

COURSE OUTLINE

Structural Analysis and Damage Repair I

Course Description:

AB124. Structural Analysis and Damage Repair I – Frames. 3hours credit.
Prerequisites: AB 101 and AB 103 with a C or better. This course will enable the student to apply practical applications in frame inspection, measurement and repair. Welding applications will be used as needed. The emphasis in this course is on straightening and aligning frames to manufacturer's specifications.

Course Relevance:

The principles learned in this course will allow the student to perform the essential tasks of analyzing, preparing, and then performing damage repair and adjustments. These tasks are essential to those aspiring to work in the auto body repair profession.

Required Materials:

Duffey, J., (2001). *I-CAR, Professional Automotive Collision Repair (2nd ed)*. Albany, NY: Delmar Publishing

Learning Outcomes:

The intention is for the student to be able to:

1. Explain how impact forces are transmitted through both frames and unibody construction vehicles
2. Analyze damage using electric and manual measuring systems
3. Diagnose various types of body damages including twist, mashed, sag and side sway

Learning PACT

Through the student involvement in this course, the student will develop and document his/her achievement of the following PACT skills:

Primary skills (developed and documented):

1. Critical Thinking
 - Through exercises that demonstrate the Laser Measuring System, the student will be able to measure damaged vehicle body
2. Problem Solving
 - Through exercises that demonstrate the understanding of steps using the Laser Measuring System, the student will be able to develop problem solving skills that will allow them to determine the amount of damage and cost associated with damage
3. Field-Related Training

- Through “In lab” exercises, the student will be able to demonstrate their understanding of proper use of Laser Measuring System equipment.

Secondary skills (developed but not documented):

Math
Reading

Assessment Tasks:

These learning outcomes and primary Learning PACT skills will be demonstrated by:

1. “Hands on” projects, performing auto collision repair
2. Projects that demonstrate the ability to recognize and utilize the correct techniques and equipment to perform collision repair
3. Projects that demonstrate the ability to identify problems and correct them using accepted collision repair principles

Course Content:

- I. Themes - Key recurring concepts that run throughout this course:
Safety, quality.
- II. Issues - Key issues that will be addressed in this course: areas of conflict that must be understood in order to achieve the intended outcome:
 - A. Planning an auto repair
 - B. Preparing surface for welding and/or repair
 - C. Straightening material
- III. Concepts – Key concepts that must be understood to address the issues:
 - A. Proper planning techniques of repair
 - B. Proper preparation of material and equipment
 - C. Proper performance of repair functions
- IV. Skills / Competencies - Actions that are essential to achieve the course outcomes:
 - A. Identify safe use and maintenance of general mechanical tools
 - B. Demonstrate safe use and maintenance of auto body mechanical tools
 - C. Identify the proper use of fire protection equipment

Learning Units:

- I. Body/paint shop work and safety procedures
- II. Understanding automotive construction
- III. Body shop hand tools
- IV. Body Shop power tools
- VI. Welding equipment and its use
- VII. Basic auto sheet metal work
- VIII. Frame and unibody repairs

Learning Activities:

Learning activities will be geared towards lecture, demonstration, and performance. Classroom lecture is designed to enable the students to understand the key principles in auto body repair.

Grade Determination:

The student will be graded on satisfactory completion of assessment tasks (learning activities), attendance, and written examination.