VALLEY ROP COURSE OUTLINE

# COURSE TITLE: Veterinary Science 1

**VALLRY ROP #:** AG-4020-Vet1

**CDE #:** 454

**CBEDS TITLE:**  Animal Science

**CBEDS #:** 4020

**CTE SECTOR:** Agriculture & Natural Resources

**CTE PATHWAY:** Animal Science

## JOB TITLES: NonFarm Animal Caretakers 39-2021.00

Farm Workers, Farm & Ranch Animals 45-2093.00

First-line Supervisor/Managers of Animal Husbandry & Care-works 45-1011.08

Animal Breeders 45-2021.00

Horse Rancher Sheep Rancher

Livestock Rancher

Sales Representative, Wholesale &

Manufacturing, Technical & Scientific

Products 41-4011.00

Sales Representative, Wholesale &

Manufacturing, Except Technical &

Scientific Products 41-4012.00

Retail Sales Person (pet shop) 41-2031.00

**DATE APPROVED:** January 2004

**REVISED DATE(S):** December 2008 / March 2009/Oct 2009/March 2014

**HOURS:** 180 per year

**CREDITS:** 10 per year

**PREREQUISITES:** Agriculture Biology or Biology

**ARTICULATION(S):**  None

**COURSE DESCRIPTION:**

This course provides students with knowledge and hands-on application with both large and small animals. It covers anatomy and physiology, basic animal skills, animal health and sanitation, infectious diseases identification and control, breeding and breeding systems, feed and nutrition, environment and ecology, marketing of animals/livestock evaluation, financial planning and record keeping, and clinical practices. It explores careers in veterinary sciences. The course takes the students from basic through advanced training and experience in services related to raising and caring of animals.

* Animal Health and Sanitation
* Reproductive Physiology
* Large and Small Animal Anatomy and Physiology
* Breeding and Breeding Systems
* Parturition
* Feeds & Nutrition
* Infectious Disease Identification & Control
* Livestock Evaluation
* Animal Handling
* Career Opportunities and Portfolio Development
* Genetics
* Cell Biology
* Marketing of Animals
* Financial Business Planning and Record Keeping

**TEXTBOOKS:** *Introduction to Veterinary Sciences*, Meecee Baker, James Lawhead Del Mar Publishers, 2005

*The Science of Agriculture, A Biological Approach*, *Ray Herren,*

Del Mar Publishers, 1998

*Delmar’s Veterinary Technician Dictionary*, *Ray Herron,*

*Janet Amunndson Romich* Del Mar Publishers, 2000

**COURSE COMPETENCIES:**

Upon completion of this course, the student will:

* Students will demonstrate knowledge of the systems that make up the anatomy and physiology of animals
* Students will demonstrate knowledge of history/evolution, care and management of the systems of various animal species
* Students will be able to demonstrate knowledge of breeding and genetics as it relates to animals and humans
* Students demonstrate clinical practices as it relates to veterinarian care to animals
* Students will demonstrate knowledge of common diseases and disease prevention as it relates to animal care
* Student will be exposed to educational and industry opportunities as it relates to the field of study in this course
* Students will develop a portfolio and us it in for higher education and employment
* Students will be prepared academically and technically for: four year college, technical training and employment

**INSTRUCTIONAL METHODS:**

* Lecture
* Discussion
* Demonstration
* Group and Individual Research Projects through use of technology
* Content Based Exams
* Field Trips
* Guest Speakers
* Hands on Application through Lab Procedures

**EVALUATION METHODS:**

Assessment opportunities, which allow continuous evaluation of students’ progress, will be embedded throughout the course and should be a learning experience. All students will be expected to achieve mastery of all topics; often, demonstrations of mastery will occur in a public forum. Students will be expected to demonstrate knowledge and skill competencies in a variety of ways.

The following strategies, which include both formal and informal assessment techniques will include, but are not limited to:

* + Quizzes
  + Unit Exams
  + Semester Exams
  + Homework
  + Class Discussion
  + Special Assignments and Projects
  + Specialty Project
  + Lab Exercises
  + Demonstration
  + Portfolio and Interactive Notebook

**COURSE OUTLINE:**

**Unit of Instruction Estimated Hours**

**Class / Lab**

**Introduction**

**3 3**

* Purpose of course/outline
* Grading, Tests and Classroom/Laboratory Procedures
* Introduction to Portfolio and Inter Active Notebook
* Attitude and Ethics in classroom and industry

**Basic Animal Skill 3 3**

* Safety (animals, medications, chemicals, first aid and fire)
* Handling, transporting, and restraint of large and small animals
* Basic breed and external anatomy identification of large and small animals

**Anatomy and Physiology**

* Cell Biology **3 1**
  + Cell Makeup, Structure and Function
  + Mitosis and Cancer
  + Mammal Reproduction
  + Clinical Practices
* Tissue Types and Functions **3 1**
  + Epithelial
  + Connective
  + Muscle
  + Nerve
  + Clinical Practices
* Musculoskeletal System **3 1**
  + Bone Structure
  + Joint types and Movement
  + Axial and Appendicular Skeletons
  + Bone Growth and Remodeling
  + Clinical Practices
* Circulatory System **3 1**
  + Blood Components and Functions
  + Mammal Heart Functions
  + Blood Vessels and Blood Flow
  + Electrocardiograms, Heart Sounds and Blood Pressure
  + Clinical Practices
* Respiratory System **3 1**
  + The Respiratory Tract
  + Mechanism of Breathing
  + Clinical Practices
* Renal System **3 1**
  + Renal Functions
  + Kidney Structures and Urine Regulation
  + Urine and Blood Evaluation
  + Clinical Practices
* Digestive System **3 1**
  + Digestive System Structures
  + Monogastric and Ruminant Digestion
  + Clinical Practice
* Endocrine System **3 1**
* Function of Glands and Hormones
* Nervous System **3 1**
* Brain Functions
* Lymphatic System **3 1**
* Functions of the Lymphatic System

**Reproductive Physiology 5 2**

* Genetics
* Gene Transfer
* Animal Breeding
* Social Concerns
* Terminology
* Male Anatomy
  + Parts of the male reproductive system
  + Functions of the male reproduction
  + Spermatogenesis
* Female Anatomy
  + Parts of the female reproductive system
  + Functions of the female reproduction
  + Ogenesis

**Gestation and Parturition 6 2**

* Pre-Partum Care
* Difficult Births
* Normal Births
* Post-Partum Care

**Animal Health and Sanitation 10 5**

* Animal Health Evaluation
* Posture and Stance
* Movement and Voice
* Appetite
* Sexual Activity
* Maintaining Animal Health
* Disease Concept
* Animal Management Steps
* Housing
* Exercise and Sunlight
* Sanitation of eating utensils
* Pasture Rotation
* Proper Feeding Techniques
* Disease Prevention and Control
* Cleaning and Disinfectants
* Procedures and Disinfections
* Types of Disinfections
* Applying Disinfectants

**Infectious Diseases Identification**

**& Control 20 9**

* Non-Living Agents
* Trauma
* Toxins
* Bacterial Toxins
* Zootoxins
* Phytotoxins
* Living Agents
* Bacteria
* Fungi
* Virus
* Protozoa
* Internal Parasites
* External Parasites
* Spread of Disease
* Direct Contact
* Indirect Contact
* Carrier Animals
* Contaminant Soils
* Contaminated Food or Water
* Air-born Infection
* Vector Infections
* Protection against Disease
* Resistance
* Immunity
* First Line of Defense
* Bleeding
* Phagocytes
* Inflammation
* Secondary Defense
* Disease Control

**Bacteria and Disease 3 2**

* General Characteristics
* Diploccus
* Staphlococcus
* Streptococccus
* Bacteria and their Structure
* Bacterial Spores
* Bacterial Diseases

**Viruses and Viral Disease 3 2**

* Classification of Viruses
* Control of Viruses
* Characteristics

**External Parasites 3 2**

* External Parasites and Disease
* Types
* Life Cycles
* Prevention and Management

**Internal Parasites 5 2**

* Types
* Characteristics and Life Cycles
* Prevention and Management
* Internal Parasite and Disease
* Internal Parasites in Small and Large Animals

**Other Disease Factors 5 2**

* Nutrition and Disease
* Poison and Disease
* Stress and Disease
* Heredity and Disease
* Environment and Disease

**Breeding and Breeding System 2 2**

* Types of Breeding
* Management
* Clinical Practices

**Feed and Nutrition 7 4**

* Digestive Systems of Animal and Poultry
* Ration Formulation
* Roughages and Concentrates
* Macro/Micro Nutrients
* Feed Labels and Labeling
* Pet Food Labels
* Basic Feeds and Feeding
* Nutrients
* Protein, Fats and Carbohydrates
* Minerals
* Fibers
* Vitamins

**Environment and Ecology 5 2**

* Environmental Relationships
* Wildlife Management
* Plant/Animal Relationships

**Marketing of Animals/Livestock Evaluation**

* Finished Animals
* Weaned Animals
* Yearlings
* Breeding Stock Types
* Livestock Evaluation
* Breeding Stock
* Market Animals
* Carcass Evaluation and Breakdown

**Financial Planning & Record Keeping 2 2**

* Loans
* Tax Planning
* Profit and Loss
* Public Relations

**Career Opportunities & 5 3**

**Portfolio Development**

* Career Opportunities
* Careers in Veterinary Sciences
* Further Education
* Industry Opportunities
* Portfolio Development
* Higher Education Application
* Employment Applications
* Letters of Introduction
* Resume
* Interview Practices
* Work Samples
* Interactive Notebooks

**Clinical Practices 7 3**

* Medical Terminology
* Lab Skills
* Pharmacology
* Radiology
* Medical Records
* Administration of Medications
* Common Surgical Practices

**Total Hours** **123 Class Hours 57 Lab Hours**

**Other Course Information**

* Key Assignments
  + Specialty Area Assignment
  + Animal Dissections
  + Construct a Model of DNA
  + Speech on Animal Rights
  + Vaccinations of various animals for diseases
  + Study of Internal Parasites
* Certificates
* To earn ROP Certification for this course, the student must complete one full year (two semesters) with a grade of C or better.

**Academic Standards**

State high school standards applicable to ROP Veterinary Science I

### Biology/Life Sciences Content Standards

**Cell Biology**

Standard 1.0 The fundament

Course Outline and State Standads

| Unit of Instruction | Key Assignments | Anchor Standards | Pathway  Standards | Common Core Standards |
| --- | --- | --- | --- | --- |
| Introduction   * Purpose of course/outline * Grading, Tests and Classroom/Laboratory Procedures * Introduction to Portfolio and Inter Active Notebook * Attitude and Ethics in classroom and industry |  |  |  | WS 9-10.4,7,8  WS11-12.4,7  WS11-12.9-10  LS1.D  PE 12.4.3 |
| Basic Animal Skill   * Safety (animals, medications, chemicals, first aid and fire) * Handling, transporting, and restraint of large and small animals * Basic breed and external anatomy identification of large and small animals | Students are introduced to animal safety.  Handling, herding and restraining the farm domesticated farm animals. Students will then demonstrate skills leaned on the animals on the school farm. Students will the critic each other on the positive methods that work for them and were human for the animals. | 3  5  6  7  9  11 | D1.1-4 | RLST 9-10.5,7  RLST 1-12.4  WS 9-10.4,7-9  WS 11-12.4,7,9,10  F-IF 4  S-IC 1,3,5  S-ID 1,2,7  LS1.D  PE 12.1.1-4  PE 12.2.1-6,8,10  PE 12.4.3 |
| Anatomy and Physiology  Cell Biology  Cell Makeup, Structure and Function  o Mitosis and Cancer  o Mammal Reproduction  o Clinical Practices  Tissue Types and Functions  o Epithelial  o Connective  o Muscle  o Nerve  o Clinical Practices  Musculoskeletal System  o Bone Structure  o Joint types and Movement  o Axial and Appendicular Skeletons  o Bone Growth and Remodeling  o Clinical Practices  Circulatory System  o Blood Components and Functions  o Mammal Heart Functions  o Blood Vessels and Blood Flow  o Electrocardiograms, Heart Sounds and Blood Pressure  o Clinical Practices  Respiratory System  o The Respiratory Tract  o Mechanism of Breathing  o Clinical Practices  Renal System  o Renal Functions  o Kidney Structures and Urine Regulation  o Urine and Blood Evaluation  o Clinical Practices  Digestive System  o Digestive System Structures  o Monogastric and Ruminant Digestion  o Clinical Practice  Endocrine System  o Function of Glands and Hormones  Nervous System  o Brain Functions  Lymphatic System  o Functions of the Lymphatic System | Students will review the biological and anatomy and physiology of the animal system.  Students will then observe and manipulate the different body systems as they butcher animals for meat production. They observe the different muscles, skeletal, circulatory, respiratory, and renal and digestive systems when butchering animals in class. Students will also cut and wrap the animals butchered for customers and they will see further manipulation of the systems for human use. | 3  4  6  7  8  11 | D3.1-3 | RLST 9-10.5  RLST 1-12.4  WS 9-10.4,7-9  WS 11-12.4,7,9,10  F-IF 4  S-IC 1,3,5  S-ID 1,2,7  LS4:C,D  PE 12.2.1-10  PE 12.4.3-4  PE 12.6.1-4 |
| Reproductive Physiology  Genetics  o Gene Transfer  o Animal Breeding  o Social Concerns  o Terminology  Male Anatomy  o Parts of the male reproductive system  o Functions of the male reproduction  o Spermatogenesis  Female Anatomy  o Parts of the female reproductive system  o Functions of the female reproduction  o Ogenesis | Students will review animal breeding and the anatomy of the male and female. Students will be in charge of a ewe heard and will set up a breeding schedule for the season. Students will set up a care and feed regiment, treatment schedule for the entire gestation period. | 3  4  8 | D4.1-5 | RLST 9-10.5,7  WS 9-10.4,7-9  WS 11-12.4,7,9  F-IF 4  S-IC 1,3,5  S-ID 1,2,7  PE12.2.2,3,5,8 |
| Gestation and Parturition  Pre-Partum Care  Difficult Births  Normal Births  Post-Partum Care | Students will share responsibilities for the Pre-partum care set schedules to care for the birthing time. Students will observe the biting time and will be instructed on help that they can do for the difficult or abnormal births. Students will set schedule’s for post partum care of the lambs and the ewes | 3  4  5  6  8  10 | D4.1-5 | RLST 9-10.5  RLST 1-12.4  WS 9-10.4,7-9  WS 11-12.4,7,9,10  F-IF 4  S-IC 1,3,5  S-ID 1,2,7  PE 12.2.1-10  PE 12.4.3 |
| Animal Health and Sanitation  Animal Health Evaluation  o Posture and Stance  o Movement and Voice  o Appetite  o Sexual Activity  Maintaining Animal Health  o Disease Concept  o Animal Management Steps  Housing  Exercise and Sunlight  Sanitation of eating utensils  Pasture Rotation  o Proper Feeding Techniques  o Disease Prevention and Control  Cleaning and Disinfectants  o Procedures and Disinfections  o Types of Disinfections  o Applying Disinfectants | Students will perform bi-weekly-monthly physical exams on different types of animals. They will perform regular tests and use equipment and tools used in the Veterinary Industry. | 3  4  5  6  8  10  11 | D.1.1-4  D.8.1-3 | RLST 9-10.5,7  WS 9-10.4,7-9  WS 11-12.4,7,9  F-IF 4  S-IC 1,3,5  S-ID 1,2,7  PE12.2.2,3,5,8 |
| Infectious Diseases Identification  & Control  Non-Living Agents  o Trauma  o Toxins  Bacterial Toxins  Zootoxins  Phytotoxins  Living Agents  o Bacteria  o Fungi  o Virus  o Protozoa  o Internal Parasites  o External Parasites  Spread of Disease  o Direct Contact  o Indirect Contact  o Carrier Animals  o Contaminant Soils  o Contaminated Food or Water  o Air-born Infection  o Vector Infections  Protection against Disease  o Resistance  o Immunity  First Line of Defense  o Bleeding  o Phagocytes  Inflammation  Secondary Defense  Disease Control | Students will review Infectious diseases and parasites.  Students will plan a schedule for disease and parasite control for the sheep herd.  Students will put in to use the above plan and implement it. They will give the dosed to the sheep with a drench or injection methods.  Students are taught and shown the need to quarantine animals introduced or coming into the herd. | 3  4  5  6  7  8  10 | D.6.1-7 | ELA-11-12.3, 11-12.4  RLST-11-12.3  WS-11-12.4, 11-12.711-12.9, 11-12.10  F-IF- 4  S-IC-3  G-MG-2  CC-1-7  SEP- 1-8  PS3.D |
| Bacteria and Disease  General Characteristics  o Diploccus  o Staphlococcus  o Streptococccus  Bacteria and their Structure  Bacterial Spores  Bacterial Diseases  Viruses and Viral Disease  Classification of Viruses  Control of Viruses  Characteristics |  | 3  4  5  6  7  8  10 | D.6.1-7 | RLST 9-10.5  RLST 1-12.4  WS 9-10.4,7-9  WS 11-12.4,7,9,10  F-IF 4  S-IC 1,3,5  S-ID 1,2,7  PE 12.2.1-10  PE 12.4.3-4 |
| External Parasites  External Parasites and Disease  Types  Life Cycles  Prevention and Management | Students are to incorporate there control plan to control external parasites.  They will learn their life cycles and how to break the cycle. | 4  5  6  7  11 | D.6.1-7 | ELA-11-12.3, 11-12.4  RLST-11-12.3  WS-11-12.4, 11-12.711-12.9, 11-12.10  F-IF- 4  S-IC-3  G-MG-2  CC-1-7  SEP- 1-8  PS3.D |
| Internal Parasites  Types  Characteristics and Life Cycles  Prevention and Management  Internal Parasite and Disease  Internal Parasites in Small and Large Animals | Students are to incorporate their control plans to include the prevention and preventative control of internal parasites | 4  5  6  7  11 | D.6.1-7 | ELA-11-12.3, 11-12.4  RLST-11-12.3  WS-11-12.4, 11-12.711-12.9, 11-12.10  F-IF- 4  S-IC-3  G-MG-2  CC-1-7  SEP- 1-8  PS3.D |
| Other Disease Factors  Nutrition and Disease  Poison and Disease  Stress and Disease  Heredity and Disease  Environment and Disease | Students will be exposed to the other disease factors as: stress, poisonous plants, feed and other environmental factors. | 4  5  6  7  11 | D.6.1-7 | ELA-11-12.3, 11-12.4  RLST-11-12.3  WS-11-12.4, 11-12.711-12.9, 11-12.10  F-IF- 4  S-IC-3  G-MG-2  CC-1-7  SEP- 1-8  PS3.D |
| Breeding and Breeding System  Types of Breeding  Management  Clinical Practices | Students are taught the different options of breeding systems and clinical, management need and practices.  Natural  Artificial insemination  Embryo transfer | 3  4  5  10 | D4.1-5 | RLST9-10.3, 9-10.5, 9-10.7, 11-12.3-4  WS9-10.4, 9-10.7-9, 11-12.4, 11-12.7, 11-12.9-10  IF4  S-ID1, 2, 7  G-MG2  SEP8  CC1  LS1.D  PE12.1.1-4, 12.2.1-6, 12.2.8, 12.2.10 |
| Feed and Nutrition  Digestive Systems of Animal and Poultry  Ration Formulation  Roughages and Concentrates  Macro/Micro Nutrients  Feed Labels and Labeling  Pet Food Labels  Basic Feeds and Feeding  Nutrients  o Protein, Fats and Carbohydrates  o Minerals  o Fibers  o Vitamins | Students learn about different animals and their nutritional need. Students are assigned a week in which they are responsible for all the nutritional need of a group of lambs.  Students must understand the feed needs and the feed label of the feed and understand the nutritional needs and quantity of feed the lambs need to gain weight.  They will also learn about a feeding schedule and the important of feeding regularly. | 2  3  5  7  8  9  11 | D.2.1-4 | RLST9-10.3, 9-10.5, 9-10.7, 11-12.3-4  WS9-10.4, 9-10.7-9, 11-12.4, 11-12.7, 11-12.9-10  LS1.D |
| Environment and Ecology  Environmental Relationships  Wildlife Management  Plant/Animal Relationships | Students will understand the importance pasture animal relationship and the balance needed | 5  8 | D.7.1-4 | RLST9-10.3, 9-10.5, 9-10.7, 11-12.3-4  WS9-10.4, 9-10.7-9, 11-12.4, 11-12.7, 11-12.9-10 |
| Marketing of Animals/Livestock Evaluation  Finished Animals  Weaned Animals  Yearlings  Breeding Stock Types  Livestock Evaluation  o Breeding Stock  o Market Animals  o Carcass Evaluation and Breakdown | Students with the feeder lamb project will have to finish a set of lambs for butcher and then be able to market those animals to the local and regional market place.  Students in the market project evaluate the lambs with external evaluations with their hands and ultrasound. They also evaluate the lambs carcasses before the cut and wrap process.  With the breeding ewe project they learn the importance of creep feeding and then the weaning process. | 2  3  4  5  6  7  9 | D.9.1-3 | RLST9-10.3, 9-10.5, 9-10.7, 11-12.3-4  WS9-10.4, 9-10.7-9, 11-12.4, 11-12.7, 11-12.9-10  IF4  S-ID1, 2, 7  G-MG2  SEP8  CC1  LS1.D  PE12.1.1-4, 12.2.1-6, 12.2.8, 12.2.10 |
| Financial Planning & Record Keeping  Loans  Tax Planning  Profit and Loss  Public Relations | Students are required to keep a record book on these projects. | 2  4  5  7  11 | D.1.1-3 | RLST9-10.3-5, 9-10.7, 11-12.3-4  WS9-10.7-9, 11-12.7, |
| Career Opportunities &  Portfolio Development  Career Opportunities  o Careers in Veterinary Sciences  o Further Education  o Industry Opportunities  Portfolio Development  o Higher Education Application  o Employment Applications  o Letters of Introduction  o Resume  o Interview Practices  o Work Samples  Interactive Notebooks | Students will prepare collection of work that will include a resume, cover letter and job application.  Students will answer questions through an interview and do a demonstration on basic skills and practices  through veterinary science . Students will compile score sheets and rubrics through this process. | 1  2  3  4  7  9  10 | D1.5  D2.4  D3.3  D9.3  D10.1-5  D11.1-4 | RLST9-10.3-5, 9-10.7, 11-12.3-4  WS9-10.7-9, 11-12.7, 11-12.9-10  G-CO12  G-MD3  G-MG2  G-SRT8  SEP1-8  CC1-7  PS3.D  LS1A-C, 2A-C, 3A-B  ETS1-2 |
| Clinical Practices  Medical Terminology  Lab Skills  Pharmacology  Radiology  Medical Records  Administration of Medications  Common Surgical Practices | N/A | N/A | N/A | N/A |

**CAREER PREPARATION STANDARDS:**

1. **PERSONAL SKILLS -** Students will understand how personal skill development affects their employability. This skill includes positive attitudes, self-confidence, honesty, responsibility, initiative, self-discipline, personal hygiene, time management, and the capacity for lifelong learning.
2. Demonstrate an understanding of classroom policies and procedures.
3. Discuss importance of the following personal skills in the business environment:
4. positive attitude
5. self-confidence
6. honesty
7. perseverance
8. self-management/work ethic
9. pride in product/work
10. dependability
11. Identify acceptable work attire.
12. Establish goals for self-improvement and further education/training.
13. Prioritize tasks and meet deadlines.
14. Understand the importance of initiative and leadership.
15. Understand the importance of lifelong learning in a world of constantly changing technology.
16. **INTERPERSONAL SKILLS** - Students will understand key concepts on group dynamics, conflict resolution, and negotiation. This skill includes the ability to work cooperatively, accept supervision, assume leadership roles, and show respect for others. This standard includes an understanding of sexual harassment laws and an appreciation of cultural diversity in the workplace.
17. Identify and discuss behaviors of an effective team.
18. Explain the central importance of mutual respect in the workplace relations.
19. Discuss and demonstrate strategies for conflict resolution and negotiation, and explain their importance within the business environment.
20. Understand laws that apply to sexual harassment in the workplace, and identify tactics for handling harassment situations.
21. Work cooperatively, share responsibilities, accept supervision and assume leadership roles.
22. Demonstrate cooperative working relationships and proper etiquette across gender and cultural groups.
23. **THINKING AND PROBLEM-SOLVING SKILLS** - Students will exhibit critical and creative thinking skills, logical reasoning, and problem-solving. These skills include applying basic skills in order to calculate, estimate, measure; identify, locate, and organize information/data; interpret and follow directions from manuals, labels, and other sources; analyze and evaluate information and solutions.
24. Recognize the importance of good academic skills and implement a plan for self-improvement as needed.
25. Read, write, and give directions.
26. Exhibit critical and creative thinking skills and logical reasoning skills, and employ these skills for problem solving.
27. Work as a team member in solving problems.
28. Diagnose the problem, its urgency, and its causes.
29. Identify alternatives and their consequences.
30. Explore possible solutions.
31. Compare/contrast the advantages and disadvantages of alternatives.
32. Determine appropriate action(s).
33. Implement action(s).
34. Evaluate results of action(s) taken.
35. **COMMUNICATION SKILLS** - Students will understand principles of effective communication. This standard includes effective oral and written communication, listening skills, following and giving directions, requesting and giving information, asking questions.
36. Use communication concepts in application of skills, techniques, and operations.
37. Prepare written material.
38. Analyze written material.
39. Understand and implement written instructions, from technical manuals, written communications, and reference books.
40. Present a positive image through verbal and nonverbal communication, and understand the power of body language in communication.
41. Demonstrate active listening through oral and written feedback.
42. Give and receive feedback.
43. Demonstrate assertive communications (both oral and written).
44. Demonstrate proper etiquette in workplace communications, including an awareness of requisites for international communications (languages, customs, time zones, currency and exchange rates).
45. Demonstrate writing/editing skills as follows:
46. Write, proofread, and edit work.
47. Use correct grammar, punctuation, capitalization, vocabulary, and spelling.
48. Select and use appropriate forms of technology for communication.
49. Exhibit a proficiency in the use of reference books.
50. Research, compose, and orally present information for a variety of business situations utilizing appropriate technology.
51. **OCCUPATIONAL SAFETY** - Students will understand occupational safety issues, including the avoidance of physical hazards in the work environment. This includes the safe operation of equipment, proper handling of hazardous materials, appropriate attire and safety accessories, avoidance of physical injuries, interpretation of warning and hazard signs and terminology, and following and understanding safety-related directions.
52. Discuss and implement good safety practices, including the following (if applicable to course):
53. personal
54. lab
55. fire
56. electrical
57. equipment
58. tools
59. interpretation of Material Safety Data Sheets (MSDSs)
60. Environmental Protection Agency (EPA)
61. Occupational Safety and Health Administration (OSHA)
62. American Red Cross Standards (ARC)
63. Networking Safety Standards
64. Apply sound ergonomic principles in organizing one’s work space.
65. **EMPLOYMENT LITERACY** - Students will understand career paths and strategies for obtaining employment within their chosen field. This includes traditional job preparation skills, such as resumes, application forms, cover letters, sources of employment information, and interviewing skills, but also includes an overview of the industry and an understanding of labor market trends.
66. Explore career opportunities and projected trends; investigate required education, training and experience; and develop an individual education plan.
67. Identify steps for setting goals and writing personal goals and objectives.
68. Examine aptitudes related to career options; relate personal characteristics and interests to educational and occupational opportunities.
69. Develop a career portfolio, including the following documents:
70. job application
71. resume(s)
72. appropriate cover and follow-up correspondence
73. Identify and demonstrate effective interviewing techniques.
74. **TECHNOLOGY LITERACY** - Students will understand and adapt to changing technology by identifying, learning, and applying new skills to improve job performance. Students should understand the role of technology in their chosen field and should be able to use all appropriate technology. Students should also feel confident in their ability to learn new technology by generalizing from what they know, adapting skills to new situations, and identifying and using sources of information and of further learning.
75. Demonstrate the ability to use personal computers for loading and retrieving data, information gathering, measurements, and writing.
76. Identify the characteristics and explain the importance of adapting to changes, being flexible, and evaluating goals when working in the industry.
77. Understand the importance of lifelong learning in adapting to changing technology.
78. **IMPORTANCE OF ETHICS** – Students will understand proper ethics in the workplace.
79. Discuss social and ethical responsibilities in the industry.
80. Demonstrate ethical choices in workplace situations.