

Implementation date

Fall 2010

PROGRAM CONCENTRATION:

CAREER PATHWAY:

COURSE TITLE:

**Healthcare Science
Personal Care Services
Cosmetology Science**

Course Description: This course is designed to enhance the students understanding of scientific concepts related to the cosmetology field. Student will explore various sciences in this course. Infection Control will be implemented throughout the course to adhere to the standards and guidelines to prevent the spread of infectious diseases. Students will examine the conditions, disorders and diseases of the hair, skin, and nails. The functions, cell growth, and reproduction will be included as well as instruction on how to maintain healthy hair, skin and nails. Bacteriology will be evaluated and how the spread of infectious microbes and diseases occur in the salon. Students will compare and contrast different body systems and how they affect the hair, skin and nails. Emphasis will be placed on classroom safety and professional work ethics.

Salon Safety

Students will learn the importance of safety in the salon. The student will draw upon experiences in the classroom/lab setting and further examine hazards in the workplace.

HS-CS-1. Students will explore state and federal laws and practice required safety protocol in the workplace, they will understand the risk involved when working with chemicals and other hazards that can be found in the salon.

- a. Interpret state and federal laws regarding safety in the workplace and explain purpose of OSHA, as well as the use of MSDS sheets.
- b. Describe basic salon safety rules and their purpose. They will also determine correct/incorrect settings in the salon.
- c. Explain toxicity and carcinogenicity as it relates to exposure in the salon.
- d. Determine the health effects that exist for short term and long term exposure to chemicals found in salons
- e. Demonstrate proper handling and storage of all chemicals and the sanitation of tools and equipment used in the salon.

Academic Standard(s):

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

- a. Exhibit the above traits in their own scientific activities.
- b. Recognize that different explanations often can be given for the same evidence.
- c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

- a. Follow correct procedures for use of scientific apparatus.
- b. Demonstrate appropriate techniques in all laboratory situations.
- c. Follow correct protocol for identifying and reporting safety problems and violations.

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HS-CS-2. Students will understand how science is used in cosmetology and predict the outcome of services using the three step scientific method.

- a. Investigate how science is used in cosmetology.
- b. Use the three step scientific method (observation, reasoning, and testing) to evaluate services that have been performed.
- c. Explain the relationship between cause and effects and its importance.
- d. Interpret scientific research to choose the proper products needed for the service that is to be performed.

Academic Standard(s):

SCSh3. Students will identify and investigate problems scientifically.

- a. Suggest reasonable hypotheses for identified problems.
- b. Develop procedures for solving scientific problems.

SCSh7. Students will analyze how scientific knowledge is developed.

Students recognize that:

- a. The universe is a vast single system in which the basic principles are the same everywhere.
- b. Universal principles are discovered through observation and experimental verification.

SCSh8. Students will understand important features of the process of scientific inquiry.

Students will apply the following to inquiry learning practices:

- b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.

Structure of Hair, Skin, and Nails

Students will understand anatomy and physiology exploring the structure of cells, hair, skin, and nails as well as systems of the body and explain why it is important for cosmetologist to have an understanding of the body.

HS-CS-3. Students will understand the basic structure of life. The student will examine the periodic table of elements, cells and their reproduction.

- a. Examine the periodic table of elements and explain the COHNS elements.
- b. Distinguish between organic and inorganic.
- c. Label and explain the function of each part of a cell.
- d. Diagram the phases of mitosis.
- e. Explain the relationship between hair growth and skin renewal through the reproduction of cells.

Academic Standard(s)

SPS1. Students will investigate our current understanding of the atom.

- a. Examine the structure of the atom in terms of proton, electron, and neutron locations.
 - atomic mass and atomic number.

SPS4. Students will investigate the arrangement of the Periodic Table.

SB1. Students will analyze the nature of the relationships between structures and functions in living cells.

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HS-CS-4. Students will demonstrate knowledge of anatomy as it relates to bone structure and muscle contours in haircutting, facial and shampooing services.

- a. Describe the importance of anatomy and physiology in the cosmetology profession.
- b. Define tissues and name the types of tissues found in the body.
- c. Demonstrate the proper massage procedures in manicure, pedicures, facial massage and shampooing services.
- d. Discriminate between different facial bone structures and muscle contours as it relates to haircutting, facials and make-up.
- e. Diagram the muscular system, explain the types of muscle tissue and the parts of the muscle.
- f. Define voluntary and involuntary muscles.
- g. Demonstrate the stimulation of muscle including massage, electrical current, light and heat rays, nerve impulses and chemicals.
- h. Explain the importance of the skeletal system, label the bones.
- i. Compare and contrast the 10 main body systems and their basic functions.

Academic Standard(s)

SAP1. Students will analyze anatomical structures in relationship to their physiological functions.

- a. Apply correct terminology when explaining the orientation of body parts and regions.
- b. Investigate the interdependence of the various body systems to each other and to the body as a whole.
- d. Relate cellular metabolism and transport to homeostasis and cellular reproduction.
- e. Describe how structure and function are related in terms of cell and tissue types.

SAP2. Students will analyze the interdependence of the integumentary, skeletal, and muscular systems as these relate to the protection, support and movement of the human body.

- a. Relate the structure of the integumentary system to its functional role in protecting the body and maintaining homeostasis.
- b. Explain how the skeletal structures provide support and protection for tissues, and function together with the muscular system to make movements possible.

SAP3. Students will assess the integration and coordination of body functions and their dependence on the endocrine and nervous systems to regulate physiological activities.

- a. Interpret interactions among hormones, senses, and nerves which make possible the coordination of functions of the body.
- c. Describe how the body perceives internal and external stimuli and responds to maintain a stable internal environment, as it relates to biofeedback.

SAP4. Students will analyze the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.

- a. Describe the chemical and physical mechanisms of digestion, elimination, transportation, and absorption within the body to change food and derive energy.
- e. Describe the effects of aging on body systems.

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HS-CS-5. Students will understand bacteriology, disease, infection, and be able to demonstrate safety precaution to reduce the risks of bloodborne pathogens.

- a. Describe the two types of bacteria: pathogenic and nonpathogenic.
- b. Examine where people come into contact with bacteria.
- c. Label the classification of bacteria; cocci, bacilli, and spirilla and explain the illness that relates.
- d. Describe the growth, reproduction, and movement of bacteria.
- e. Compare and contrast bacterial illness and viruses.
- f. Describe Acquired Immune Deficiency Syndrome (AIDS) and Human Immunodeficiency Virus (HIV) and how it is spread. Determine the ways the disease can be spread in a salon setting and the importance of sanitary practices.
- g. Distinguish between local and general infections.
- h. Define contagious and immunity, explain the different types of immunity.

HS-CS-6. Students will understand the structure of the skin and recognize skin disease and be able to refer clients to a physician if needed.

- a. Label the layers of the skin.
- b. Explain the different types of nerves, (sensory, secretory, and motor) and how the skin is receptive to stimulation.
- c. Define exocrine, endocrine and sebaceous glands explain the purpose.
- d. Explain the role sebum has in keeping the skin healthy through Natural Moisturizing Factor (NMF).
- e. Explain factors that determine the color of the skin.
- f. Investigate the effects of UV, UVC, UVB, UVA rays on the skin and the use of Sun Protection Factor (SPF) to combat harmful rays.
- g. Explain Irritant contact dermatitis and the risk associated with cosmetologist.
- h. Explain Allergic Contact Dermatitis and the risk associated with clients.
- i. Analyze the skin and scalp to determine if there is evidence of skin disorders, diseases, or infections and determine if performing the requested service is advisable.

Academic Standard(s):

SAP3. Students will assess the integration and coordination of body functions and their dependence on the endocrine and nervous systems to regulate physiological activities.

- a. Interpret interactions among hormones, senses, and nerves which make possible the coordination of functions of the body.
- c. Describe how the body perceives internal and external stimuli and responds to maintain a stable internal environment, as it relates to biofeedback.

SAP4. Students will analyze the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.

- a. Describe the chemical and physical mechanisms of digestion, elimination, transportation, and absorption within the body to change food and derive energy.
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HS-CS-7. Students will understand the structure and properties of the hair. Students will examine normal hair growth and hair loss. This will enable the student to provide information to their client on the proper course of action to take if they experience hair loss.

- a. Identify the different types of hair. (vellus, terminal, etc.)
- b. Describe the hair growth cycles (anagen, catagen, telogen) phase.
- c. Explain normal and abnormal hair loss as well as the normal growth rate of hair.
- d. Identify the layers of the hair shaft; explain the importance of each layer.
- e. Determine the chemical composition of hair.
- f. Label the hair follicle and explain the purpose of each part.
- g. Examine the protein structure of the hair, the parts of the polypeptide chain.
- h. Explain the purpose of side bonds and how they are broken as well as what effects can be achieved through the breaking of the bonds.
- i. Perform hair and scalp analysis to determine density, texture, porosity.

Chemistry

Students will explore basic chemistry concepts and determine their relation to shampoo, haircolor, styling aids and other chemicals used in the salon. Student will investigate concepts involving solutions, mixtures, and chemical reactions. They will be able to relate these concepts to chemical services performed in the salon.

HS-CS-8. Students will be able to use basic chemistry concepts when using chemicals in the salon; they will explain the chemical process of permanent wave procedures and chemical hair relaxer.

- a. Distinguish between the three types of matter.
- b. Compare and contrast physical and chemical change.
- c. Explain how (REDOX) oxidation reaction occurs.
- d. Perform permanent wave and chemical hair processing services to explain the chemical reduction reactions and how it takes place within these services.
- e. Determine the active ingredient and the required processing temperature to achieve optimum results for varies types of hair.
- f. Identify solutions, mixtures, emulsions and suspensions.
- g. Explain the pH scale, determine the different effects of pH on hair and skin.

Academic Standard(s)

SC1 Students will analyze the nature of matter and its classifications.

- b. Identify substances based on chemical and physical properties.

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.

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SC7. Students will characterize the properties that describe solutions and the nature of acids and bases.

- a. Explain the process of dissolving in terms of solute/solvent interactions:
 - Observe factors that affect the rate at which a solute dissolves in a specific solvent
- b. Compare, contrast, and evaluate the nature of acids and bases:
 - pH
 - Acid-Base neutralization

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, gases and plasmas.
- b. Relate temperature, pressure, and volume of gases to the behavior of gases.

SPS6. Students will investigate the properties of solutions.

- a. Describe solutions in terms of solute/solvent.
- b. Observe factors affecting the rate a solute dissolves in a specific solvent.
- d. Compare and contrast the components and properties of acids and bases.
- e. Determine whether common household substances are acidic, basic, or neutral.

HS-CS-9. Students will understand the chemistry of shampoo, the roles of the surfactant molecule and investigate the ingredients found in shampoos, conditioners and styling products and how to determine the appropriate product for your client.

- a. Perform shampooing services and explain the role of the surfactant molecule.
- b. Define surface tension, hydrophilic, lipophilic.
- c. Perform shampoo services using different types of shampoos and examine their results.
- d. Identify the types of ingredients and their use that are most commonly found in shampoo, conditioner, and styling products and the effects they have on the hair.

HS-CS-10. Student will understand the chemical reaction that takes places during haircolor and hair lightener services.

- a. Explain The Law of Color.
- b. Predict the levels of a variety of hair types before and after a haircolor/hair lightener services is performed.
- c. Determine the natural level of hair and explain the two types of melanin found in the cortical layer.
- d. Describe the chemical reaction that takes place during haircolor/lightening services and the use of an oxidizer at various volumes.

Academic Standard(s)

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.

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- b. Investigate the effects of a catalyst on chemical reactions and apply it to everyday examples.

HS-CS-11. Students will perform salon services master in previous coursework. They will apply new scientific knowledge and develop an understanding of the benefits having this knowledge.

- a. Demonstrate chemical services. (haircolor, chemical texture services, chemical hair relaxers)
- b. Perform facial and skin care services.
- c. Demonstrate massage techniques for the hands, scalp, and feet.
- d. Demonstrate shampoo services.

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 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.

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- 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 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

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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.