LCB File No. R010-03

PROPOSED REGULATION OF THE STATE BOARD OF EDUCATION/ STATE BOARD FOR OCCUPATIONAL EDUCATION

(This proposed regulation was previously adopted as LCB File Nos. T014-03 and T033-03)

Explanation: Matter in ***italics*** is new; matter in brackets ~~[ ]~~ is material to be omitted.

AUTHORITY: NRS 385.080

Section 1. NAC 389 is hereby amended as follows:

AGRICULTURE MECHANICAL ENGINEERING TECHNOLOGY.

Section 2. ~~[NAC 389.538 Agricultural machinery and construction. A course of study in agricultural machinery and construction must include instruction designed to teach the pupil to do the following:~~

~~1. Demonstrate the proper use of agricultural machinery and equipment and perform the necessary maintenance.~~

~~2. Develop an understanding of agricultural machinery and how it functions.~~

~~3. Apply knowledge and skill in the construction used on a modern farm including welding, oxyacetylene cutting, plumbing and electrical wiring.~~

~~4. Estimate the materials needed for constructing a given project for a farm and calculate its cost.]~~

Agriculture Mechanical Engineering Technology. A course of study in agriculture and natural resource sciences must be designed so that pupils meet the following performance standards by completion of the terminal course of instruction:

1. For the area of Safety, demonstrate and practice general shop safety and those practices specific to the learning activity:

(a) Understand personal/group safety while working in an agriculture mechanics environment.

2. For the area of Welding, understand the principals and application of welding and cutting and be able to explain the role of heat and the fusion process:

(a) Practice safety, demonstrate equipment setup and maintenance, appropriate welding and cutting procedures and practices proper tool selection and use of Oxy/fuel welding (OFW).

(b) Practice safety, demonstrate proper equipment setup and maintenance, appropriate welding procedures, and practice proper tool selection while using shielded metal arc welding (SMAW).

(c) Practice safety, demonstrate proper equipment setup and maintenance, appropriate welding procedures, and practice proper tool selection while using gas metal and arc welding (GWAW, FCAW).

(d) Practice safety, demonstrate proper equipment setup and maintenance, appropriate welding procedures, and practice proper tool selection while using gas tungsten are welding (GWAW).

(e) Practice safety, demonstrate proper equipment setup and maintenance, appropriate welding procedures, and practice proper tool selection while using Air Arc (CAC-A) and Plasma cutting (PAC) procedures.

3. For the area of Electrical, understand the principles of generation, distribution, and application of electricity in agricultural and industrial settings:

(a) Show knowledge of safety practices and use safe practices and procedures during learning activities appropriate to agriculture electrification.

(b) Recognize principles and theories of electricity.

(c) Describe appropriate use and application of electrical conductors and over-current protection.

(d) Recognize standard components of electrical systems.

(e) Understand, design and construct electrical circuits.

(f) Demonstrate proficiency in the use of electrical meters & test equipments.

4. For the area of Agriculture Industrial Water Management, understand principles and applications of water and waste water management as they relate to agricultural and industrial settings:

(a) Demonstrate safe practices and procedures associated with agricultural and industrial water management.

(b) Understand the theory and design of various water transfer system.

(c) Understand the application of various components relating to water transfer systems.

5. For the area of Concrete, understand the principles and applications of concrete as applied to agricultural and industrial construction:

(a) Demonstrate safe practices and procedures associated with the use of concrete in agricultural and industrial construction.

(b) Know the components and ratios of various concrete mixtures.

(c) Demonstrate knowledge of proper concrete applications and construction.

6. For the area of Fencing, understand the agricultural and industrial applications of fencing:

(a) demonstrate safe practices and procedures associated with the construction of agricultural and industrial fences.

(b) Describe the application of the various types of fencing systems.

(c) Understand the design and installation of various fencing system.

7. For the area of Agriculture Industrial Drafting, demonstrate proficiency in agricultural and industrial drafting:

(a) Understand the use of various types of plans.

(b) Prepare and use plans appropriate to the learning activity.

8. For the area Agricultural Industrial Buildings, show an understanding of applications of agricultural and industrial buildings:

(a) Know and demonstrate safe practices and procedures associated with the construction of agricultural and industrial buildings.

(b) Demonstrate an understanding of different types of structures used in the agriculture industry.

(c) Be able to select and design the appropriate building for the specific agricultural application.

(d) Demonstrate the necessary skills for maintenance and repair of agriculture structures.

(e) Learn to construct a selected agricultural structure.

9. For the area of Small Engine Power & Equipment, understand principles and applications of small engine power in an agricultural setting:

(a) Know and demonstrate safe practices and procedures associated with the operation, maintenance and repair of small engines and equipment.

(b) Demonstrate a working knowledge of the essential engines operating systems.

(c) Recognize appropriate power attachments and their applications.

(d) Demonstrate through performance, a working knowledge of maintenance and repair procedures on small gas engines and their power attachments.

10. For the area of Hand and Power Tools, identify and demonstrate the proper use of hand and power tools as they are used in the agricultural industry:

(a) Identify general shop hand and power tools.

(b) Show a working knowledge of and demonstrate safe use of hand and power tools.

(c) Able to select and use the proper tool for the application.

(d) Demonstrate appropriate procedures for the maintenance and repair of hand and power tools.

11. For the area of Gas and Diesel Power, understand the basic principles, operations and maintenance of gas and diesel engines as used in agricultural settings:

(a) Show knowledge of safety practices and procedures appropriate to gas and diesel engines as used in agricultural settings.

(b) Will use safe practices and procedures during learning activities and procedures appropriate to gas and diesel power.

(c) Demonstrate knowledge of the theoretical operation of a multiple cylinder engine.

(d) Demonstrate a working knowledge of the maintenance and repair of multiple cylinder engines.

12. For the area of Hydraulics, understand the basic principles, operations and maintenance of hydraulic systems as they are applied in the agricultural industry:

(a) Knowledge of and use safe practices and procedures appropriate to hydraulic systems in the agricultural industry.

(b) Demonstrate a knowledge of the basic principles of hydraulics.

(c) Able to identify the components of hydraulic systems.

(d) Demonstrate appropriate maintenance and repair of a hydraulic system.

(e) Design and build a hydraulic systems to be incorporated into an agricultural applications.

13. For the area of Agricultural Industrial Machinery, understand and demonstrate basic skills in operation, maintenance and repair of agricultural industrial machinery:

(a) Know and demonstrate safe practices and procedures associated with the operation, maintenance and repair of agricultural industrial machinery and equipment.

(b) Demonstrate knowledge of the theoretical operation of agricultural machinery.

(c) Demonstrate a working knowledge of the maintenance of agricultural machinery.

(d) Demonstrate a working knowledge of the repair of agricultural machinery.

(e) Demonstrate skills in the safe operation of agricultural tractors and machinery.

14. For the area of Electrical Power, understand and demonstrate the operation, maintenance and use of electrical power in agricultural applications:

(a) Know and demonstrate safe practices and procedures associated with the operation, maintenance and repair of electrical power.

(b) Describe the basic principles and operation of electric motors and controls.

(c) Able to design and build an electric system using motors and controls.

(d) Demonstrate appropriate maintenance and repair of electrical motor and control systems.

15. For the area of Supervised Agriculture Experience, explain the relationship between a supervised agriculture experience and their preparation for a career in Agricultural Mechanical Engineering Technology:

(a) actively engage in and manage SAE, which enables them to develop work-based skills.

16. For the area of Leadership/FFA, recognize the importance of leadership skills including interpersonal relations, group management, and communications through involved participation in the FFA:

(a) Recognize the traits of effective leaders and participate in leadership training through involved participation in the FFA.

17. For the area of Employability Standard, achieve competence in workplace readiness, career development, and lifelong learning.

(a) Demonstrate problem-solving skills.

(b) Demonstrate critical thinking skills.

(c) Demonstrate the ability to speak, write, and listen effectively.

(d) Demonstrate the ability to select, apply, and maintain appropriate technology.

(e) Demonstrate leadership and teamwork skills.

(f) Demonstrate sound workplace ethics.

(g) Demonstrate the ability to effectively manage resources in high-performance workplaces.

(h) Demonstrate career planning and development skills.

(i) Demonstrate job-retention and lifelong-learning skills.

COUNSELING PROGRAM STANDARDS K-12, CAREERS, ACADEMIC, PERSONAL/SOCIAL DEVELOPMENT

Section 3. ~~**[NAC 389.392 Career and occupational guidance.**~~ ~~A course of study in career and occupational guidance must include instruction designed to teach the pupil by the completion of the eighth grade to:~~

~~1. Demonstrate a positive attitude toward himself as a unique and worthy person.~~

~~2. Define the factors which influence the development of a positive self-esteem.~~

~~3. Demonstrate skills in recognizing acceptable similarities and differences among people.~~

~~4. Demonstrate skills for interacting with others.~~

~~5. Demonstrate skills in self-discipline, reducing stress and coping with changes in life.~~

~~6. Demonstrate good health maintenance.~~

~~7. Describe the considerations involved in making choices regarding leisure and life style.~~

~~8. Demonstrate the application of skills in the academic and occupational disciplines—communication, mathematics, economics, science and technology.~~

~~9. Demonstrate a knowledge of skills that facilitate learning.~~

~~10. Demonstrate the adaptation of skills in a dynamic society.~~

~~11. Demonstrate decision making when applied to career, educational and occupational planning.~~

~~12. Demonstrate a knowledge of the relationship between a changing world and lifelong learning.~~

~~13. Describe how choices in leisure time fulfill personal needs.~~

~~14. Describe how each job contributes to society.~~

~~15. Describe how occupations and careers relate to personal needs and society's functions.~~

~~16. Demonstrate skills for locating, evaluating and interpreting information about careers and occupations.~~

~~17. Demonstrate skills for making career and occupational decisions.~~

~~18. Demonstrate employability skills.~~

~~19. Describe the services available for placing a person in an area of employment that relate to the person's own interests and skills.~~**]**

[NAC 389.512 Career and occupational guidance. ~~A course of study in career and occupational guidance must include instruction designed to teach the pupil to:~~

~~1. Demonstrate a positive attitude toward himself as a unique and worthy person.~~

~~2. Define the factors which influence the development of a positive self-esteem.~~

~~3. Demonstrate skills in recognizing acceptable similarities and differences among people.~~

~~4. Demonstrate skills for interacting with others.~~

~~5. Demonstrate skills in self-discipline, reducing stress and coping with changes in life.~~

~~6. Demonstrate good health maintenance.~~

~~7. Demonstrate personal skills, attitudes and competencies necessary for becoming a contributing, responsible citizen.~~

~~8. Describe the considerations involved in making choices regarding leisure and life style.~~

~~9. Demonstrate the application of skills in the academic and occupational disciplines—communication, mathematics, economics, science and technology.~~

~~10. Demonstrate a knowledge of skills that facilitate learning.~~

~~11. Demonstrate the adaptation of skills in a dynamic society.~~

~~12. Demonstrate decision making when applied to career, educational and occupational planning.~~

~~13. Demonstrate a knowledge of the relationship between a changing world and lifelong learning.~~

~~14. Describe how choices in leisure time fulfill personal needs.~~

~~15. Describe how each job contributes to society.~~

~~16. Demonstrate an awareness of the dignity in all work.~~

~~17. Describe how occupations and careers relate to personal needs and society's functions.~~

~~18. Demonstrate skills for locating, evaluating and interpreting information about career and occupational education.~~

~~19. Demonstrate skills for making career and occupational decisions.~~

~~20. Demonstrate employability skills.~~

~~21. Use the services available for placing a person in an area of employment that relate to the person's own interests and skills.~~**]**

School Counseling Program Standards Grades K-12 Career, Academic, Personal/Social Development. A course of study in career, academic, and personal/social development must include instruction designed to teach pupils from kindergarten through completion of the twelfth grade:

1. For the area of academic achievement and life-long learning, demonstrate skills that support academic achievement and life-long learning:

(a) demonstrate attitudes, knowledge and skills that contribute to effective learning in school and across the life span

(b)complete school academically prepared to choose from a wide range of post-secondary options

(c) explain the relationship of education to work, life, and community

2. For the area of career exploration, investigate career options and develop the necessary skills and attitudes to make successful transition from school to work:

(a) explain career goals

(b) explain the relationship between personal characteristics, education, training, and work

(c) develop strategies to achieve future career goals

3. For the area of personal/social development, acquire skills that maximize their personal and social development:

(a) acquire the attitudes, knowledge and interpersonal skills to understand and respect self and others

(b) make decisions, set goals and take appropriate action to achieve goals

(c) apply life skills that contribute to safe and healthy development

4, For the area of employability skills, achieve competence in workplace readiness, career development, and lifelong learning:

(a) demonstrate problem-solving skills

(b) demonstrate critical thinking skills

(c) demonstrate the ability to speak, write and listen effectively

(d) demonstrate the ability to select, apply and maintain appropriate technology

(e) demonstrate leadership and teamwork skills

(f) demonstrate sound work ethics

(g) demonstrate the ability to effectively manage resources

(h) demonstrate career planning and development skills

(i) demonstrate job- retention and lifelong learning skills

EARLY CHILDHOOD EDUCATION AND SERVICES

Section 4. ~~[NAC 389.578 Care of children. A course of study in the care of children must include instruction designed to teach the pupil to do the following:~~

~~1. Identify different types of centers for the care of children.~~

~~2. Demonstrate a knowledge of first aid.~~

~~3. Identify the patterns of behavior found in each stage in the development of a child from birth to 5 years of age.~~

~~4. Lead educational activities for children.~~

~~5. Guide a child's behavior using reinforcement of the proper behavior.~~

~~6. Identify procedures for opening and operating a facility for the care of children.~~

~~7. Identify state or national standards and requirements for licensing for operating or working in a facility for the care of children.]~~

Early Childhood Education and Services. A course of study in family and consumer sciences must be designed so that pupils meet the following performance standards by the completion of the terminal courses of instruction:

1. For the area of careers in Early Care and Education, analyze career paths within early childhood development, education and services:

(a) Determine the roles and functions of individuals engaged in early childhood education and services.

(b) Explore opportunities for employment and entrepreneurial endeavors

(c) Examine education and training requirements and opportunities for career paths in early childhood education and services

(d) Examine the impact of early childhood education and services occupations on local, state, national and global economics.

2. For the area of Developmentally Appropriate Practices, analyze developmentally appropriate practices to plan for early childhood development, education and services:

(a) Examine child development theories and their implications for early childhood education practices.

(b) Utilize a variety of methods to observe and interpret children's growth and development.

(c) Consider cultural and environmental influences within children's development.

(d) Determine special needs of children.

(e) Practice effective strategies that promote the growth and development of all children.

3. For the area of Curriculum and Instruction, demonstrate integration of curriculum and instruction to meet children's developmental needs and interest:

(a) Examine a variety of curriculum and instructional models.

(b) Implement learning activities in all curriculum areas that meet the developmental needs of all children.

(c) Implement and integrate a pre-literacy curriculum for children.

(d) Implement and integrated curriculum that considers a child's language, learning styles, home experiences, and cultural values.

(e) Arrange learning centers that provide for children's exploration, discovery, and development.

(f) Establishes activities, routines and transitions.

4. For the area of Health and Safety, demonstrate a safe and healthy learning environment for children:

(a) Manage physical space to maintain a safe and healthy learning environment.

(b) Apply safe and healthy practices that comply with appropriate licensing agency regulations.

(c) Implement strategies to teach children health, safety, and sanitation habits.

(d) Provide safe and healthy meals and snacks.

(e) Document symptoms of child abuse and neglect and use appropriate procedures to report suspected abuse or neglect to the designated authorities.

(f) Implement basic health practices and prevention procedures for workers and children regarding childhood illness and communicable diseases.

(g) Demonstrate security and emergency procedures.

5. For the area of Child and Family Relationships, demonstrate techniques for positive collaborative relationships with children and their families:

(a) Establish developmentally appropriate guidelines for behavior.

(b) Demonstrate problem-solving skills with children.

(c) Demonstrate interpersonal skills and implement strategies that promote positive and productive relationships with children.

(d) Implement strategies for constructive and supportive interactions between children and families.

(e) Present information in a positive and supportive manner to parents regarding their children's developmental issues and concerns.

6. For the area of Employability Skills, achieve competence in workplace readiness, career development, and lifelong learning:

(a) Demonstrate problem-solving skills.

(b) Demonstrate critical-thinking skills.

(c) Demonstrate the ability to speak, write, and listen effectively.

(d) Demonstrate the ability to select, apply, and maintain appropriate technology.

(e) Demonstrate leadership and teamwork skills.

(f) Demonstrate sound workplace ethics.

(g) Demonstrate the ability to effectively manage resources in high performance workplaces.

(h) Demonstrate career planning and development skills.

(i) Demonstrate job-retention and lifelong-learning skills.

PLANT AND ENVIRONMENTAL HORTICULTURE SCIENCE

Section 5. ~~[NAC 389.522 Ornamental horticulture. A course of study in ornamental horticulture must include instruction designed to teach the pupil to do the following:~~

~~1. Identify structures and equipment used in providing ornamental plants and plants from a greenhouse or nursery.~~

~~2. Develop a knowledge of horticultural marketing, finances, credit, accounts, labeling, pricing, displays and advertising.~~

~~3. Identify and demonstrate the skill to control diseases, insects, organisms and weeds.~~

~~4. Perform different types of propagation of plants.~~

~~5. Apply a knowledge of accessories used in floral design and arranging and of the judging of flowers.]~~

~~[NAC 389.654 Introduction to plant science. A course of study in an introduction to plant science must include instruction designed to teach the pupil to:~~

~~1. Identify the characteristics which distinguish gymnosperms from angiosperms.~~

~~2. Identify the parts of a seed on a variety of specimens.~~

~~3. Identify the characteristics which distinguish a fruit from a seed.~~

~~4. Identify the parts of an embryo plant.~~

~~5. Describe the functions of the various types of root systems.~~

~~6. Describe the functions of the four types of root tissues.~~

~~7. Identify the functions of woody and nonwoody plant stems.~~

~~8. Identify the inner and outer structures of woody plants.~~

~~9. Identify the characteristics which distinguish heartwood from sapwood.~~

~~10. Identify the various parts of a leaf.~~

~~11. Describe the main functions of leaves.~~

~~12. Describe the process of photosynthesis.~~

~~13. Explain how food substances and water are carried throughout a leaf.~~

~~14. Compare the venation of dicot and monocot leaves.~~

~~15. Describe the distinguishing characteristics of evergreen and deciduous plants and provide examples of each.~~

~~16. Explain why fall coloration takes place in certain types of plants.~~

~~17. Define the term "flower."~~

~~18. Describe the function of each part of a monocot and dicot flower.~~

~~19. Identify plants which have both stamens and pistils on the same flower.~~

~~20. Identify plants which have stamens and pistils in separate flowers on the same plant.~~

~~21. Identify plants that have separate male and female plants.~~

~~22. Define asexual reproduction.~~

~~23. Identify the common forms of asexual reproduction in plants.~~

~~24. Provide examples of fruits and vegetables that are reproduced by each of the asexual methods.~~

~~25. Define "sexual reproduction" in plants.~~

~~26. Describe the process of seed formation.~~

~~27. Describe environmental factors affecting plant growth.~~

~~28. Describe the soil characteristics that relate to plant growth.~~

~~29. Conduct a pH test of a soil sample and interpret the results.~~

~~30. Define plant disease.~~

~~31. Identify a variety of plant diseases.~~

~~32. Define insect pests.~~

~~33. Identify a variety of insect pests.~~

~~34. Describe the common types of pesticides to include the benefits and hazards of each.~~

~~35. Identify examples of plant products that are used for medicinal purposes or as stimulants.~~

~~36. List examples of tree species used in the production of lumber categorized as either softwood or hardwood.~~

~~37. Identify plants used for their aesthetic value.~~

~~38. Identify the knowledge and skills needed to obtain a job in the area of plant science.~~**]**

Plant and Environmental Horticulture Science. A course of study in agriculture and natural resource sciences must be designed so that pupils meet the following performance standards by the completion of the terminal courses of instruction:

1. For the area of Plant Science, explain the plant anatomy, physiology, and reproduction as they relate to environmental horticulture:

(a) Describe the major external plant structures and their functions.

(b) Describe the major internal plant structures and their functions.

(c) Recognize differences in the methods of plant reproduction.

(d) Describe processes involved in plant growth.

2. For the area of Plant Classification, recognize the importance of plant classification and identification and classify and identify local horticulture plant materials.

(a) Recognize the importance of the history and purpose of plant classification and nomenclature

(b) Recognize plant characteristics used for identification.

3. For the area of Soil and Water Science, recognize the importance of the interaction of soil, water, and fertilizer in plant production:

(a) Explain the relationship between soils and plant production

(b) Understand plant nutrition practices for plants as it relates to plant growth and health.

(c) Understand effective management practices used in irrigation, drainage, watersheds, and water conservation.

4. For the area of Pest Control, explore basic principles of integrated pest management and identify pest and disease damage and learn methods of control:

(a) Describe and explain safe pesticide management practices.

(b) Identify insects and insect damage and learn methods of pest management as it relates to agriculture and horticulture crops.

(c) Identify weeds and describe methods of weed control as it relates to agricultural and horticultural crops.

(d) Identify diseases, disease damage, and describe methods of control.

5. For the area of Arboriculture, explain basic principles of arboriculture as it relates to management of ornamental and production trees and shrubs:

(a) Explain proper planting and transplanting techniques for ornamental and production trees and shrubs.

(b) Describe management practices used with ornamental and production trees and shrubs.

(c) Explain and identify tools and equipment involved in the management of ornamental and production trees and shrubs.

6. For the area of Greenhouse, understand greenhouse design, construction, management, and operation in the production of a greenhouse crop:

(a) Explain principles of greenhouse and growing structure design, construction, and operation.

(b)Explain the principles of management and production of greenhouse crops.

7. For the area of Nursery, explore the care and maintenance of nursery stock and understand the importance of wholesale and retail nursery operations.

(a) Explain principles involved in the production of nursery stock.

(b) Describe management practices involved in a retail nursery operation.

8. For the area of Turf Grass, understand the selection, installation, and maintenance of turf:

(a) Describe the considerations involved in turf grass selection.

(b) Describe the various methods of turf grass installation.

(c) Identify and explain the cultural practices involved in the maintenance and care of turf grass.

9. For the area of Landscape, understand the basic principles of landscape planning, design, construction, irrigation, and maintenance:

(a) Describe the principles and practices involved in landscape planning and design.

(b) Describe proper techniques used in landscape construction.

(c) Examine the practices involved in the design, construction, and maintenance of irrigation systems.

(d) Explain proper landscape maintenance practices.

10. For the area of Floral Design, understand the basic principles and skills involved in the design and construction of floral arrangements:

(a) Demonstrate the basic design principles used in the floral industry.

(b) Identify and use flowers and foliage utilized in the floral industry.

(c) Identify and use floral tools and materials.

11. For the area of Business Management, understand the importance of business principles and practices in the horticulture industry:

(a) Explain the basic business principles.

(b) Explain the importance of keeping business and production records.

12. For the area of Supervised Agriculture Experience, explain the relationship between a supervised agriculture experience and their preparation for a career in horticulture:

(a) Actively engage in and manage an SAE, which enables students to develop work-based skills

13. For the area of Leadership and FFA, recognize the importance of leadership skills including interpersonal relations, group management, and communications:

(a) Recognize the traits of effective leaders and participate in leadership training through involved participation in the FFA.

14. For the area of Employability Standard, achieve competence in workplace readiness, career development, and lifelong learning.

(a) Demonstrate problem-solving skills.

(b) Demonstrate critical thinking skills.

(c) Demonstrate the ability to speak, write, listen effectively.

(d) Demonstrate the ability to select, apply, and maintain appropriate technology.

(e) Demonstrate leadership and teamwork skills.

(f) Demonstrate sound workplace ethics.

(g) Demonstrate the ability to effectively manage resources in high-performance workplaces.

(h) Demonstrate career planning and development skills.

(i) Demonstrate job-retention and lifelong-learning skills.

Section 1. NAC 389 is hereby amended as follows:

Section 2. ***Information Technology Program Standards Grades 9-12. A course of study in information technology must be designed so that pupils meet the following performance standards:***

1. For the area of Network Systems, students will demonstrate an understanding of basic network systems to include administration, security, file and disk management, topology and internetworking design, implementation and network instrumentation:

(a) demonstrate the fundamental tasks required to administer a network; and

(b) demonstrate the use of network security policies and procedures; and

(c) demonstrate proper file and disk management skills; and

(d) construct, differentiate and diagnose network systems.

2. For the area of Information Technology Service and Support, students will demonstrate an understanding of basic hardware and software support, quality customer service skills, documentation skills, basic electronics and troubleshooting skills, utilizing electronic test equipment and hand tools:

(a) demonstrate an understanding of hardware and software support; and

(b) demonstrate an understanding of quality customer service skills; and

(c) demonstrate proficiency with documentation skills; and

(d) demonstrate an understanding of basic electronics, troubleshooting skills and the proper use of repair tools.

3. For the area of Multimedia, students will demonstrate an understanding of multimedia content creation and authoring. This will encompass fundamental drawing techniques, audio, video, animation, typography, digital imaging and an understanding of web design and development, e-commerce, intellectual property and copyright law:

(a) demonstrate an understanding of fundamental drawing techniques; and

(b) demonstrate an understanding of audio; and

(c) demonstrate an understanding of video; and

(d) demonstrate an understanding of computer animation; and

(e) demonstrate an understanding of typography; and

(f) demonstrate an understanding of computer digital imaging; and

(g) demonstrate an understanding of web design and development; and

(h) demonstrate an understanding of the fundamentals of e-commerce; and

(i) demonstrate an understanding of intellectual property and copyright law.

4. For the area of Computer Programming, students will demonstrate an understanding of essential programming skills including the design and analysis, coding, testing and integration of software:

(a) demonstrate an understanding of essential programming skills; and

(b) demonstrate an understanding of the design and analysis of software; and

(c) demonstrate an understanding of software coding; and

(d) demonstrate an understanding of software testing and integration.

5. For the area of Computer Applications, students will demonstrate an understanding of contemporary application programs, including: spreadsheets, databases, word processing, desktop publishing and presentation software, to include installation, setup and upgrades:

(a) demonstrate an understanding of office software application products; and

(b) demonstrate an understanding of software installation, setup and upgrades.

6. For the area of Information Technology Management, students will demonstrate an understanding of the management of information technology areas within an organization, workplace interpersonal communication skills, proficiency in oral, written and presentation communication skills, enforcement and compliance of company policies and procedures. This content standard requires the student to have a pre-established technical information technology background:

(a) demonstrate an understanding of the management of information technology organizational issues; and

(b) demonstrate proficiency in communication skills; and

(c) demonstrate an understanding of the enforcement and compliance of company information technology policies and procedures.

7. For the area of Telecommunications, students will demonstrate an understanding of telecommunications technology, including telephony, public switch telephone network (PSTN) and its operation and specifications, broadband and baseband LAN/MAN/WAN technologies, wireless technologies and emerging communications technologies:

(a) demonstrate an understanding of telephony and PSTN, including its operation and specifications; and

(b) demonstrate an understanding of broadband and baseband LAN/MAN/WAN systems; and

(c) demonstrate an understanding of wireless technologies.

8. For the area of Employability Skills, students shall achieve competence in workplace readiness, career development, and lifelong learning:

(a) demonstrate problem-solving skills; and

(b) demonstrate critical- thinking skills; and

(c) demonstrate the ability to speak, write and listen effectively; and

(d) demonstrate the ability to select, apply and maintain appropriate technology; and

(e) demonstrate leadership and teamwork skills; and

(f) demonstrate sound work ethics; and

(g) demonstrate the ability to effectively manage resources; and

(h) demonstrate career planning and development skills; and

(i) demonstrate job retention and lifelong learning.

Section 3. *Computer-Aided Drafting and Design. A course of study in computer-aided drafting and design must be designed so that pupils meet the following performance standards by the completion of an advanced program of instruction:*

1. For the area of fundamental drafting skills, the student shall demonstrate skill in geometric constructions, measurement and scaling, conventional drafting practices, multi-view drawings, dimensions and annotations, pictorial drawings, and development of drawings and models.

(a) Create various geometric constructions;

(b) Demonstrate appropriate measuring and scaling techniques;

(c) Demonstrate conventional drafting practices;

(d) Create multi-view drawings using orthographic projections;

(e) Apply dimensions and annotations;

(f) Create pictorial drawings;

(g) Create development drawings and models.

2. For the area of fundamental computer skills, understand computer-aided drafting and design processes as demonstrated by the student's ability to:

(a) Determine fundamental safety and ergonomic factors in the CADD work environment;

(b) Maintain, operate and adjust computer hardware;

(c) Demonstrate proficiency in common operating systems and software.

3. For the area of fundamental computer-aided drafting and design skills, understand computer-aided drafting and design processes as demonstrated by the student's ability to:

(a) Perform drawing setup and layout;

(b) Create, apply and modify annotations;

(c) Construct and manipulate problems using the Cartesian Coordinate System;

(d) Create and modify geometric entities utilizing command sequences;

(e) Utilize media output.

4. For the area of advanced computer-aided drafting and design skills, understand computer-aided drafting and design processes as demonstrated by the student's ability to:

(a) Develop symbols, attributes, and libraries;

(b) Apply appropriate geometric dimensioning and tolerancing standards;

(c) Output drawings;

(d) Develop and display three-dimensional models;

(e) Develop and construct presentation drawings;

(f) Customize and computer-aided drafting and design working environment.

5. For the area of related disciplines, understand computer-aided drafting and design principles as demonstrated by the student's ability to:

(a) Apply drafting concepts related to basic manufacturing processes;

(b) Apply drafting concepts related to basic architectural design;

(c) Apply drafting concepts related to basic geographic information systems and civil engineering;

(d) Apply drafting concepts related to basic electronics.

6. For the area of employability skills, achieve workplace readiness, career development, and lifelong learning as demonstrated by the student's ability to:

(a) Demonstrate problem-solving skills;

(b) Demonstrate critical-thinking skills;

(c) Demonstrate the ability to speak, write, and listen effectively;

(d) Demonstrate the ability to select, apply, and maintain appropriate technology;

(e) Demonstrate leadership and teamwork skills;

(f) Demonstrate sound workplace ethics;

(g) Demonstrate the ability to effectively manage resources in high-performance workplaces;

(h) Demonstrate career planning and development skills;

(i) Demonstrate job retention and lifelong-learning skills.