

Implementation date
Fall 2010

PROGRAM CONCENTRATION: Architecture, Construction,
Communications & Transportation
CAREER PATHWAY: Collision Repair
COURSE TITLE: Non Structural Damage and Body Repair II
PREREQUISITE: Non Structural Damage and Body Repair I

Course Description: Non Structural Damage and Body Repair II is the second course in the non structural strand of the collision repair career pathway that will teach the student skills and knowledge that will help them obtain a career in the automotive body repair industry. The student will learn theory as well as hands on application in a project based setting. This training will give successful completers basic skills and knowledge to obtain an entry level job in the field of non structural damage repair.

ACCT-NSII-1. Moveable Glass and Hardware --- Students will be able to remove and replace vehicle glass according to manufacturer's instructions.

- a. Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.
- b. Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair, and replace weather stripping.
- c. Inspect, repair or replace, and adjust removable, manually or power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.
- d. Inspect, remove, reinstall, and align convertible top and related mechanisms.

Academic Standard(s)

SCSH2- Students will use standard safety practices for all classroom, laboratory and field investigations.

- c. Follow correct protocol for identifying and reporting safety problems and violations.

SCSH3- Students will identify and investigate problems scientifically.

- a. Suggest reasonable hypotheses for identified problems.
- b. Develop procedures for solving scientific problems.
- c. Collect organize and record appropriate data.
- e. Develop reasonable conclusions based on data collected.

Implementation date

Fall 2010

- f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

SPS8- Students will determine relationships among force, mass, and motion.

- e. Calculate amounts of work and mechanical advantage using simple machines.

MM3P1- Students will solve problems (using appropriate technology)

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.

MM3P3- Students will communicate mathematically.

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers and others.

MM3P4- Students will make connections among mathematical ideas and to other disciplines.

- d. Recognize and apply mathematics in contexts outside of mathematics.

National Academic Standards (NATEF)

SC041- Applies and uses laboratory safety techniques.

SC042- Applies and uses tables and graphs.

SC044- Applies and uses scientific method.

SC499- Uses computers for information gathering and estimating.

MA229- Solves problems. Generates conclusions. Demonstrates deductive reasoning.

MA271- Determines proper operation.

MA273- Computes tolerances/ranges mentally.

MA274- Computes proper operations mentally.

ACCT-NSII-2. Metal Welding and Cutting --- Students will be proficient at welding 18 gauge mild steel using the (GMAW) mig welder. The welds learned will be a lap butt and T joints in the overhead, vertical, and flat positions. Also students will learn plug welds in all positions.

- a. Identify weldable and non weldable materials used in collision repair.
- b. Weld and cut high strength steel and other steels.

Implementation date

Fall 2010

- c. Weld and cut aluminum
- d. Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.
- e. Set up and adjust the MIG welder to “tune” for proper electrode stickout, voltage, polarity, flow rate, and wire speed required for the material being welded.
- f. Store, handle, move, and install high pressure gas cylinders.
- g. Determine the ground clamp location and attach.
- h. Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.
- i. Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.
- j. Protect computers and other electronic control modules during welding procedures.
- k. Clean and prepare the metal to be welded, assure good metal fit-up, apply weld through primer if necessary, and clamp is required.
- l. Determine the joint type (butt weld with backing, lap, etc.) for weld being made.
- m. Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation.
- n. Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet.
- o. Perform visual and destructive tests on each weld type.
- p. Identify the causes of various welding defects; make necessary adjustments.
- q. Identify cutting process for different materials and locations; perform cutting operation.
- r. Identify different methods of attaching non-structural components (squeeze type resistant spot welds, riveting, non-structural adhesive, silicon bronze, etc.).

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Implementation date

Fall 2010

- f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

SPS5- Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.

- a. Compare and contrast the atomic/molecular motion of solids, liquids, gasses and plasmas.
- b. Relate temperature, pressure, and volume of gasses to the behavior of gasses.

MM3P1- Students will solve problems (using appropriate technology)

- e. Build new mathematical knowledge through problem solving.
- f. Solve problems that arise in mathematics and in other contexts.
- g. Apply and adapt a variety of appropriate strategies to solve problems.

MM3P3- Students will communicate mathematically.

- b. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers and others.

MM3P4- Students will make connections among mathematical ideas and to other disciplines.

- h. Recognize and apply mathematics in contexts outside of mathematics.

National Academic Standards (NATEF)

SC041- Applies and uses laboratory safety techniques.

SC042- Applies and uses tables and graphs.

SC044- Applies and uses scientific method.

SC177- Describes explain Describes/explains heat s electricity.

SC180- Describes explains conductors.

SC182- Describes/explains current AC-DC.

SC184- Describes/explains electricity ground.

SC187- Describes/explains electricity short circuit.

SC197- Describes/explains electricity – generating transformers.

SC274- Describes/explains heat conduction and convection.

SC277- Describes/explains heat expansion and contraction.

SC278- Describes/explains heat fusion and vaporization.

SC282- Describes/explains heat temperature.

SC502- Measures electrical parameters.

SC520- Measures flow rate.

SC521- Describes/explains flow rate.

Implementation date

Fall 2010

MA128- Distinguishes angles/circles/arcs.

MA176- Interprets symbols.

MA182- Measures direct temperature.

MA229- Solves problems. Generates conclusions. Demonstrates deductive reasoning.

MA271- Determines proper operation.

MA273- Computes tolerances/ranges mentally.

MA274- Computes proper operations mentally.

ACCT-NSII-3. Plastics and Adhesives --- Students will be able to identify the type of plastics used on vehicles and repair them with manufacturer approved methods.

- a. Identify the types of plastics; determine repairability.
- b. Identify the types of plastic repair procedures; clean and prepare the surface of plastic parts.
- c. Replace or repair rigid, semi rigid, and flexible plastic panels.
- d. Remove or repair damaged areas from rigid exterior composite panels.
- e. Replace bonded rigid exterior composite body panels; straighten or align panel supports.

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Implementation date

Fall 2010

- b. Organize and consolidate their mathematical thinking through communication.
- c. Communicate their mathematical thinking coherently and clearly to peers, teachers and others.

MM3P4- Students will make connections among mathematical ideas and to other disciplines.

- i. Recognize and apply mathematics in contexts outside of mathematics.

National Academic Standards (NATEF)

SC041- Applies and uses laboratory safety techniques.

SC042- Applies and uses tables and graphs.

SC044- Applies and uses scientific method.

SC114- Describes/Explains chemical reactions.

SC116- Describes/Explains chemical reactions catalyst.

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading

Implementation date

Fall 2010

Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

- a. Reading in all curriculum areas
 - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
 - Read both informational and fictional texts in a variety of genres and modes of discourse.
 - Read technical texts related to various subject areas.
- b. Discussing books
 - Discuss messages and themes from books in all subject areas.
 - Respond to a variety of texts in multiple modes of discourse.
 - Relate messages and themes from one subject area to messages and themes in another area.
 - Evaluate the merit of texts in every subject discipline.
 - Examine author's purpose in writing.
 - Recognize the features of disciplinary texts.
- c. Building vocabulary knowledge
 - Demonstrate an understanding of contextual vocabulary in various subjects.
 - Use content vocabulary in writing and speaking.
 - Explore understanding of new words found in subject area texts.
- d. Establishing context
 - Explore life experiences related to subject area content.
 - Discuss in both writing and speaking how certain words are subject area related.
 - Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical

Implementation date

Fall 2010

Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

CTAE-FS-2 Academic Foundations: Learners achieve state academic standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.