Butler Community College
Business Technology and Workforce
Development Division

Frank Robinson
Revised Spring 2006
Implemented Fall 2006

COURSE OUTLINE
Non-Structural Analysis and Damage Repair II

Course Description
AB 122. Non-Structural Analysis and Damage Repair II. 2 hours credit. Prerequisites: AB 112 with a C or better. This course will enable the student to apply conventional techniques for unitized body construction. The student will repair auto panels to the manufacturer's specifications while using safety practices.

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. This course and subsequent courses will be taught according to NATEF (National Automotive Technicians Education Foundation)/ASE (Automotive Service Excellence) standards.

Required Materials
Duffey, J., (2004). *Auto body repair technology* (4th ed.). Albany, NY: Delmar Publishing

Learning Outcomes
The intention is for the student to be able to:
1. Apply personal and environmental safety practices
2. Repair and/or replace body panels and then perform adjustments as required

Primary Learning PACT Skills that will be DEVELOPED and/or documented in this course
Through the student's involvement in this course, he/she will develop his/her ability in the following primary PACT skill areas:
1. Field- Related Technology
   - Through lecture/lab exercises, the student will be able to analyze damage and repair and adjust outer body panels.

Secondary skills (developed but not documented):
Math
Reading

Major Summative Assessment Task(s)
These learning outcomes and the primary Learning PACT skills will be demonstrated by
1. Analyzing damage and repairing and adjusting a non-structural panel

Course Content
I. Themes – Key recurring concepts that run throughout this course:

A. Safety
B. Quality

II. Issues- Key areas of conflict that must be understood in order to achieve the intended outcomes:
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. Determine the extent of direct and indirect damage and direction of impact: develop a document of repair plan. High Priority-One (HP-1)
B. Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies (HP-1)
C. Inspect, remove, replace and align hood, hood hinges, and hood latch (HP-1)
D. Inspect, remove, replace and align deck lid, lid hinges, and lid latch (HP-1)
E. Inspect, remove, replace and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware (HP-1)
F. Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware (HP-1)
G. Inspect, remove, replace and align front fenders, headers, and other panels (HP-1)
H. Straighten and rough-out contours of damage panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments (HP-1)
I. Weld damaged or torn steel body panels: repair broken welds (HP-!)
J. Weld and cut high-strength steel and other steels using manufacturer's specifications/procedures (HP-1)
K. Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations (HP-1)
L. Protect computer and other electronic control modules during welding procedures according to manufacturer's specifications (HP-1)
M. Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required (HP-1)
N. Determine the joint type (butt weld with backing, lap, etc.) for weld being made according manufactures/industry specifications (HP-1)

Learning Units

I. Introduction to basic sheet metal repair, and use of safety practices
A. Demonstrate metal straightening techniques
B. Understanding direct and indirect damage
C. Understand sheet metal "workhardening"
D. Hammering and dollying techniques
E. Demonstrating proper sheet metal pulling techniques

II. Understanding metal shrinking systems
    A. Demonstrate with gas torch
    B. Demonstrate with electronic equipment

III. Introduction to different body fillers and glazes
    A. Choose the correct type of body filler for particular repair
    B. Identify correct way to mix filler and hardener
    C. Demonstrate recommended method of shaping body filler

Learning Activities
Learning activities will include lectures, demonstration, and performance. Classroom lecture is designed to enable the student to understand the key principles in auto body repair.

Grade Determination
The student will be graded on completion of assessment tasks (learning activities), and written assignment and examinations.