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Wisconsin Indianhead Technical College

31806310 Science for Cosmetologists

Course Outcome Summary

Course Information

Alternate Title	previously 31806310 Natural Sciences
Description	This course explores the fundamental concepts of physics, chemistry, human anatomy, physiology, and disease. Students examine and learn to apply scientific methods and reasoning to develop problem-solving skills. This course provides the student with a broad, integrated understanding of the impact of the various sciences on cosmetology processes, and prepares the participant to apply scientific principles in the cosmetology field.
Instructional Level	One-Year Technical Diploma
Total Credits	3.00
Total Hours	80.00

Types of Instruction

Instruction Type	Credits/Hours
Classroom Presentation (Lecture/Demonstration/Discussion)	1/16
On-Campus Lab and/or Shop Experience	2/64

Course History

Revised By	Erin Winesburg (15237468)

Course Competencies

1.   Describe basic principles in chemistry
Domain Cognitive   *Level*   Comprehension   *Status*   Active

Assessment Strategies
1.1.   verbally and/or in writing
1.2.   in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:
1.1.   learner illustrates subatomic particles within an atom

1.2.   learner illustrates relative relationships between subatomic particles in an atom
1.3.   learner determines mass using the periodic table
1.4.   learner determines atomic number using the periodic table

Learning Objectives
1.a.   Define matter and its various physical states
1.b.   Describe the properties and positions of particles that comprise an atom
1.c.   Describe the formation of a covalent bond

2.   Apply basic physics concepts
Domain   Cognitive   Level   Application   Status   Active

Assessment Strategies
2.1.   verbally and/or in writing
2.2.   in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:
2.1.   learner compares and contrasts physical and chemical changes of matter
2.2.   learner describes energy (kinetic and potential)
2.3.   learner defines terms relating to electrical current and conductivity: watts, amperes, and voltage
2.4.   learner describes light wavelength
2.5.   learner defines on color absorbance and prism refraction

Learning Objectives
2.a.   Describe kinetic and potential energy
2.b.   Define terms as they relate to electrical current: voltage, amperes, watts, etc.
2.c.   Discuss light wavelength
2.d.   Describe color absorbance and refraction

3.   Describe fundamentals of inorganic chemistry
Domain   Cognitive   Level   Comprehensi   Status   Active
                                          on

Assessment Strategies
3.1.   verbally and/or in writing
3.2.   in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:
3.1.   learner predicts pH of substances based upon elemental or molecular makeup

Learning Objectives
3.a.   List characteristics of acidic substances
3.b.   List characteristics of basic/alkaline substances
3.c.   Determine pH of substances

4.   Predict reaction types and products based upon participating elements
Domain   Cognitive   Level   Evaluation   Status   Active

Assessment Strategies
4.1.   verbally and/or in writing
4.2.   in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:
4.1.   learner predicts products of chemical reactions
4.2.   learner balances chemical equations
4.3.   learner predicts products from oxidation-reduction reactions

Learning Objectives

4.a.	Balance reaction equations
4.b.	Describe oxidation reactions
4.c.	Give examples of oxidizing agents
4.d.	Describe reduction reactions
4.e.	Give examples of reducing agents

5. Describe fundamentals of organic chemistry

Domain   *Cognitive*   *Level*   *Synthesis*   *Status*   *Active*

Assessment Strategies

5.1.	verbally and/or in writing
5.2.	in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:

5.1.	learner describes sources of carbohydrates, lipids, and proteins
5.2.	learner identifies carbohydrates, lipids, and proteins based upon molecular structure
5.3.	learner balances equations for carbohydrates, lipids, and proteins
5.4.	learner identifies primary, secondary, tertiary, and quaternary protein structure and bonds responsible for each
5.5.	learner identifies substances and/or conditions that cause denaturation of proteins

Learning Objectives

5.a.	Give examples of proteins, their sources, and common uses
5.b.	Give examples of carbohydrates, their sources, and common uses
5.c.	Give examples of lipids, their sources, and common uses
5.d.	Identify primary, secondary, tertiary, and quaternary structure of proteins
5.e.	Recognize factors that cause proteins to be denatured

6. Identify components of human cells and their functions

Domain   *Cognitive*   *Level*   *Evaluation*   *Status*   *Active*

Assessment Strategies

6.1.	verbally and/or in writing
6.2.	in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:

6.1.	learner identifies major organelles of the human cell
6.2.	learner recognizes major cell organelles in a visual diagram
6.3.	learner characterizes the stages and events of mitosis
6.4.	learner describes the function of each of the major organelles of the human cell

Learning Objectives

6.a.	Diagram a typical human cell including the following components: cell membrane, mitochondria, endoplasmic reticulum, ribosome, lysosome, centrosome, and nucleus
6.b.	Describe the functional role of each of the following cellular components: cell membrane, mitochondria, endoplasmic reticulum, ribosome, lysosome, centrosome, and nucleus
6.c.	List the stages in cell division (mitosis) and relevant occurrences in each stage

7. Describe the major structural and functional features of each body system

Domain   *Cognitive*   *Level*   *Comprehension*   *Status*   *Active*

Assessment Strategies

7.1.	verbally and/or in writing
7.2.	in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:

7.1.	learner identifies components of the integumentary system and associated glands

7.2. learner identifies components of the skeletal system
7.3. learner identifies components of the muscular system
7.4. learner identifies components of the nervous system
7.5. learner identifies components of the endocrine system
7.6. learner identifies components of the cardiovascular system
7.7. learner identifies components of the respiratory system
7.8. learner identifies components of the immune system
7.9. learner identifies components of the urinary system
7.10. learner identifies components of the reproductive system
7.11. learner identifies components of the excretory system

Learning Objectives
7.a. Name the major organ systems of the human body
7.b. Identify major organs and relevant ancillary structures of each body system
7.c. Characterize the functions of each major body system

8. Describe the structure of the protein, keratin, and its molecular arrangement in hair, skin, and nails

Domain   Cognitive   *Level*   Comprehension   *Status*   Active

Assessment Strategies
8.1. verbally and/or in writing
8.2. in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:

8.1. learner identifies components of the epidermis, dermis, and subcutaneous layers
8.2. learner lists the functions of skin
8.3. learner identifies unique characteristics of the protein keratin
8.4. learner describes the arrangement of keratin in skin cells
8.5. learner describes the arrangement of keratin in hair
8.6. learner describes the arrangement of keratin in nails

Learning Objectives
8.a. Characterize functions of the skin
8.b. Identify components of the epidermis, dermis, and subcutaneous layer
8.c. Describe the nature of the keratin molecule
8.d. Describe the arrangement of keratin in skin cells
8.e. Describe the arrangement of keratin in the hair shaft
8.f. Describe the arrangement of keratin in the nails

9. Characterize potential pathogens of the skin, hair, and nails

Domain   Cognitive   *Level*   Analysis   *Status*   Active

Assessment Strategies
9.1. verbally and/or in writing
9.2. in the classroom and laboratory

Criteria

Criteria - Performance will be satisfactory when:

9.1. learner identifies major structural features of bacteria
9.2. learner identifies major structural features of fungi
9.3. learner describes the basic physiology of skin pathogens
9.4. learner characterizes diseases of the skin, hair, and nails
9.5. learner describes methods of microbial control
9.6. learner lists common preventative methods for diseases of the skin, hair, and nails

Learning Objectives
9.a. Compare bacterial and fungal cells to human cells
9.b. Identify common bacterial diseases of the skin, hair, and nails

9.c.   Characterize fungal diseases of the skin, hair, and nails
9.d.   Describe prevention and treatment protocols for bacterial and fungal diseases of the skin, hair, and nails