

Long Beach City College

Trades and Industrial Technologies

Electrical Technology

Date: Friday, February 16th, 2018

Time: 12:00pm

Meeting Minutes to discuss the following:

1. Associate Science Degree and Certificate of Achievement – Electrical Technology
2. New Industry Focused Certificates of Achievement – Electrical Technology
3. Math Requirements for Electrical
4. Distance Learning/Hybrid Status for Electrical Code Classes
5. Prerequisite Changes and Lecture/Lab Changes for Courses
6. Inactivation of Courses
7. Non-Credit Courses
8. Non-Credit Certificates
9. New Classes

Member's Present:

Suzanne Englehardt – Content Expert and faculty member

Matt Turlo - Content Expert and faculty member

Scott Fraser – Department Head, Trades and Industrial Technologies

Industry Representatives

James Hotard – Oceaneering International

Nenad Pasic – TDE Inc.

Tony DeMaria – TED Inc.

Deidre Sullivan – Marine Advanced Technical Education Center

David Cooper – TABC

Mike Sickles – City of Long Beach, Traffic Operations

Bob Shepphard – Intellirent

Scott Precop – LBCC Electrical Student

Gene Carbonaro – Dean, CTE

Discussion:

After introductions, Scott Fraser introduced the new curriculum layout. Currently students complete 37.5 units of classes, then choose from any of several electives to round out an additional 7.5 units of classes. As a result, students are not focusing on any single industry sector. It was stated that the Electrical Program has been working with the industry advisory group over the past two years to develop this new sequence of classes with defined industry groups.

The technical program for both the Certificate of Achievement and the Associate Degree are the same classes with the difference for the Associate degree being the addition of General Education classes that follow any one of the college General Education patterns.

The discussion that followed, members agreed that the current method does not result in students sufficiently trained for their areas.

The new reworked proposal was discussed by members and consists of the following

The Certificate Achievement or Degree in Electrical Technology shall consist of the following core classes PLUS completion of one additional industry Certificate of Achievement.

CORE CLASSES:

ELECTRICAL CORE CLASSES

ELECT 253	OSHA Standards for Construction Safety	2		
ELECT 225	Algebra & Trigonometry for Technicians	4		
ELECT 204	First Semester Fundamentals of D.C.	4		
ELECT 240	Introduction to the National Electrical Code	3		
ELECT 209	Second Semester Fundamentals of Motors/Generators	4		
ELECT 435A	Electric Motor Control 1	2		
ELECT 212	Third Semester Fundamentals of AC Electricity	4		
ELECT 214	Fourth Semester AC Principles and Practices	4		
ELECT 242	Electrical Code – Grounding	1.5	28.5	Units

Plus one of the following Industry Certificates of Achievement

Solar Installation and Maintenance

ELECT 246	Electrical code, Solar	1		
ELECT 256	High Voltage Safety Awareness	1		
ELECT 262	Solar 1 – Grid-Tied Solar Photovoltaics	3		
ELECT 263	Solar 2 – Advanced Solar Photovoltaics	3		
ELECT 277	Blueprint Reading for Electricians	3		
ELECT 275	Electrical Pipe Bending	1	12	Certificate
			40.5	Total Units

CISCO Certified Network Installation Associate

CISCO 251	Introduction to Networking	3		
CISCO 252	Routing and Switching Essentials	3		
CISCO 253	Scaling Network	3		
CISCO 254	Connecting Networks	3	12	Certificate
			40.5	Total Units

Traffic Signal Technician

ELECT 280	Traffic Signal Systems 1	3		
ELECT 284	Traffic Signal Controllers & Digital Systems	3		
ELECT 285	<i>Traffic Signal Inspection and Safety</i>	2		
ELECT 275	Electrical Pipe Bending	1		

ELECT 256	High Voltage Safety Awareness	1	10	Certificate
			38.5	Total Units

Automation Technician

ELECT 227	Variable Speed Drive Fundamentals	2		
ELECT 230A	Robotics Technology-Design	2		
ELECT 230B	Robotics Technology-Integration	2		
ELECT 231	Electro-Hydraulics and Pneumatics System	2		
ELECT 256	High Voltage Safety Awareness	1		
ELECT 435B	Introduction to PLC Programming	2	11	Certificate
			39.5	Total Units

General Industrial Electrician

ELECT 245	Electrical Code – Commercial	3		
ELECT 250	Electrical Code – Industrial	3		
ELECT 271	Electrical Cost Estimating	3		
ELECT 275	Electrical Pipe Bending	1		
ELECT 277	Blueprint Reading for Electricians	3	13	Certificate
			41.5	Total Units

NETA High Voltage Test Technician

ELECT 250	Electrical Code – Industrial	3		
ELECT 256	High Voltage Safety Awareness	1		
ELECT 265	Conductors	2		
ELECT 266	Circuit Breakers	2		
ELECT 267	Switch Gear and Switchboards	2		
ELECT 268	Transformers	2	12	Certificate
			40.5	Total Units

Discussion proceeded, major comments included

Tony DeMaria commented that the NETA High Voltage Test Technician classes fills the gap between the existing LBCC curriculum and the InterNational Electrical Testing Association (NETA) requirements. He reminded the panel that LBCC and NETA signed the first ever sanctioning of the LBCC Electrical Program as it will exist in it proposed form. Bob Sheppard affirmed Intellirent's commitment to provide high voltage test equipment free of charge for the high voltage classes. Scott F. reminded the attendees that while the classes will be covering high voltage concepts up to 12,000 volts, that students would never be working with voltages that high. The highest voltage used in the Electrical Program is 240 Volts, three phase. The work with the test equipment is always performed in a de-energized state eliminating the need for the high voltages in class.

James Hotard from Oceaneering International stated that the mix of controls, pneumatics and hydraulics is what they are looking for in ROV technicians and that the Automation Technician area is what they need from our students. David Cooper agreed, but asked about the addition of welding to the certificate. It was mentioned that the welding would add an additional 4-8 units to an already high unit count and that statements in the curriculum guide would be added for additional recommended classes of Weld 50 (Introduction to Welding) and MTFAB 280 (Introduction to Robotic Welding)

Comments around the table were provided affirming the value of the new configuration of courses. Questions were asked regarding the removal of ELECT 202 Electrical Math from the required classes.

Suzanne discussed the current state of ELECT 202 and the poor success rate of this class. It has been as low as 27% when offered online and typically runs around 50%. Students then repeat the class, and many fail again. In surveying the students, there were many reasons found for this low success rate.

1. Lack of discipline in completing homework assignments
2. Interference from work, family and life
3. Not grasping the concepts and getting frustrated

The faculty of the Electrical Program recognizes this problem and have been working with the class, instructors and students over the past six years to try and increase the success rate. There hasn't been any one item that made any substantive change.

In discussion with our industry advisors, other campus faculty members and the electrical program faculty, a radical change was developed that we hope will increase success rate and help students at the same time. The plan is to offer a series of non-credit classes for students to prepare themselves for entry into the Electrical Program. Some of this is similar to what the IBEW electrical union has been doing by requiring completion of college algebra prior to applying for their program. While this step does not go that far, the electrical faculty feels that it is superior in that it gives the students a fighting chance to improve their math skills taking advantage of the non-credit program.

Scott F. then took time to discuss non-credit classes at the college, the advantage to the students, no cost to the students other than time and the repeatability that these classes have. Currently, there are at least a half dozen or so prospective electrical students who fail or drop ELECT 202 for the third time and run into a wall as far as continuing their electrical education. Many members were surprised to hear this, but all agreed that it sounds like a problem in need of a fix.

The entry non-credit program was then provided to the members.

Electrical Program Preparation

ELECT 600	Elect Preparation And Orientation	9	hrs
ELECT 602	Electrical Mathematics (was: ELECT 202)	54	hrs
ELECT 641	Electrical Program Computer Applications (was: ELECT 41)	72	hrs
		135	hrs

This would be a non-credit certificate providing the students an orientation into the Electrical Program where expectations and program safety are covered. The ability to work on their math skills until such point that they have mastered the necessary concepts and finally a course on computer applications where they can learn how to use most of the computer programs used in the Electrical Program to develop and build and industry standard lab report.

Discussion was held, and the unanimous contention was that this sounds like it has the best shot of improving the completion of the Electrical Math and helping students move successfully into the electrical program.

A call for a vote on the above items was mentioned before we got too far into the meeting and forgot what we had discussed.

Nenad Pasic motioned that we accept the proposed changes discussed so far. It was mentioned that we should list all those, so we know what was being vote on.

1. The Certificate Achievement or Degree in Electrical Technology shall consist of the listed core classes PLUS completion of one additional industry Certificate of Achievement.
2. The new industry Certificates of Achievement are
 - a. Solar Installation and Maintenance
 - b. CISCO Certified Network Installation Associate
 - c. Traffic Signal Technician
 - d. Automation Technician
 - e. General Industrial Electrician
 - f. NETA High Voltage Test Technician
3. Non-Credit Certificate
 - a. Electrical Program Preparation

With all the items listed Tony DeMaria seconded the motion. All were in favor.

Suzanne led a discussion for online and hybrid courses and stated that we would like to offer all our National Electrical Code classes in three formats. Face-to-Face only, Hybrid and Online Only. We currently have offered ELECT 240, ELECT 242, ELECT 245 and ELECT 250 as Online and would like to institutionalize this for all our code classes and any future code classes. Questions were asked about student success, discussion was held. Scott F. mentioned that ELECT 242 (1.5 units) was taught as a hybrid class during a winter session. Zero students dropped the class and the class average was approximately 94% with the minimum being 89%.

Scott Precop motioned for all Electrical Code classes being offered as Face-to-Face only, Hybrid and Online Only. Deidre Sullivan seconded the motion. All were in favor.

A discussion was then held about classes, lecture/lab hour ratios and prerequisites. The discussion then was summarized with the following proposed changes.

Prerequisite changes

ELECT 245	ELECT 240 only
ELECT 250	ELECT 240 only
ELECT 242	ELECT 240 only
ELECT 240	ELECT 204
ELECT 227	ELECT 204 or ETEC 40
ELECT 231	ELECT 204 or ETEC 40

Much of this is cleaning up from classes that are being in activated. ELECT 242 is being changed to reflect the past practice of allowing students to enroll via prerequisite challenge after completing ELECT 240. ELECT 240 is one of the more successful classes and the prerequisites need adjusting to reflect current practice.

Once the non-credit courses are approved, the prerequisites for ELECT 204 and ELECT 225 will be changed to ELECT 202 or ELECT 602 to accept successful completion in the non-credit course as a prerequisite.

Hour Changes

From two classes 3 units lecture and 1-unit lab to one class, 4 units lecture/lab same number of total hours for each component. The rationale here is that students who fail one component or the other when offered separately, do not succeed as well when taking a single component in later semesters. By combining the lecture and lab portions into the same course, we look to improve student success. Classes involved are ELECT 204, ELECT 209, ELECT 212 and ELECT 214

Lecture/Lab Ratios. The following classes are currently 2.5 hours lecture and 1.5 hours lab and 3 units. To better reflect current classroom practice they are being changed to 1-hour lecture and 3 hours lab (2 units) to focus on the hands-on skills required in these classes
ELECT 227, ELECT 230A, ELECT 230B, ELECT 231

The following classes are currently 2 hours lecture and 1-hour lab and 1 units. To better reflect current classroom practice they are being changed to 1-hour lecture and 3 hours lab (2 units) to focus on the hands-on skills required in these classes.
ELECT 435A and ELECT 435B

Inactivated Courses.

In response to all the changes proposed in this meeting, the by-product is that a number of classes are no longer needed. The 6.8 to 8-unit 200A, 200B, 200C and 200D classes will no longer be offered. The stand-alone lab classes will no longer be offered. ELECT 230C has only been offered on an infrequent basis in the past and is not needed in the new curriculum. ELECT 261 is also not needed in the new curriculum.

The list of courses to inactivate are:

ELECT 230C	Robotics Technology-Applications	ELECT 210A	Laboratory Practices 1
ELECT 210B	Laboratory Practices 2	ELECT 210C	Laboratory Practices 3
ELECT 210D	Laboratory Practices 4	ELECT 261	Introduction to Renewable Energy
ELECT 200A	First Semester Industrial Electricity	ELECT 200B	Second Semester Industrial Electricity
ELECT 200C	Third Semester Industrial Electricity	ELECT 200D	Fourth Semester Industrial Electricity

Deidre Sullivan motioned to approve these prerequisite changes, lecture/lab hour changes and course inactivation, Scott Precop seconded. All were in favor.

Scott F. lead the next discussion about non-credit courses in underwater robotics and the addition of two new non-credit certificates.

LBCC has provided teacher training classes in underwater robotics and has been successful in training several middle school, high school and community college instructors in the concepts of underwater robotics.

A series of three classes have been offered building teacher skills and the ability to bring these concepts back into the classroom. Teachers taking the classes have requested a formal certificate of completion and this next set of classes and certificate address that request. Teachers can use this completion certificate for continuing education hours and salary increases from their districts.

1. Underwater Robotics Teacher Preparation

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|----|-----------|-----------------------------------|--------|----------------|
| a. | ELECT 610 | Underwater Robotics - PufferFish | 40 hrs | (beginning) |
| b. | ELECT 611 | Underwater Robotics - TriggerFish | 40 hrs | (intermediate) |
| c. | ELECT 612 | Underwater Robotics - Sensors | 40 hrs | (advanced) |

In addition, LBCC students working on underwater robotics projects ask for additional classes to take once they have completed ELECT 230A and 230B (robotics). There are hundreds of student hours going unaccounted as they come back to work on their underwater robotics projects. It is not uncommon for a student to spend an additional two years while at LBCC on the robots after completing ELECT 230A and 230B. By capturing these hours and providing the students with a certificate, it is something that will lead directly to employment in the robotics, automation and underwater robotics industries.

2. Underwater Robotics Skill Building

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|----|-----------|-----------------------------------|--------|
| a. | ELECT 630 | Underwater Robotics - Fabrication | 72 hrs |
| b. | ELECT 631 | Underwater Robotics - Programming | 72 hrs |

Discussion was held about these courses and all agreed that it was a good idea for both teachers and LBCC students. In addition, the comment was made about the teachers developing a pipeline of students into the LBCC Electrical Program.

Deidre Sullivan motioned to these new courses and two new non-credit certificates. James Hotard seconded the motion. All were in favor.

Before adjourning, Scott F. realized that we had not specifically mentioned in the discussion about the new for credit classes developed to fill these certificates. Plus, one additional certificate. He then listed the new classes.

1. ELECT 265 Conductors 2 units
2. ELECT 266 Circuit Breakers 2 units
3. ELECT 267 Switch Gear and Switchboards 2 units
4. ELECT 268 Transformers 2 units
5. ELECT 285 Traffic Signal Inspection and Safety 2 units
6. ELECT 246 Electrical code, Solar 1 unit

Tony DeMaria quickly motioned to accept all these classes, Bob Sheppard seconded, all were in favor.

The final certificate was presented and was described as a stackable certificate. Many students come into the LBCC program and after taking a few classes can pick up an electrical job and might not return for a few years. Others after picking up a similar number of classes can obtain employment in the IBEW Electrical Union. This next Certificate of Achievement provides students with a record of completion of these classes and recognition of a significant milestone.

Electrical Apprenticeship Preparation

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|--------------|--|----------------|
| 1. ELECT 225 | Algebra & Trigonometry for Technicians | 4 units |
| 2. ELECT 253 | OSHA Standards for Construction Safety | 2 units |
| 3. ELECT 204 | First Semester Fundamentals of D.C. | 4 units |
| 4. ELECT 275 | Electrical Pipe Bending | 1 units |
| 5. ELECT 240 | Introduction to the National Electrical Code | 3 units |
| | | 14 total units |

After a short discussion, James Hotard motioned to accept this certificate, Scott Precop seconded. All were in favor.

Meeting was adjourned at 2:45pm