**130.17. Forestry and Woodland Ecosystems (One-Half to One Credit).**

(a)  General requirements. This course is recommended for students in Grades 10-12.

(b)  Introduction. To be prepared for careers in natural resource systems, students need to attain academic skills and knowledge, acquire technical knowledge and skills related to natural resources, and develop knowledge and skills regarding career opportunities, entry requirements, and industry expectations. To prepare for success, students need opportunities to learn, reinforce, apply, and transfer knowledge and skills in a variety of settings. This course examines current management practices for forestry and woodlands. Special emphasis is given to management as it relates to ecological requirements and how these practices impact the environment.

(c)  Knowledge and skills.

(1)  The student learns the employability characteristics of a successful employee. The student is expected to:

(A)  identify career development and entrepreneurship opportunities in the field of forestry and woodland ecosystems;

(B)  apply competencies related to resources, information, interpersonal skills, and systems of operation in forestry and woodland ecosystems;

(C)  demonstrate knowledge of personal and occupational safety practices in the workplace; and

(D)  identify employers' expectations, including appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills.

(2)  The student describes the principles of forestry and woodland ecosystems. The student is expected to:

(A)  describe the historical and economic significance of forestry;

(B)  illustrate tree anatomy and growth;

(C)  identify species of trees;

(D)  identify forest and woodland soils;

(E)  describe silviculture;

(F)  define ecosystems;

(G)  describe photosynthesis and respiration;

(H)  describe watershed management;

(I)  define succession; and

(J)  compare forests and woodlands.

(3)  The student demonstrates forestry biometrics skills. The student is expected to:

(A)  calculate tree volume;

(B)  estimate timber growth and yield;

(C)  evaluate by cruising timber stands; and

(D)  calculate quality and volume by scaling logs.

(4)  The student performs forestry management skills. The student is expected to:

(A)  identify forestry management options;

(B)  define multiple-use possibilities; and

(C)  demonstrate the control of destructive agents such as fire, insects, and disease.

(5)  The student identifies softwood and hardwood forest management and utilization practices. The student is expected to:

(A)  identify principles of forestry economics;

(B)  research sources of forestry management assistance;

(C)  identify harvesting practices and equipment;

(D)  describe merchandising practices; and

(E)  identify research in forestry and wood technology.

(6)  The student describes the role of wood technology in forest product development. The student is expected to:

(A)  compare timber manufacturing processes and products; and

(B)  identify research and development issues in forestry and wood technology.

(7)  The student applies cartographic skills to natural resource activities. The student is expected to:

(A)  describe different types of maps;

(B)  interpret map features and legends;

(C)  interpret map scale and actual distance;

(D)  identify direction from map;

(E)  distinguish elevation and terrain features from topographic maps;

(F)  use directional tools with maps to locate position;

(G)  use land survey and coordinate systems;

(H)  use a Geographic Information System to interface geospatial data; and

(I)  interpret photos and images.

(8)  The student identifies and distinguishes ethical practices in the field of natural resource systems. The student is expected to:

(A)  identify and evaluate ethical guidelines;

(B)  evaluate how advances in science and technology have raised concerns about ethical issues; and

(C)  identify a national organization or institution that seeks to promote ethical behavior and analyze its success and impact.

(9)  The student develops an improved supervised agriculture experience program as it relates to agriculture, food, and natural resources. The student is expected to:

(A)  plan, propose, conduct, and evaluate entrepreneurship; placement; exploratory; research, either experimental or analytical; improvement; supplementary; laboratory-based; or other identified, supervised agricultural experience as an experiential learning activity;

(B)  apply proper record-keeping skills as they relate to a supervised experience;

(C)  design and use a customized record-keeping system for the individual supervised experience;

(D)  participate in youth leadership opportunities to create a well-rounded experience program in agriculture; and

(E)  produce a challenging approach for a local program of activities in agriculture.