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PROGRAM CONCENTRATION: Architecture, Construction,
Communications & Transportation
CAREER PATHWAY: Collision Repair
COURSE TITLE: Painting and Refinishing I
PREREQUISITE: Introduction to Collision Repair

Course Description: Painting and Refinishing I is the first course in the painting and refinishing strand of the collision repair that will teach the student skills and knowledge that will help him or her obtain a career in the automotive refinish 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 automotive refinish field.

Safety Precautions

ACCT-PRI-1. Safety---Students will comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power tools; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and environmental regulations. For every task in painting and refinishing these safety requirements must be strictly enforced.

- a. Identify and take necessary precautions with hazardous operations and materials according to federal state and local regulations.
- b. Identify safety and personal health hazards according to OSHA guidelines and the "Right to know Law".
- c. Inspect spray environments to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards.
- d. Select and use the NIOSH approved cartridge respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA regulations.
- e. Select and use the NIOSH approved (fresh air make- up system). Perform proper maintenance in accordance to OSHA regulations.
- f. Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects and detailing (gloves, suits, hoods, eye and ear protection, etc.).

Academic Standard(s):

SEV4- Students will understand and describe availability, allocation and conservation of energy and other resources.

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- c. Describe how energy and other resource utilization impact the environment and recognize that individuals as well as larger entities (businesses, governments, etc.) have impact on energy efficiency.
- e. Describe the commonly used fuels (e.g. fossil fuels, nuclear fuels, etc.) and some alter technology, availability, pollution problems and implementation problems. Recognize the origin of fossil fuels and the problems associated with our dependence on this energy source.

SEV5- Students will recognize that humans are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.

- c. Explain how human activity affect global and local sustainability.
- e. Describe the effects and potential implications of pollution and resource depletion on the environment at the global levels(e.g. air and water pollution, solid waste disposal, depletion of the stratospheric ozone, global warming, and land uses).
- f. Describe how political, legal, social, and economic decisions may affect global and local ecosystems.

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.

National Academic Standards (NATEF)

SC007- Analyzes and evaluates environmental issues

SC012- Analyzes / evaluates environmental issues such as waste management.

SC041- Applies and uses laboratory safety techniques.

ACCT-PRI-2. Surface prep---Students will be able to properly prepare a surface to be refinished. This will include trim removal, mechanical and chemical removal of worn refinish material, proper application of undercoats and cleaning of the surface before top coat application.

- a. Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.
- b. Soap and water wash the entire vehicle; use appropriate cleaner to remove contaminates.

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- c. Inspect and identify substrate, type of finish, surface condition, and film thickness: develop and document a plan for refinishing using a total product system.
- d. Remove paint finish.
- e. Dry or wet sand areas to be refinished.
- f. Featheredge damaged areas to be refinished.
- g. Apply suitable metal treatment or primer in accordance with paint system you are using.
- h. Mask and protect all other areas that are not being refinished.
- i. Mix primer, primer surfacer, or primer sealer.
- j. Apply primer onto surface of repaired area.
- k. Apply two component finishing filler to minor surface imperfections.
- l. Dry or wet sand area to which primer-surfacer has been applied.
- m. Dry sand area where two component filler has been applied.
- n. Remove dust from area to be refinished, including cracks or moldings of adjacent areas.
- o. Clean areas to be refinished with a final cleaning solution.
- p. Remove dust or lint particles on a surface to be refinished by using a tack rag.
- q. Apply suitable sealer to area being refinished when sealer is either needed or desirable.
- r. Scuff sand to remove nibs or imperfections from a sealer.
- s. Apply stone chip resistant coating.
- t. Restore corrosion resistant coatings, caulking, and seam sealer to repaired areas.
- u. Prepare adjacent panels for blending.
- v. Identify the types of plastic to be refinished; determine the materials, preparation, and refinishing procedures.

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

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SC5- Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst.

- a. Demonstrate the effects of changing concentration, temperature, and pressure on chemical reactions.
- b. Investigate the effects of a catalyst on chemical reactions and apply it to everyday examples.

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)

SC042- Applies and uses maps, charts, tables, and graphs.

SC044- Applies and uses the scientific method.

SC114- Describes and explains chemical reactions.

SC116- Describes chemical reactions with a catalyst.

SC121- Describes chemical reactions with an inhibitor.

SC213- Describes electro chemical reactions such as oxidation/reduction

SC395- Describes and explains solution and solvents.

SC443- Explain relative humidity.

SC497- Measures volume of liquids and solids.

SC499- Uses computers for processing and estimating information.

SC512- Describes and explains how contamination effects chemical reactions.

SC522- Applies and uses ratio and proportion mixtures.

SC531- Describes and explains viscosity.

MA028- Computes addition mentally.

MA126- Converts units from English to metric and metric to English.

MA161- Identifies English measurement: length / volume / weight.

MA171- Identifies Metric measurement: length / volume / weight.

MA182- Measures direct temperature.

MA184- Measures direct volume.

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

ACCT-PRI-3 Spray gun Operation and maintenance--- Students will know all the parts off a paint gun and be able to disassemble and reassemble a paint gun after cleaning. Students will be able to inspect and replace worn or broken parts of a paint gun.

- a. Inspect clean and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source and spray environment).
- b. Check and adjust spray gun operation for HVLP or LVHP guns.
- c. Set-up, adjust, and test spray gun using fluid, air, and pattern control valves.

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.

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

- e. Calculates amount of work and mechanical advantage using simple machines.

National Academic Standards (NATEF)

SC042- Applies and uses maps, charts, tables, and graphs.

SC255- Describes and explains force and pressure.

SC494- Measures pressure.

SC497- Measures volume of liquids and solids.

SC504- Describes and explains fluid systems (pneumatics).

SC520- Measures flow rate.

SC521- Describes and explains flow rate.

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

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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 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

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- 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 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.

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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.