I. **OVERVIEW**

The following information will appear in the 2009 - 2010 catalog

**ELTEC 265 Troubleshooting Techniques**

Fast and efficient troubleshooting methods are presented and practiced. Covers single-solution problems commonly found in industrial equipment and processes, business, medicine, and everyday life. Prepares students to actively troubleshoot problems in personal and professional life. Multiple-solution problem-solving, brainstorming, and "out of the box" thinking methods also presented and practiced. This course is approved by the State of California for the DAS Electricians Training program. Field trips are not required. Course is applicable to the associate degree.

II. **LEARNING CONTEXT**

Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   The content listed below is presented in a fashion that provides the student with a common approach and techniques to reaching root causes of problems. Analytical skills will be developed for single and multi-solution problems. Emphasis will be placed on how the topics relate to common individual and industrial processes. An equal amount of class time is devoted to each topic listed below.

   A. The nature of problems having only one or multiple possible solutions
   B. Establishing troubleshooting lists and procedures for solving problems
   C. Eliminating the maximum number of possible causes in the shortest possible time
   D. Looking beyond the immediate fix for a problem and locate the problem’s root cause
   E. Problem-solving methods to find effective answers to problems with many possible solutions
   F. Evaluation of possible solutions for risk, effectiveness, cost, and additional opportunity
   G. "Brainstorming" techniques to build creative solutions to problems
   H. "Out of the box" thinking techniques for problem solving
   I. Implementing a problem-solving protocol in a business or group environment

B. **HOURS AND UNITS**

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<th>TERM HOURS</th>
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<tr>
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C. **METHODS OF INSTRUCTION (TYPICAL)**

Instructors of the course might conduct the course using the following method:

1. Related material will be presented by means of class lecture, lecture/demonstrations, and student-participation exercises.
2. Professor presents lecture/activity sessions using real-world problems promote familiarity with course topics.
3. Class-wide group discussions that relate to course topic principles are conducted.

4. Professor encourages each student to participate in troubleshooting and problem-solving exercises on an individual level, as well as operate in a group environment to expand and refine personal ideas into the best possible solution for the sample problems offered.

D. **ASSIGNMENTS (TYPICAL)**

1. **EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS**
   
   *Time spent on coursework in addition to hours of instruction (lecture hours)*

   Daily reading assignments from the handouts provided.

   Daily homework problems and troubleshooting research from the handouts.

   Up to two reports on troubleshooting methodology used in a practical problem.

2. **EVIDENCE OF CRITICAL THINKING**
   
   *Assignments require the appropriate level of critical thinking*

   Assignments:

   1. List the troubleshooting steps in "Result-Centered" troubleshooting.

   2. What are 6 potential problem sources and solutions to: "Our sales are down by 10% this month".

   Exam Questions:

   1. List the four main steps in brainstorming.

   2. What is the main theme in "out of the box" thinking?

E. **TEXTS AND OTHER READINGS (TYPICAL)**

1. Other: Class handouts will be provided as appropriate.

III. **DESIRED LEARNING**

A. **COURSE GOAL**
   
   *As a result of satisfactory completion of this course, the student should be prepared to:*

   Effectively solve single and multiple-solution problems encountered in personal and professional life. Students will also be prepared to properly use brainstorming and "out of the box" thinking techniques.

B. **STUDENT LEARNING GOALS**
   
   *Mastery of the following learning goals will enable the student to achieve the overall course goal.*

1. **Required Learning Goals**
   
   *Upon satisfactory completion of this course, the student will be able to:*

   a. Establish troubleshooting lists and procedures for solving problems on business, professional, and personal levels.

   b. Use “brainstorming” techniques to build creative solutions to problems.

   c. Use problem-solving methods to find effective answers to problems with many possible
solutions.

d. Evaluate each possible solution for risk, effectiveness, cost, and additional opportunity.

IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT

1. Individual written exercises and/or problems that demonstrate and reinforce the fundamental principles of each course topic

2. Group oral and written exercises and/or problems that demonstrate and reinforce the fundamental principles of each course topic

B. SUMMATIVE ASSESSMENT

1. Written examinations including problems and class room exercises that require the student to demonstrate mastery of the troubleshooting and problem-solving fundamentals.

2. Up to two written reports based on the troubleshooting methodology presented.