I. INTRODUCTION

A. This course is a Capstone for the electronics program. The student must pass the ISCET Associate Certified Electronics Technician Exam and the ETA Associate Basic Electronics Exam.

B. A Review of electronics concepts and principles in preparation for sitting for a certification examination administered by an outside organization or agency.

C. This course serves as a required or elective course on various degree plans. Curriculum plans for degrees and certificates, are listed in the current Central Texas College Catalog.

D. The delivery method of this course may be traditional lecture/lab, blended lecture/lab, or online.

E. Prerequisites: CETT1441 Solid State Circuits, CETT1449 Digital Systems.

II. LEARNING OUTCOMES

Upon successful completion of this course, Certified Electronics Technician Training, the student will be able to:

Show a proficiency to pass the certification examination which is administered by an outside organization or agency. (C5, C6, C15, C18, C20, F1, F2, F3, F4, F9, F10)

III. INSTRUCTIONAL MATERIALS

A. The instructional materials identified for this course are viewable through www.ctcd.edu/books

B. Lecture Classes also require at least one USB storage device. Online students may use cloud based storage.

C. Students will need an engineering calculator capable of performing logarithmic functions, roots, and powers.
IV. COURSE REQUIREMENTS

A. Attend both lecture and lab or in the case of online delivery, be actively engaged in Blackboard and maintain constant progress.

B. Be prepared to participate in discussion, team projects/assignments and take unannounced assessments relating to the lecture materials.

C. Complete all exams/assessments.

D. Submit all assignments on time.

E. Students must have access to Certification Administrators for ISCET and ETA tests. There is a fee of approximately $70 for each exam.

V. ASSESSMENTS

A. Student content mastery will be evaluated in the following areas:
   • Assignments
   • Mid-term assessment
   • Passing exams from both the International Society of Certified Electronics Technicians (ISCET) Associate and the Electronics Technician Association, ETA Associate.

B. Scheduled and unscheduled assessments will be given at the discretion of the instructor.

C. Exams/assessments may be composed of both subjective and objective questions plus computer output.

D. A student must take all exams/assessments. No make-up exams/assessments will be given. Both online and on campus students who know in advance that they will be absent due to school sponsored trips, military duty or orders, or any other valid reason, must arrange to take an early exam/assessment. Unexpected absences due to illness or other extenuating circumstances will require the student to see the instructor about make-up work in lieu of the missed exam/assessment.

E. Students with unexcused absences will be given a zero for each missed assignment.

F. This is a Capstone course. You must pass both exams (75%) to pass the course.
G. The ISCET exam may be taken 3 times. The ETA exam may be taken twice.

VI. SEMESTER GRADE COMPUTATIONS

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>Points</th>
<th>Points</th>
<th>Grade</th>
<th>Quality Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>200</td>
<td>900-1000</td>
<td>A-Superior</td>
<td>4</td>
</tr>
<tr>
<td>Midterm Assessment</td>
<td>200</td>
<td>800-899</td>
<td>B-Above Average</td>
<td>3</td>
</tr>
<tr>
<td>ISCET Associate Exam</td>
<td>300</td>
<td>700-799</td>
<td>C-Average</td>
<td>2</td>
</tr>
<tr>
<td>ETA Associate Basic Electronics Exam</td>
<td>300</td>
<td>600-699</td>
<td>D – Passing but</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1000</td>
<td>0-599</td>
<td>F-Failure</td>
<td>0</td>
</tr>
</tbody>
</table>

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM THE INSTRUCTOR

A. Course Withdrawal: It is the student’s responsibility to officially withdraw from a course if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The student must sign the withdrawal form.

CTC Form 59 will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is:

- 10-week session Friday of the 8th week
- 8-week session Friday of the 6th week
- 5-week session Friday of the 4th week

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

For non-GoArmyEd active military students, the effective date of withdrawal is the filing date with the Education Center. For all other students, the effective date of withdrawal is the date that the withdrawal application is received by the Central Texas College representative.

Students who used financial aid, military tuition assistance, VA benefits, or other non-personal funds may be required to repay tuition and fees to the funding agency. For specific repayment requirements, contact the Office of Student Financial Aid or Veterans Services Office before withdrawing. Military tuition assistance students should visit their military Education Center or Navy College Office.
A student who officially withdraws will be awarded the grade of “W” provided the student’s attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the College before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued a grade of “F,” “FI,” “FN,” “IP,” or “XN.”

B. Instructor Initiated Withdrawals: Faculty are authorized to withdraw students who are not making satisfactory course progress to include failure to meet College attendance requirements as outlined in the section of the Catalog entitled “Satisfactory Progress Standards.” The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.

Students enrolled in distance learning courses are expected to maintain constant progress throughout the course. Failure to do so may result in the student being administratively withdrawn by the instructor.

Students who have not attended class by the 12th class day of a 16-week course or the 6th class day of an 8-week term may be administratively withdrawn by the instructor with a grade of "W." Students may be administratively withdrawn from any class when their absences reach a total equal to 12.5% of the class hours for the course; and in the opinion of the instructor, the student cannot satisfactorily complete the course. An example: Students attending a 48-hour class during an 8-week period normally meet 180 minutes each session for 16 sessions. Those students accumulating two (2) unexcused absences are subject to Administrative Withdrawal since the total unexcused absences equal 12.5% of class hours for the course. Those students attending a 48 hour class during a 16-week period normally meet 90 minutes each session for 32 sessions. Those students accumulating four (4) unexcused absences are subject to Administrative Withdrawal since the total unexcused absences equals 12.5% of class hours for the course. In a distance learning course the last date of attendance is the last activity by the student in the course.

C. Administrative Withdrawal: A student may be administratively withdrawn by a designated member of the administrative staff of the College when the student has been placed on Academic Suspension or Disciplinary Suspension; the student has an outstanding financial obligation owed to the college; or the student registered for a course without the required prerequisite or departmental permission.

The College is under no obligation to refund tuition and fees, or other costs associated with an administrative or instructor initiated withdrawal.

D. Incomplete Grade: The College catalog states, “An incomplete grade may be given in those cases where the student has completed the majority of the
coursework but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course...” Prior approval from the instructor is required before the grade of “IP” for Incomplete is recorded.

E. **Cell Phones and Pagers:** Students will silence cell phones and mobile devices while in the classroom or lab.

F. **Americans with Disabilities Act (ADA):** Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Review the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

G. **Instructor Discretion:** The instructor reserves the right of final decision in course requirements and may make changes to the course outline and/or assignments as needed.

H. **Civility:** Individuals are expected to be aware of what a constructive educational experience is and be respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

I. **Degree Progression:** Students who receive a grade of “D” are advised not to enroll in the next course for which this course was a prerequisite.

J. **Failing Grade:** The grade of “F” or “FN” will be given for academic failure, non-attendance or scholastic dishonesty.

K. **Scholastic Honesty:** All students are expected to maintain the highest standards of scholastic honesty in the preparation of all course work and during examinations. The college policy on scholastic honesty, including definitions on plagiarism, collusion, and cheating can be found at the following URL: [http://online.ctcd.edu/plagiarism.cfm](http://online.ctcd.edu/plagiarism.cfm)
VIII. COURSE OUTLINE

A. Lesson One: What You Should Know About the CET Tests

1. Lesson Objectives: Upon successful completion of this Lesson, the student will be able to:
   - Review costs, rules, and procedures for taking the CET tests from ISCET and ETA.

2. Learning Activities:
   a. Classroom lecture/discussion (F5, F6)
   b. Reading assignments: As assigned (C5, C6)

3. Unit Outline: Follows the series of Lesson Objectives.

B. Lesson Two: Basic Math, DC, and AC Circuits

1. Lesson Objectives: Upon successful completion of this Lesson, the student will be able to:
   a. Review linear, bilateral, and two-terminal circuit elements
   b. Explain nonlinear two-terminal components
   c. Relate impedance matching
   d. Apply arithmetic operations to binary numbers

2. Learning Activities:
   a. Classroom lecture/discussion (F3, F5, F6)
   b. Reading assignments: As assigned (C5, C6, F1, F2)
   c. Answer problems as assigned (C15, C18, F1, F2, F3, F4, F9)
   d. Practice quizzes (F1, F2, F3, F9, F10)

3. Unit Outline: Follows the series of Lesson Objectives.

C. Lesson Three: Three-terminal and Four-terminal Components and Basic Circuits

1. Lesson Objectives: Upon successful completion of this Lesson, the student will be able to review and explain:
   a. Basic electric circuits
   b. Three-terminal amplifying components.
   c. Noise in amplifiers
   d. Distortion in amplifiers
   e. Special ratings in amplifiers
   f. Thyristor characteristics and applications
2. **Learning Activities:**
   a. Read Chapters assigned (F3, F5, F6)
   b. Answer problems as assigned (C15, C18, F1, F2, F3, F4, F9)
   c. Practice quizzes (F1, F2, F3, F9, F10)

3. **Unit Outline:** Follows the series of Lesson Objectives.

D. **Lesson Four:** Analog Circuits

1. **Lesson Objectives:** Upon successful completion of this Lesson, the student will be able to review and explain:
   a. Amplifiers
   b. Integrated circuit (IC) operational amplifiers (op amps)
   c. Basic op amps
   d. Op amp circuits
   e. Timers
   f. The phase-locked loop (PLL)
   g. Power supplies
   h. Oscillators
   i. Protection circuits

2. **Learning Activities:**
   a. Read Chapter assigned (F3, F5, F6)
   b. Answer problems as assigned. (C15, C18, F1, F2, F3, F4, F9)
   c. Practice quizzes (F1, F2, F3, F9, F10)

3. **Unit Outline:** Follows the series of Lesson Objectives.

E. **Lesson Five:** Digital

1. **Lesson Objectives:** Upon successful completion of this Lesson the student will be able to review and explain:
   a. Numbers and counting systems
   b. Boolean algebra
   c. Symbols and other identifications of gates
   d. Important rules for overbars
   e. DeMorgan’s theorems
   g. Use of three-state devices
   h. Flip-flops
   i. Memories and microprocessors
   j. Characteristics of TTL, CMOS, and ECL logic circuitry

2. **Learning Activities:**
a. Read Assigned Chapters (F3, F5, F6)
b. Answer problems as assigned (C15, C18, F1, F2, F3, F4, F9)
c. Practice quizzes (F1, F2, F3, F9, F10)

3. **Unit Outline**: Follows the series of Lesson Objectives.

**F. Lesson Six: Test Equipment and Troubleshooting**

1. **Lesson Objectives**: Upon successful completion of this Lesson the student will be able to review and explain:
   a. Meter movements
   b. Process for setting up an oscilloscope
   c. Evaluating parameters measurement result for accuracy
   d. Testing amplifiers and using meters and oscilloscopes to troubleshoot them.

2. **Learning Activities**:
   a. Read Chapter as Assigned (F3, F5, F6)
   b. Answer problems as assigned (C15, C18, F1, F2, F3, F4, F9)
   c. Practice quizzes (F1, F2, F3, F9, F10)

3. **Unit Outline**: Follows the series of Lesson Objectives.

**G. Lesson Seven: Practice for Taking CET Tests**

1. **Lesson Objectives**: Upon successful completion of this Lesson, the student will be able to review:
   a. The art of test taking

2. **Learning Activities**:
   a. Read Chapter Assigned Chapter (F3, F5, F6)
   b. Take practice test (F9, F12)
   c. Complete practice exams (C15, C18, F4, F8, F9, F11)

3. **Unit Outline**: Follows the series of Lesson Objectives.