

**PROPOSED REGULATION OF THE
STATE BOARD OF EDUCATION**

LCB File No. R040-05

June 29, 2005

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

AUTHORITY: §§1, 2 and 3, NRS 385.080 and 385.110.

A REGULATION relating to courses of study; prescribing standards for metalworking and welding; and providing other matters properly relating thereto.

Section 1. Chapter 389 of NAC is hereby amended by adding thereto a new section to read as follows:

A course of study in metalworking 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 safety, demonstrate safe work practices while performing operations in the metalworking laboratory, as demonstrated by the pupil's ability to:

(a) Comply with personal and environmental safety practices associated with:

(1) Clothing;

(2) Protection of the eyes and ears;

(3) Hand tools and power equipment;

(4) Proper ventilation; and

(5) The handling, storage and disposal of materials in accordance with local, state and federal safety and environmental regulations.

(b) Adhere to the general rules of laboratory safety as they apply to:

- (1) Flammables;*
- (2) Ventilation;*
- (3) Electrical hazards;*
- (4) Maintenance of orderly work areas;*
- (5) Personal protective wear;*
- (6) Safe use of tools and equipment;*
- (7) Work habits and behaviors; and*
- (8) Lifting and emergency response.*

(c) Adhere to the specific procedures of fire safety in the laboratory and the rules applying

to:

- (1) The proper use of extinguishers;*
- (2) Evacuation;*
- (3) Knowledge of potential fire hazards;*
- (4) Ventilation;*
- (5) Personal protective wear; and*
- (6) Storage of flammables.*

2. For the area of measurement and layout techniques, understand the proper use of layout and measurement tools and techniques, as demonstrated by the pupil's ability to:

- (a) Use measuring tools to complete required laboratory assignments;*
- (b) Use and apply layout tools to complete required laboratory projects;*
- (c) Interpret basic prints and develop working drawings; and*
- (d) Apply basic mathematical skills common to the metalworking industry.*

3. For the area of metallurgy, understand the classification and physical properties of different types of metals common to the welding industry, as demonstrated by the pupil's ability to:

(a) Identify the types and shapes of metals;

(b) Describe and apply the principles of metallurgy as they apply to hardening and annealing; and

(c) Describe the effects of heating and cooling of metals to be fabricated.

4. For the area of tools and machines, understand how to safely operate commonly used machines and tools, as demonstrated by the pupil's ability to identify and safely operate:

(a) Stationary power machines commonly used in the welding industry;

(b) Portable power machines commonly used in the welding industry; and

(c) Hand tools commonly used in the welding industry.

5. For the area of welding techniques, understand proper welding and cutting techniques, as demonstrated by the pupil's ability to:

(a) Properly use personal protective equipment and procedures;

(b) Set up and operate oxy-fuel welding and cutting equipment;

(c) Set up and operate shielded metal arc welding equipment;

(d) Set up and operate gas metal arc welding equipment;

(e) Set up and operate gas tungsten arc welding equipment; and

(f) Set up and operate plasma arc welding equipment.

6. For the area of sheet metal, understand the proper layout, forming and fastening techniques, as demonstrated by the pupil's ability to:

(a) Demonstrate pattern development and layout techniques;

- (b) Identify and demonstrate the use of sheet metal forming machines and hand tools; and*
- (c) Identify and demonstrate the use of various sheet metal fastening techniques.*

7. For the area of machine tools, understand the identification and safe operation of machine tools, as demonstrated by the pupil's ability to set up and safely operate:

- (a) Metal cutting lathes;*
- (b) Milling machines; and*
- (c) The drill press.*

8. For the area of skills necessary to obtain employment, achieve competence in workplace readiness, career development and lifelong learning by demonstrating:

- (a) Skills necessary for solving problems;*
- (b) Skills of critical thinking;*
- (c) The ability to speak, write and listen effectively;*
- (d) The ability to select, apply and maintain appropriate technology necessary for a career;*
- (e) Skills of leadership and teamwork;*
- (f) An awareness of the ethical behavior appropriate for the workplace;*
- (g) An ability to manage effectively resources in the workplace;*
- (h) Skills necessary for the planning and development of a career; and*
- (i) Skills necessary for retention of a job and continuation of learning throughout a career.*

Sec. 2. NAC 389.516 is hereby amended to read as follows:

389.516 A local school board may offer the following courses of study as elective courses in a public high school:

1. History, other than American history.
2. Government, other than American government.

3. Agriculture and natural resource sciences, which may include the courses of study described in NAC 389.520 to 389.536, inclusive.
4. The arts.
5. Business, which may include the courses of study described in NAC 389.543 to 389.555, inclusive.
6. Communications, which may include the courses of study described in NAC 389.556 and 389.558.
7. Occupational education, in cooperation with private employers, as described in NAC 389.562, 389.564 and 389.566.
8. Drivers' education.
9. Foreign language.
10. Occupations, which may include the courses of study described in NAC 389.572 to 389.584, inclusive.
11. Occupations in trade and industry, which may include the courses of study described in NAC 389.586 to 389.618, inclusive ~~§~~, *and section 1 of this regulation.*
12. Family and consumer sciences.
13. Industrial arts.
14. Marketing.
15. Skills needed to obtain employment as described in NAC 389.644 to 389.650, inclusive.
16. Social studies.
17. Introduction to occupations which may include the courses of study described in NAC 389.6528 to 389.6547, inclusive.
18. Great Basin Native American languages.

Sec. 3. NAC 389.612 is hereby amended to read as follows:

389.612 A course of study in welding must ~~[include instruction designed to teach the pupil to do]~~ *be designed so that pupils meet* the following ~~[-~~:

- ~~—1. Cut metal with machine and manual torches.~~
- ~~—2. Butt weld and fillet weld in any position using:~~
 - ~~—(a) Brass and silver;~~
 - ~~—(b) A metallic arc;~~
 - ~~—(c) Arc welding with tungsten gas; and~~
 - ~~—(d) Metallic inert gas.]~~ *performance standards by the completion of an advanced program of instruction:*

1. For the area of safety, demonstrate safe work practices while performing operations in the welding laboratory, as demonstrated by the pupil's ability to:

(a) Comply with personal and environmental safety practices associated with:

- (1) Clothing;*
- (2) Protection of the eyes and ears;*
- (3) Hand tools and power equipment;*
- (4) Proper ventilation; and*
- (5) The handling, storage and disposal of materials in accordance with local, state and federal safety and environmental regulations.*

(b) Adhere to the general rules of laboratory safety as they apply to:

- (1) Flammables;*
- (2) Ventilation;*
- (3) Electrical hazards;*

- (4) Maintenance of orderly work areas;*
- (5) Personal protective wear;*
- (6) Safe use of tools and equipment;*
- (7) Work habits and behaviors; and*
- (8) Lifting and emergency response.*

(c) Adhere to the specific procedures of fire safety in the laboratory and the rules applying

to:

- (1) The proper use of extinguishers;*
- (2) Evacuation;*
- (3) Knowledge of potential fire hazards;*
- (4) Ventilation;*
- (5) Personal protective wear; and*
- (6) Storage of flammables.*

2. For the area of measurement and layout techniques, understand the proper use of layout and measurement tools and techniques, as demonstrated by the pupil's ability to:

- (a) Use measuring tools to complete required laboratory assignments;*
- (b) Use and apply layout tools to complete required laboratory projects;*
- (c) Interpret basic prints and develop working drawings; and*
- (d) Apply basic mathematical skills common to the welding industry.*

3. For the area of metallurgy, understand the classification and physical properties of different types of metals common to the welding industry, as demonstrated by the pupil's ability to:

- (a) Identify the types and shapes of metals; and*

(b) Describe the effects of heating, cooling and annealing processes of metals to be fabricated.

4. For the area of tools and machines, understand how to safely operate commonly used machines and tools, as demonstrated by the pupil's ability to identify and safely operate:

(a) Stationary power machines commonly used in the welding industry;

(b) Portable power machines commonly used in the welding industry; and

(c) Hand tools commonly used in the welding industry.

5. For the area of oxy-fuel welding and cutting, understand proper welding and cutting techniques, as demonstrated by the pupil's ability to:

(a) Properly use personal protective equipment and procedures;

(b) Identify, select, set up and use oxy-fuel welding equipment;

(c) Identify, select, set up and use oxy-fuel cutting equipment; and

(d) Identify, select, set up and use oxy-fuel brazing equipment.

6. For the area of shielded metal arc welding, understand proper shielded metal arc welding techniques, as demonstrated by the pupil's ability to:

(a) Use safety procedures and describe the electrical theory of shielded metal arc welding;

(b) Select and set up the appropriate equipment and consumables used in shielded metal arc welding; and

(c) Perform shielded metal arc welding using appropriate safety techniques.

7. For the area of gas metal arc welding, understand proper gas metal arc welding techniques, as demonstrated by the pupil's ability to:

(a) Use safety procedures and describe the electrical theory of gas metal arc welding;

(b) Select and set up the appropriate equipment and consumables used in gas metal arc welding; and

(c) Perform gas metal arc welding using appropriate safety techniques.

8. For the area of flux cored arc welding, understand proper flux cored arc welding techniques, as demonstrated by the pupil's ability to:

(a) Use safety procedures and describe the electrical theory of flux cored arc welding;

(b) Select and set up the appropriate equipment and consumables used in flux cored arc welding; and

(c) Perform flux cored arc welding using appropriate safety techniques.

9. For the area of gas tungsten arc welding, understand proper gas tungsten arc welding techniques, as demonstrated by the pupil's ability to:

(a) Use safety procedures and describe the electrical theory of gas tungsten arc welding;

(b) Select and set up appropriate equipment and consumables used in gas tungsten arc welding; and

(c) Perform gas tungsten arc welding using appropriate safety techniques.

10. For the area of plasma arc cutting, understand proper plasma arc cutting techniques, as demonstrated by the pupil's ability to:

(a) Use safety procedures and describe the electrical theory of plasma arc cutting;

(b) Select and set up the appropriate equipment and consumables used in plasma arc cutting; and

(c) Perform plasma arc cutting using appropriate safety techniques.

11. For the area of fabrication, understand the tools, equipment and fabrication techniques, as demonstrated by the pupil's ability to:

(a) Identify and use fabrication techniques and equipment while planning, designing, laying out and constructing projects;

(b) Identify and perform nondestructive weld-testing techniques; and

(c) Identify and perform destructive weld-testing techniques.

12. For the area of skills necessary to obtain employment, achieve competence in workplace readiness, career development and lifelong learning by demonstrating:

(a) Skills necessary for solving problems;

(b) Skills of critical thinking;

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

(d) The ability to select, apply and maintain appropriate technology necessary for a career;

(e) Skills of leadership and teamwork;

(f) An awareness of the ethical behavior appropriate for the workplace;

(g) An ability to manage effectively resources in the workplace;

(h) Skills necessary for the planning and development of a career; and

(i) Skills necessary for retention of a job and continuation of learning throughout a career.