COMMON COURSE OUTLINE: Course discipline/number/title: HORT 2331: Greenhouse Operations and Management

A. CATALOG DESCRIPTION
   1. Credits: 3
   2. Hours/Week: 3
   3. Prerequisites (Course discipline/number): ENGL 0980 and MATH 0093
   4. Co-requisites (Course discipline/number): None
   5. MnTC Goals (if any): NA

Greenhouses structures are a means by which flowering and foliage plants can be forced to grow on a more accelerated and uniform schedule. Greenhouses have evolved from single-standing glass framed structures to multiple-sectioned mechanized greenhouse ranges. Many greenhouses today have automated systems for lighting, watering, transport, and environmental control. This course will present information applicable to greenhouses ranging in size from small single units to large automated complexes. Topics include greenhouse structures, glazing materials, bench systems, irrigation systems, and environmental control.

B. DATE LAST REVISED (Month, year): January, 1997

C. OUTLINE OF MAJOR CONTENT AREAS:  
This course will focus on the main categories of decisions with which you will be faces as you design, build, and operate a greenhouse business.

D. LEARNING OUTCOMES (GENERAL): The student will be able to:
   1. Contrast greenhouse forms-types.
   2. Contrast greenhouse structural materials.
   3. Examine greenhouse-propagation structures.
   5. Contrast rigid greenhouse covering materials.
   6. Outline greenhouse structure maintenance requirements.
   7. Examine greenhouse cooling systems.
   8. Examine greenhouse heating systems.
   9. Examine greenhouse ventilation systems.
  10. Examine greenhouse carbon dioxide enrichment systems.
  11. Calculate greenhouse heating requirements.
  12. Calculate greenhouse cooling-ventilation requirements.
  13. Describe greenhouse energy conservation methods.
  14. Describe light intensity concepts
  15. Describe light duration concepts.
  17. Describe high intensity lighting systems.
  18. Examine high intensity lighting systems.
  19. Describe low intensity lighting systems.
  20. Examine low intensity lighting systems.
  21. Describe greenhouse photoperiod control systems.
  22. Examine greenhouse photoperiod control systems.
  23. Examine raised greenhouse bench systems.
  24. Examine ground greenhouse bench systems.
  25. Outline raised bench construction methods.
  26. Outline ground bench construction methods.
  27. Describe manual watering systems-methods.
  28. Examine automatic overhead watering systems.
  29. Examine automatic sub-irrigation systems.
  30. Examine capillary-ebb and flow irrigation systems.
  31. Examine automatic mist-fog systems.
  32. Describe friction loss-flow velocity concepts.
  33. Calculate friction loss-flow velocity.
D. LEARNING OUTCOMES (GENERAL): Continued. . . The student will be able to:
34. Describe water pressure relationships.
35. Examine irrigation-mist-fog system components.
36. Examine solvent weld-pipe threading techniques.
37. Install irrigation pipe.
38. Connect irrigation pipe-valves-strainer.
39. Install irrigation emitters-mist nozzle.
40. Examine irrigation time clocks-control systems.
41. Describe basic electrical principles.
42. Describe basic electrical circuits.
43. Describe basic electrical switch principles.
44. Describe electrical motor principles.
45. Describe time clock-controller installation procedures.
46. Install time clocks-controllers.
47. Connect irrigation line-water systems.
48. Describe water pumps-well systems.
49. Demonstrate electrical safety practices.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
1. Tests
2. Quizzes
3. Lab work
4. Class participation
5. Other miscellaneous assignments

G. SPECIAL INFORMATION (if any):
Tuition Differential