how learners can obtain them.	2	0
7.4 Course instructions articulate or link to an explanation of how the institution's student support services and resources can help learners succeed in the course and how learners can obtain them.	1	0
Total		2

Comments:

7.1: Providing students access to technology support is very important. Don't assume that students know how to obtain support from the institution. Provide instructions/links for students to access the technology help services available to them.

7.2: The syllabus contains an excerpt from the institution website pertaining to accessibility.

7.3: Access to the institutional academic support services is critical. Consider providing instructions/links to tutoring and other academic support services.

7.4: As with academic support, student wellness and support is also critical. Consider providing instructions/links to the institutional student support services. These might include tutoring services, the Writing Center, Technical Support, etc.

H. Accessibility and Usability (12 points total)

8.1 Course navigation facilitates ease of use.	3	3
8.2 Information is provided about the accessibility of all technologies required in the course.	3	2
8.3 The course provides alternative means of access to course materials in formats that meet the needs of diverse learners.	2	2
8.4 The course design facilitates readability.	2	2
8.5 Course multimedia facilitate ease of use.	2	2
<i>Total</i>		11

Comments:

8.1: Implied. The Reviewer did not have access to the Blackboard course.

8.2: This could be strengthened to include information specific to students with physical or learning disabilities.

8.3: Implied. The Reviewer did not have access to the Blackboard course. The Americans with Disabilities Act requires institutions to make accommodations for student who identify as having a disability. Work closely with your institution's office for disability services to identify resources to assist in making your course ADA compliant. The Reviewer assumes this has been considered.

The Pearson supplemental website is accessible and can be read on a screen reader. Consider making the course syllabus ADA compliant as well (no bold, use Strong, no italics, use emphasis, use tables, etc.)

8.4: Implied. The Reviewer did not have access to the Blackboard course. Consider processing this course through an ADA checker. Webaim is one such option. <http://wave.webaim.org>

8.5: Implied. The Reviewer did not have access to the Blackboard course. Ensure content, such as videos, are easy accessed and include either 1) captioning and/or 2) a transcript.

Part II: Employment Data

Stakeholder Involvement and Employment Opportunities

Items Reviewed include:

- Internships, Job Shadowing Opportunities that exist with the outcomes and objectives with this course.
- Employment opportunities for these skills.
- Outcomes/Objectives are current and relate to job market.

Findings include:

- See Subject Matter Expert review for specific feedback relative to this finding.

Part III: Creative Commons

Items Reviewed include:

- All course materials presented in Creative Commons?
- Creative Common license (including graphic) is represented on course materials.

Findings include:

- This material is licensed under the Creative Commons Attribution 4.0 International License.
- Creative Commons graphic is included on the footer.

Part IV: Subject Matter Expert (SME) Findings & Review

Course: ETC 225
Course Name: Analog Circuits
Date: February 8th, 2017

Background

Funded by a \$13 million grant from the U.S. Department of Labor, *Maine is IT!* is building new educational and career pathways in information technology at all seven of Maine's community colleges. The programs funded by the grant are designed to support Maine workers eligible for the Trade Adjustment Assistance (TAA) program, un/underemployed adults, and workforce needs in Maine's growing IT sector. They have been built to serve individuals with a range of experience, from those interested in gaining basic IT skills to IT professionals looking to advance their careers through new industry certifications.

Overall Remarks and Reviewer Summary

In reviewing ETC 225 several processes and data collections tools were noted and identified. This reviewer took in account the Dynamic Skills Audit conducted in 2014-2015. Both qualitative and quantitative data was identified in the report that provides the key elements:

1. Career opportunities do exist in for graduates from an AAS in Information Technology or those completing a certificate program. It was also found by this reviewer that the skills mastered in ETC 225 relate to specific job openings.
2. Current job openings list specific duties that relate to ETC 225.
3. The current Advisory Board indicates ETC 225 contributes to the labor market data.

The Dynamic Skills Audit outlined the following process, which this reviewer took into consideration when compiling this the formal SME report:

1. Local industry needs were assessed through the program Advisory Board. Minutes from those Advisory Board meetings were reviewed and suggestions from the partnerships were adopted into this summary.
2. Burning Glass data was reviewed to identify themes and trends in the current job market. The Burning Glass report helped identify skills demanded by employers to curriculum outcomes and learning objectives.

A formal SME was conducted with the above reports and compiled in the next section of this report.

A. Program and Course Overview and Objectives

Items Reviewed include:

- Dynamic Skills Audit Summary Report (Academic Years 2014-2015)
- Burning Glass Labor Market Data reports (Compilation)
- Advisory Board Minutes

Findings include:

The ETC 225 course learning outcomes and objectives align with the program mission and goals. This reviewer found that the ETC 225 course has listed measurable outcomes which can be stacked and latticed. The industry sector for ETC 225 has been categorized as: *334111 Electronic Computer Manufacturing* (See: <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=334111&search=2017%20NAICS%20Search>). This U.S. industry comprises establishments primarily engaged in manufacturing and/or assembling electronic computers, such as mainframes, personal computers, workstations, laptops, and computer servers. Computers can be analog, digital, or hybrid. Digital computers, the most common type, are devices that do all of the following: (1) store the processing program or programs and the data immediately necessary for the execution of the program; (2) can be freely programmed in accordance with the requirements of the user; (3) perform arithmetical computations specified by the user; and (4) execute, without human intervention, a processing program that requires the computer to modify its execution by logical decision during the processing run. Analog computers are capable of simulating mathematical models and contain at least analog, control, and programming elements. The manufacture of computers includes the assembly or integration of processors, coprocessors, memory, storage, and input/output devices into a user-programmable final product.

Cross-References. Establishments primarily engaged in--

- Manufacturing digital telecommunications switches, and local area network and wide area network communication equipment, such as bridges, routers, and gateways--are classified in Industry [334210](#), Telephone Apparatus Manufacturing;
- Manufacturing blank magnetic and optical recording media--are classified in U.S. Industry [334613](#), Blank Magnetic and Optical Recording Media Manufacturing;
- Manufacturing machinery or equipment that incorporates electronic computers for operation or control purposes and embedded control applications--are classified in the Manufacturing sector based on the classification of the complete machinery or equipment;
- Manufacturing internal, loaded, printed circuit board devices, such as sound, video, controller, and network interface cards; internal and external computer modems; and solid-state storage devices for computers--are classified in Industry [33441](#), Semiconductor and Other Electronic Component Manufacturing;
- Manufacturing other parts, such as casings, stampings, cable sets, and switches, for computers--are classified in the Manufacturing sector based on their associated production processes; and
- Retailing computers with on-site assembly--are classified in U.S. Industry [443142](#), Electronics Stores.

Those completing this course would enter the Bureau of Labor Statistics occupation classification of *SOC:15-1199 Computer Occupations, All Other. All computer occupations not listed separately. Excludes "Computer and Information Systems Managers" (11-3021), "Computer Hardware Engineers" (17-2061), "Electrical and Electronics Engineers" (17-2070), "Computer Science Teachers, Postsecondary" (25-1021), "Multimedia Artists and Animators" (27-1014), "Graphic Designers" (27-1024), "Computer Operators" (43-9011), and "Computer, Automated Teller, and Office Machine Repairs" (49-2011).*

Course objectives include:

1. Common Emitter Amplifier Circuits

- Calculate and measure the DC biasing of a common emitter amplifier.
- Calculate and measure the voltage gain (A_v) for a common emitter linear amplifier.
- Perform a DC and AC load line analysis for a common emitter linear amplifier.
- Determine the maximum output voltage for a common emitter linear amplifier.
- Compare calculated to measured CE amplifier circuit parameters.

2. Amplifier Input-Output Impedance

- Test, measure and calculate the input impedance to a common emitter amplifier.
- Test, measure and calculate the output impedance to a common emitter amplifier.
- Compare calculated to measured input and output amplifier circuit parameters.

3. Amplifier Swamping

- Use negative feedback to control gain stability and mid-range gain.
- Use negative feedback to swamp the non-linear effects of r'_e .
- Use negative feedback to determine input impedance.
- Use negative feedback to control large signal distortion.
- Compare calculated to measured amplifier swamping circuit parameters.

4. Amplifier Frequency Response

- Determine the frequency response of a common emitter (CE) amplifier by frequency sweeping and by phase shift measurements.
- Determine lower cutoff frequency ($f_{c \text{ lower}}$) and the upper cutoff frequency ($f_{c \text{ upper}}$) of the common emitter amplifier.
- Determine the bandwidth of a common emitter amplifier circuit.
- Perform a Bode Plot response of a common emitter amplifier circuit.
- Compare calculated to measured amplifier frequency response parameters.

5. Linear Amplifier Design

- Design a single stage common emitter linear amplifier from supplied specifications.
- Build a common emitter amplifier from designed parameters.
- Conduct a DC and AC analysis for the designed amplifier circuit.
- Perform measurements to verify the requested parameters called for in the design, such as; voltage gain, input impedance, frequency response, and bandwidth.
- Troubleshoot as needed a non-operational common emitter amplifier circuit.
- Compare design calculations to measured CE amplifier parameters.

6. Multistage Amplifiers

- Calculate and measure the DC parameters of a multistage CE amplifier circuit.
- Calculate and measure the AC parameters of a multistage CE amplifier circuit.
- Calculate and measure the gain parameters of a multistage CE amplifier circuit.
- Compare calculate versus measured voltage gain of multistage CE amplifier circuit.

7. Common Collector Amplifiers

- Calculate and measure the DC biasing of a CC amplifier.
- Calculate and measure the voltage and current gain for the CC amplifier.
- Perform a DC and AC load line analysis for a CC amplifier.
- Calculate and measure the input and output impedances for the CC amplifier.
- Determine the maximum output voltage for a CC amplifier.

8. Multistage Amplifier Applications

- Calculate and measure the DC biasing of a two stage CE / CC amplifier.
- Calculate and measure the voltage gain of a two stage CE / CC amplifier.
- Observe the effects of changing amplitude and frequency on a two stage CE / CC amplifier.
- Demonstrate the transformation of a high impedance source into a low impedance load.
- Compare calculated to measured CE amplifier circuit parameters.

9. Push-Pull Power Amplifiers

- Build, test and measure a Class B Push-Pull Amplifier.
- Build, test and measure a Class AB Push-Pull Amplifier.
- Measure the gain parameters of a Class AB push-pull amplifier.
- Calculate power efficiency of a push-pull amplifier.
- Compare calculated to measured push-pull amplifier circuit parameters.

10. Audio Power Amplifiers

- Measure the AC parameters of a Darlington pair push-pull audio power amplifier.
- Measure the true power of the Darlington pair push-pull power amplifier.
- Measure the peak power of the Darlington pair push-pull power amplifier.
- Build, test and measure an audio power amplifier circuit.

11. Tuned Frequency Amplifiers

- Build, test and measure the resonant frequency of a tuned amplifier circuit.
- Build, test and measure the voltage gain of a tuned amplifier circuit.
- Determine the cutoff points and bandwidth of a tuned amplifier circuit.
- Test and Measure the results by varying values of inductors and capacitors of a tuned amplifier circuit.

12. The Colpitts Oscillator

- Build, test and measure a Class C Colpitts Oscillator circuit.
- Measure the output voltage of a Class C Colpitts Oscillator circuit.
- Calculate and measure the frequency a Class C Colpitts Oscillator circuit using different values of L and C.

13. Operational Amplifiers

14. Build, test and measure the op-amp configured in common mode rejection.
- Build, test, measure and calculate the op-amp as an inverting amplifier.
 - Build, test, measure and calculate the op-amp as a non-inverting amplifier.
 - Observe the operating principles related to the op-amp as a comparator.
 - Build, test and measure an op-amp circuit configured as a comparator.
 - Build, test and measure an op-amp circuit configured as a temperature sensor.
 - Build, test and measure an op-amp circuit configured as a light detector.
 - Configure the op-amp as a summing amplifier.
 - Configure the op-amp as a differential (difference) amplifier.
 - Calculate, test and measure the op-amp as a common mode rejection amplifier.
 - Built, test and measure a common mode rejection op-amp circuit application.

These course objectives have been aligned to the course outline; the reviewer finds a direct correlation to the Dynamic Skills Audit and Burning Glass baseline skills as listed in the labor market data. The Burning Glass Dynamic Skills Audit reflected that the top base line skills for this particular course included Communication, writing, organizations, project management, analytical and computer skills.

Table: Standard Reviewed Standards for Course Outcomes

Standard Reviewed	N/A	Satisfactory	Not Satisfactory
A.1 The learning outcomes are clearly stated and mapped to specific objectives and/or assignments.			X
A.2 Prerequisites and/or any required competencies are clearly stated.		X	
A.3 Learning objectives for each course describe outcomes that are measurable.		X	
A.4 Learning objectives are appropriately designed for the level of each of the course.		X	
A.5 Instruction, activities, and assignments in courses are scaffolded from course to course, and throughout the program.		X	

A.1 – ETC225 has very specific learning outcomes that are measurable. However, they are not mapped to specific assignments. The reviewer suggests mapping the outcomes to the direct assessments (4 exams, labs and the one assignment). Direct correlation to the learning outcomes and assessments are encouraged.

A.2 - The course prerequisites are indicated.

A.3 - Course objectives are measurable and well described.

A.4 - Learning objectives are aligned to industry standards.

A.5 – Activities are scaffolded and appear to build on one another.

****Reviewer Note:** While the course outcomes are clearly stated and contain very specific measurable measures, it would also be recommended to include the program mission or goals in the course syllabus for clear assessment measuring. A deeper assessment could possibly be conducted that would match the course learning outcomes to specific program outcomes (or certificate). This would illustrate a direct impact on student learning.

B. Relevancy

Items Reviewed include:

- Dynamic Skills Audit Summary Report (Academic Years 2014-2015)
- Burning Glass Labor Market Data reports (Compilation)
- Advisory Board Minutes

Findings include:

Course competencies are relevant to students, industry, and employers. Strong evidence was found in the Dynamic Skills Audit Summary Report. Direct ties were found through interviews with stakeholders and in Advisory Board minutes.

The table that follows is a clear matrix of how the course outcomes are relevant to students, industry, and employers:

Table: Matrix of evidence-based skills mapped to students, industry, and employers

Standard Reviewed	N/A	Satisfactory	Not Satisfactory
B.1 Course competencies represent industry's expectation of the overarching knowledge, skills, and abilities that 1 st year college students should possess.		X	
B.2 Core course competencies are relevant to industry and employers.		X	
B.3 Instruction, activities, and assignment in individual courses are relevant and engaging to students.		X	

B.1 - Yes. The course competencies represent the industries expectations. As an example, here is a direct job description that has a narrative describing the roles and responsibilities of the candidates. The phrases are highlighted that are a direct match to this course:

B.2 - Yes. Core competencies are relevant to industry and employers and evidence of this was verified using the Burning Glass labor market data relative to STEM occupations (<http://burning-glass.com/research/stem/>) and the Dynamic Skills Audit Summary. This Reviewer took the interview summaries from Advisory Board members, current job openings and descriptions and matched them directly to all ten of the listed course objectives.

B.3 – Yes. Activities and instruction defined in the course outline offer real-world application in design and modeling that are required of any person seeking employment in this field.

C. Resources & Materials

Items Reviewed include:

- Dynamic Skills Audit Summary Report (Academic Years 2014-2015)
- Burning Glass Labor Market Data reports (Compilation)
- Advisory Board Minutes

Findings include:

Instructional materials being delivered achieve stated course objectives and learning outcomes. A formal course review was conducted that address more specifically course content and instructional design processes. However, in this SME report, specific findings in this section relate specifically to the overall instructional materials which contribute to the ten specific course outcomes.

Responsibilities:

- Troubleshoot and repair equipment (either electrical/electronic and programmable or mechanical, hydraulic, and pneumatic)
- Support equipment modifications, redeployments and equipment installations
- Support and work with production departments' and engineering personnel to continually improve facility and equipment maintenance program
- Detect and report improper operation, faulty equipment, defective materials and unsafe & unusual conditions to supervisor with improvement suggestions
- Maintain necessary records
- Adhere to strict safety and cleanliness standards including utilizing provided equipment to minimize risks
- Perform other duties as required or directed

Education

- High School Diploma/GED Required
- Year Technical Degree Preferred

Special knowledge, capabilities, qualifications:

- Minimum of 2 years of maintenance experience with electrical focus
- Ability to read and understand department related drawings and manuals including mechanical drawings, diagrams and blueprints
- Ability to use electrical, electronic and PLC testing and diagnostic equipment (Electrical)
- Knowledge of basic circuit design (Electrical)
- Familiarity with applicable state, local and federal codes
- Capability to troubleshoot and repair both electrical and mechanical equipment preferred
- Working knowledge of lockout-tagout procedures and appropriate OSHA standards
- Ability to anticipate and pro-actively address problems
- Maintain positive attitude
- Ability to work independently, in a team environment and with outside vendors and contractors

Table: Instructional materials and their direct link to course outcomes

Standard Reviewed	N/A	Satisfactory	Not Satisfactory
C.1 The instructional materials contribute to the achievement of the stated course learning		X	
C.2 The purpose of the instructional materials is clearly explained.		X	
C.3 The instructional materials present a variety of perspectives and approaches on		X	
C.4 The instructional materials are appropriately designed for the level of the course.		X	

C.1 - Yes. The course materials contribute to the achievement of the stated learning objectives, although the alignment can and should be strengthened.

C.2 - Yes. The purpose of the instructional materials was clearly explained. Lectures and PowerPoints with demonstrations provided.

C.3 - Yes. A variety of projects were identified. The reviewer recommends small group projects to satisfy particular learning outcomes and encourage collaboration. Collaboration and Communication was a soft skill mentioned on the Burning Glass Data. It is advised and suggested to include more written and oral communication opportunities.

C.4 - Yes.

D. Assessment & Measurement

Items Reviewed include:

- Dynamic Skills Audit Summary Report (Academic Years 2014-2015)
- Burning Glass Labor Market Data reports (Compilation)
- Advisory Board Minutes

Table: Measurement of effective learning

Standard Reviewed	N/A	Satisfactory	Not Satisfactory
D.1 The course evaluation/criteria/course grading policy is stated clearly on each syllabus.		X	
D.2 Course-level assessments (those that can be delivered) measure the stated learning objectives and are consistent with course activities and resources.		X	
D.3 Specific and descriptive criteria are provided for the evaluation of students' work and participation and are tied to the course grading policy.			X
D.4 The assessment instruments (that can be delivered) are sequenced, varied, and appropriate to the content being assessed.		X	

Findings include:

Assessment strategies use established ways to measure effective learning, evaluate student progress by reference to stated learning objectives, and are designed to be integral to the learning process. Reviewer appreciates the lab activities mixed with theory; this is good balance and matches the job descriptions the reviewer found.

D.1 - Yes. Grading is broken into several components and provides opportunity for a variety of course activities, including technical presentations, exams, and assignments. The Reviewer applauds this variety and balance in grading. The chart was a nice visual.

D.2 - Yes. This is somewhat implied. The assessments (exams and exercises) appear to align with stated course-level objectives. This can be strengthened through describing this alignment. Reviewer suggests strengthening the tie between course activities/assessments to specific outcomes.

D.3 - This Reviewer did not find any specific or descriptive criteria that was provided for the evaluation of student work. As mentioned previously, this could be solved with a simple outline listing each assignment, the due date, total points possible, and a grading rubric (or link to). In order to encourage students, especially in this particular field, it would be best practice to list assignments and due dates early so students are prepared for their learning.

D.4 - This Reviewer found sequenced and varied grading strategies, including presentations, assignments, and labs with theory. The Reviewer encourages this variety.