CENTRAL TEXAS COLLEGE
INDUSTRIAL TECHNOLOGY DEPARTMENT
SYLLABUS FOR ABDR 2437
STRUCTURAL ANALYSIS AND DAMAGE REPAIR V

Semester Hours Credit: 4
Contact Hours: 144

INSTRUCTOR: ____________
OFFICE HOURS: __________

I  INTRODUCTION

A. Advanced development of the operation of equipment and the procedures involved in the repairs of body structures. Special emphasis on conducting a thorough damage analysis as well as demonstrating, proper pulling and anchoring techniques.

B. This course is a practical application of skills learned in all Structural Damage Analysis and Repair Classes and will provide real-time repair experience.

C. Structural Damage and Analysis V (ABDR 2437) is a required course for the completion of a Two Year Associate of Applied Science Degree in Auto Collision Repair or a Level I or Level II Certificate of Completion in the Auto Collision Repair Technician Program.

D. This course is occupationally related and serves as a preparation for a career in the Auto Collision Repair Field.

E. Prerequisites: This course has a prerequisite of ABDR 1419, 1441, 1442, 1471, 1472, and 2435 or the consent of the Department Chair.

F. Alpha Numeric Coding used throughout this module book denotes integration of SCANS Occupational Competencies (C1, Etc) and Foundational Skills (F1, Etc).

II  LEARNING OUTCOMES

Upon successful completion of this course, Structural Analysis and Damage Repair V, the student will:

A. Be able to describe the basic types of body/frame construction, their major differences, and their correlating structures. (C15)

B. Describe the basic categories of frame damage. (C15)

C. Select the proper equipment to analyze the nature and extent of frame damage. (C18, 19)

January 10, 2007
D. Correctly perform structural repairs. (C18, 19) (F9)

E. Correct localized and multiple damage through the use of properly designed pulling and anchoring techniques. (C19, 19)

F. Identify and describe the safe and proper set-up and operation of hydraulic body jacking equipment. (C15)

G. Describe the transmission and effects of collision forces on both conventional and unibody construction vehicles. (C15)

H. Describe the dedicated fixture measuring system and its basic operation. (C15)

I. Describe the basic design and operation of the Multi-pull Anchoring System/Machines used in industry. (C15)

J. Describe the safety precautions to be taken in the use of body/frame alignment equipment. (F9)

K. Practice shop safety. Properly use and maintain tools and equipment. (F9) (C20)

### III INSTRUCTIONAL MATERIALS

A. Text:

The instructional materials identified for this course are viewable through [www.ctcd.edu/books](http://www.ctcd.edu/books)

B. Supplemental Reading: As assigned by the instructor.


C. References: As selected by the instructor.

D. Audio Visual Aids: See resource list at end of this module book.

1. “Introduction to Unibody Repair”, Vital Systems Inc. (Video)
2. “Unibody: Damage Analysis”, Vital Systems Inc. (Video)
5. “UMS Training Video”, Chief Automotive Systems (Video)
6. “The Universal Bench”, Vocational Media Associates (Video)
7. “Frame-Unibody Straightening”, Delmar Publishers (Video)
8. “Unibody: Damage Correction”, Vital Systems Inc. (Video)
9. “EZ Liner Training”, Chief Automotive Systems (Video)
10. “Toyota Repair”, Chief Automotive Systems (Video)
11. “Oldsmobile Side Hit Repair”, Chief Automotive Systems (Video)
12. “Replacing Structural Parts, Corrosion Protection”, Delmar Publishers (Video)
13. “Sectioning Front Rails”, (Video)
14. “Sectioning A-Pillars” (Video)
15. “Sectioning B-Pillars” (Video)
16. “Sectioning Rocker Panels”, (Video)

E. Other instruction materials as selected by the instructor.

IV COURSE REQUIREMENTS

A. Your first responsibility is scholarship. The grade you receive will be the result of your efforts both in the classroom and in the laboratory.

B. This course is designed to require a steady, continuous effort from the student. Class participation, initiative, attendance and work efforts will be considered in grade computation.

C. Reading and study assignments will be made by the instructor. Reading of all study assignments is required, as well as specific tasks outlined by the instructor or listed on handouts, or laboratory activity sheets. Specific reading assignments will be assigned by the instructor. Students are required to complete these assignments by the time specified by the instructor. Quizzes may be given on any or all reading assignments.

D. The study of a subject is not limited to the classroom, laboratory, or limits of the syllabus. Each student should seek out and study all available material available on the subject being taught. This might include use of the Internet or the library. In general, two hours of study outside the regular class period is recommended for each hour of classroom work.

E. Students are required to attend class and laboratory sessions regularly. Those who fail to do so may be dropped from the course with a grade of “FN”.

F. Students are required to be present for all examinations. See paragraph V (Examinations) for additional information.

G. Laboratory learning activities (lab tasks) will be completed on an individual basis except when limited by tools and/or materials. Learning activities will be subjectively graded by the instructor. Students assigned to a group must be present at all times when the project is being worked on. Students who are not present while a learning activity is in progress may be given a “0” for that
activity. Students are required to complete all laboratory assignments by the time specified by the instructor.

V EXAMINATIONS

A. There will be a minimum of three major examinations:

1. Three Week Exam
2. Mid Term Exam
3. Final Exam (this is a comprehensive exam)
4. Additional examinations may be given if the instructor determines it is necessary for proper evaluation of the students in the class.

B. Students must be present for all examinations. Make up examinations will not be given. Students who know they will be absent on the day of an examination must make arrangements with the instructor prior to the absence. Students who are absent on the day of the examination due to illness or other extenuating circumstances must present to the instructor an acceptable reason for the absence on the day following the absence.

C. Students without an excused absence will be given a zero for that examination.

D. Students must take the final examination to receive a grade for the course.

VI SEMESTER GRADE COMPUTATIONS

A. Written examinations will count 45% of the student’s overall final grade.

B. Practical, hands-on lab work will count 45% of the student’s overall final grade.

C. Incentive points will count 10% of the student’s overall final grade. Incentive points are earned by doing additional work, written assignments, class participation, demonstrated initiative and positive attitude. Points will be deducted for each unexcused absence, each written assignment not turned in, each tardiness and each failure to secure tools and clean work areas.

D. Grade Computations (Example)

1. Written Exams (45%) (maximum 100 points)
   1st Exam 90
   2nd Exam 90
   3rd Exam +90
   270 divided by 3 = 90 average
2. Lab score (45%) (maximum 100 points)
   Lab score = 80
   45% of 80 = 36 points for lab score

3. Incentive Score (10%) (Maximum 100 points)
   Incentive score = 82
   10% of 82 = 8.2 points for Incentive Score

4. Final Overall Grade Computation
   Written Exam 40.5 Points
   Lab Score 36.0 Points
   Incentive Score 8.2 Points
   84.7 Total Points = a letter grade of “B”

E. Points/Score Equivalents:

<table>
<thead>
<tr>
<th>POINTS</th>
<th>GRADE</th>
<th>POINTS PER SEMESTER HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>80-89</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>70-79</td>
<td>C</td>
<td>2</td>
</tr>
<tr>
<td>60-69</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>0-59</td>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>WITHDRAWAL</td>
<td>W</td>
<td>0</td>
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<tr>
<td>INCOMPLETE</td>
<td>I</td>
<td>0</td>
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</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 withdrawal form must be signed by the student.

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 semester. 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 sued for session of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.
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 the student a grade of “F” or “FN” for nonattendance.

B. Administrative Withdrawal: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on CTC Form 59 for submission to the registrar.

C. Incomplete Grade: The College catalog states, “An incomplete grade (“IP”) may be given in those cases where the student has completed the majority of the course work 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. A student who merely fails to show for the final examination will receive a zero for the final and an “F” for the course.

D. Cellular Phones and Beepers: Cellular phones and beepers will be turned off while the student is in the classroom or laboratory.

E. American’s 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. Explore the website at 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.

F. Instructor Discretion: The instructor reserves the right of final decision in course requirements.

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

H. Absence from the class may be unavoidable in some situations. These include illness, military/civilian job requirements, or a death in the immediate family. Documentation is required in the case of excused absences for job requirement’s, excuses will be on company letterhead stationary signed by the immediate supervisor stating the reason for the absence for civilian jobs. Excuses for military personnel must be signed by the 1st Sergeant or the Company
Commander. In cases of illness, one day absences may be excused on a statement from the individual stating the reason. For more than one day of illness, the individual must have a statement from the doctor treating the illness. If instructor notes or handouts are given to you, you must study them, exams may be taken from these notes also.
A. **Lesson One:** Structural Analysis and Damage Repair

1. **Learning Outcomes:** Upon successful completion of this lesson, the student will:

   a. Be able to describe the basic types of body/frame construction, their major differences, and their correlations structures. (C15)
   b. Describe the basic categories of frame damage. (C15)
   c. Select the proper equipment to analyze the nature and extent of frame damage. (C19, 19)
   d. Correctly perform body/frame repairs through the use of proper analysis, selection of tools, and sequencing. (C18, 19) (F9)
   e. Correct localized multiple damage through proper holding, anchoring, blocking, and application of force (C18, 19)
   f. Identify and describe the safe and proper set-up and operation of hydraulic power jacking equipment (C15)
   g. Describe the transmission and effects of collision energy forces on both conventions and unibody construction vehicles. (C15)
   h. Describe the dedicated fixture measuring and its basic operation.
   i. Describe the basic design and operation of the multi-pull anchoring systems/machines used in industry. (C15)
   j. Describe the safety precautions to be taken during the use of body alignment equipment (F9)
   k. Practice shop safety. Proper use and maintain tools and equipment. (F9) (C20)

2. **Learning Activities:**

   a. The student will complete reading assignments as assigned. (F1, F11, C5, C6)
   b. The student will study the words/terms and complete written assignments specified by the instructor. (F1, F11, C5, C5, C6)
   c. The student will attend classroom lectures and participate in classroom discussion. (F5 thru 7, F9, F10, C1, C5 thru 7)
   d. The student will observe demonstrations performed by the instructor. (F5, F10, C5, C6, C14)
   e. The student will complete laboratory learning activities assigned by the instructor. See the laboratory learning activity list attached. (F1 thru F17, C1, C3, C5 thru 9, C14 thru 16, C18 thru 20)

3. **Equipment and Materials:**

   a. Vehicle as required
   b. Service publications
   c. TV/VCR (as required)
e. Auto collision Repair Tools and Equipment
f. Other materials and equipment as required by the instructor.

4. Audio Visual Aids: (Recommended)
   a. To be selected by the instructor from those listed in Section III D above.
   b. Others as selected by the instructor.

5. Lesson Outline:
   a. Introduction
   b. Safety
   c. Auto construction
   d. Unibody Damage Analysis.
INSTRUCTIONS FOR ALL STUDENTS: Student texts, notes, and service manuals may be used in performance of the tasks. The instructor must verify satisfactory completion of each task by entering the date and his initials in the date column for each task. The instructor will not verify satisfactory completion of the task until all standards have been met. The grade earned will be entered in the task# column. To meet minimum requirements, the student must correctly complete each task listed below one time. Each performance exam will count 33.3 points. A maximum of 100 points will be awarded. NOTE: Failure to follow instructions, record required data, use correct tools in correct manner, clean work area, secure tools, absence, or unsafe act will result in a deduction of points from your total lab score.

NOTE: See your instructor and ask him to assign you a vehicle(s) on which to complete your performance exam. The vehicle and damage to repair will be subject to vehicles available at the time you start your performance exam.

<table>
<thead>
<tr>
<th>TASK #</th>
<th>LEARNING ACTIVITY DESCRIPTION</th>
<th>DATE</th>
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<tbody>
<tr>
<td>1.</td>
<td>Write an electronic estimate for the vehicle(s) assigned.</td>
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<td>2.</td>
<td>Perform repairs to the assigned vehicle(s) based on estimated repair times and class length. The instructor will determine the extent to which repairs must be completed.</td>
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<td>3.</td>
<td>Properly and safely use and maintain tools and equipment and practice shop safety. Graded throughout the course.</td>
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<td>Total points/grade awarded (possible 100 points)</td>
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# CENTRAL TEXAS COLLEGE
## COMPETENCY PROFILE

<table>
<thead>
<tr>
<th>Program:</th>
<th>Auto Collision Repair Technician</th>
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<tbody>
<tr>
<td>Course:</td>
<td>ABDR 2437 Structural Analysis and Damage Repair V (144 clock hours) (4 Credits)</td>
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<tr>
<td>Entry Occupation:</td>
<td>Auto Body Repair Helper/Apprentice</td>
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<tr>
<td>Instructor:</td>
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<table>
<thead>
<tr>
<th>Student Name:</th>
<th>SSAN:</th>
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<tbody>
<tr>
<td>Date Enrolled:</td>
<td>Date Completed/Withdrew:</td>
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<tr>
<td>Total Hours Absent:</td>
<td>Final Grade</td>
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### RATING SYSTEM

The instructor will evaluate the student by placing a check mark in the appropriate number block to indicate the student’s degree of competency. (Enter N/A if the item is not applicable or not observed.) The rating for each task reflects the instructor’s evaluation of employability readiness rather than the grade given in the class. The final grade is not an average of ratings. The rating scale listed below will be used to rate the student.

### RATING SCALE

1 = 95 (A) = Mastered competency: Highly proficient. Can perform task without supervision. Can teach others. Meets or exceeds SCANS requirements.

2 = 85 (B) = Mastered Competency: Proficient. Can perform task with limited supervision. Meets most SCANS requirements.

3 = 75 (C) = Mastered Competency: Can perform task but requires close supervision. Meets minimum SCANS requirements.

4 = 0 (F) = Did NOT master competency: Unable to or did not attempt to perform task. Does not meet SCANS requirements.
<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>1</th>
<th>2</th>
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<th>4</th>
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<tr>
<td>A. Be able to describe the basic types of body/frame construction, their major differences, and their correlating structures. (C15)</td>
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<td>B. Describe the basic categories of frame damage. (C15)</td>
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<td>C. Select the proper equipment to analyze the nature and extent of frame damage. (C18, 19)</td>
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<td>D. Correctly perform body/frame repairs through the use of proper analyzing, selection of tools, and sequence. (C18, 19) (F9)</td>
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<td>E. Correct localized and multiple damage through the use of properly designed holding blocking, anchoring, and application of force. (C19, 19)</td>
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<td>F. Identify and describe the safe and proper set-up and operation of hydraulic body jacking equipment. (C15)</td>
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<td>G. Describe the transmission and effects of collision forces on both conventional and unibody construction vehicles. (C15)</td>
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<td>J. Describe the safety precautions to be taken in the use of body/frame alignment equipment. (F9)</td>
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<td>K. Practice shop safety. Properly use and maintain tools and equipment. (F9) (C20)</td>
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Workplace Know-How and Personal Characteristics

The rating system listed below will be used by the Worksite Supervisor to evaluate the student’s workplace know-how and personal characteristics. The Worksite Supervisor will evaluate the student on the following competency (task) listed by circling the appropriate rating from the rating scale below that best describes his/her observation of the student during the entire length of this course for the rated area (task). Enter the date the task was completed in the date column.

**Rating Scale**

1  =  Above Average  
2  =  Average  
3  =  Below Average  
N/A  =  Not Observed

<table>
<thead>
<tr>
<th>Work Place Know-How and Personal Characteristics</th>
<th>Rating</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMPETENCIES:</strong> Effective workers can productively use:</td>
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</tr>
<tr>
<td><strong>Resources:</strong> allocating time, money, materials, space, staff</td>
<td>1 2 3 N/A</td>
<td></td>
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<tr>
<td><strong>Interpersonal Skills:</strong> working on teams teaching others, serving customers, leading, negotiating, and working well with people from culturally diverse backgrounds.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Information:</strong> acquiring and evaluating data, organizing and maintaining files, interpreting and communicating, and using computers to process information.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Systems:</strong> understanding social, organizational, and technological systems, monitoring and correcting performance, and designing or improving systems.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Technology:</strong> selecting equipment and tools, applying technology to specific tasks, and maintaining and troubleshooting technologies.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>THE FOUNDATION:</strong> Competence requires:</td>
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<tr>
<td><strong>Basic Skills:</strong> reading, writing, arithmetic and mathematics, speaking and listening.</td>
<td>1 2 3 N/A</td>
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</tr>
<tr>
<td><strong>Thinking Skills:</strong> thinking creatively, making decisions, solving problems, seeing things in the mind’s eye, knowing how to learn, and reasoning.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Personal Qualities:</strong> individual responsibility, self-esteem, sociability, self-management and integrity.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>PERSONAL CHARACTERISTICS</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Relations with others:</strong> effectiveness in working with students, instructors, and others; cooperation; shows respect.</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Dependability:</strong> attendance; loyalty; punctuality; adherence to schedules and deadlines; consistency and results; perseverance</td>
<td>1 2 3 N/A</td>
<td></td>
</tr>
</tbody>
</table>
**Work Attitudes:** willingness to learn; willingness to accept and profit from evaluation; enthusiasm; initiative; commitment; pride in work  

| 1 | 2 | 3 | N/A |

**Communication:** listening; speaking; and nonverbal skills; effectiveness in communicating with staff and other workers.  

| 1 | 2 | 3 | N/A |

**Personal Hygiene-Grooming:** personal health care and cleanliness; dresses and maintains self appropriately for a business environment.  

| 1 | 2 | 3 | N/A |

Based on my observation/evaluation of the student he/she has: (place a “√” in the appropriate block).

<table>
<thead>
<tr>
<th>Entry level skills now.</th>
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</thead>
<tbody>
<tr>
<td>Entry level skills but requires completing additional external learning experience.</td>
</tr>
<tr>
<td>Entry level skills but requires completing additional course work.</td>
</tr>
<tr>
<td>Entry level skills but requires completing additional course work and additional external learning experience.</td>
</tr>
</tbody>
</table>

**Instructor Comments:** (Please provide additional information regarding your evaluation of the student’s performance.)

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

**INSTRUCTOR CERTIFICATION**

I certify this competency profile to be true and accurate to the best of my knowledge.

Signature _________________________________ Date ______________________

I have seen this evaluation and discussed it with my Instructor.

Student Signature ____________________________ Date ______________________