WTCS Repository

10-804-133  Mathematics and Logic

Course Outcome Summary

Course Information

Description  Students will apply problem solving techniques from discrete mathematics. Topics include symbolic logic, sets, algebra and base number systems.

Total Credits  3.00

Pre/Corequisites

Prerequisite  Each Wisconsin Technical College determines the General Education course prerequisites used by their academic institution. If prerequisites for a course are determined to be appropriate, the final Course Outcome Summary must identify the prerequisites approved for use by the individual Technical College.

Recommended Prerequisite Skills: Working knowledge of algebra (Pre-Algebra or Elementary Algebra)

Course Competencies

1. Solve applied algebraic problems

   Assessment Strategies
   1.1. Oral, Written or Graphic Assessment

   Criteria
   1.1. you simplify algebraic expressions
   1.2. you solve algebraic equations
   1.3. you represent or interpret the applied problems algebraically
   1.4. you illustrate the solutions mathematically using charts, graphs, diagrams etc.

2. Utilize heuristic tools for problem solving

   Assessment Strategies
   2.1. Oral, Written or Graphic Assessment

   Criteria
   2.1. you differentiate among heuristic tools (examples may include draw a diagram, make a list, eliminate possibilities, look for sub-problems, work backwards, etc.)
   2.2. you identify the root of the problem
   2.3. you justify choice of heuristics when solving problems
   2.4. you apply the heuristics to the problem
   2.5. you solve the problem
   2.6. you document the process you used to solve the problem

3. Convert between place value number systems

   Assessment Strategies
   3.1. Oral, Written or Graphic Assessment
Criteria
3.1. you convert from base N to decimal
3.2. you convert from decimal to base N
3.3. you convert between computer number systems (binary, octal and hexadecimal)

4. **Apply number systems to problem solving**
   Assessment Strategies
   4.1. Oral, Written or Graphic Assessment
   Criteria
   4.1. you differentiate among different number systems
   4.2. you analyze the root of the problem
   4.3. you justify the choice of the number system for solving the problem
   4.4. you apply the number system to solving the problem
   4.5. you solve the problem
   4.6. you document the process you used to solve the problem

5. **Apply principles of set theory**
   Assessment Strategies
   5.1. Oral, Written or Graphic Assessment
   Criteria
   5.1. you use set theory notation
   5.2. you use appropriate set terminology
   5.3. you apply set properties to solve problems
   5.4. you apply the concept of cardinality
   5.5. you draw a Venn diagram
   5.6. you use Venn diagram to solve problems
   5.7. you document the process you use to solve the problem

6. **Apply symbolic logic principles**
   Assessment Strategies
   6.1. Oral, Written or Graphic Assessment
   Criteria
   6.1. you differentiate among logical operators (i.e. and, or, x-or, and not)
   6.2. you differentiate between conditional and biconditional using various logical methods (i.e. truth table, matrix logic, Boolean algebra, etc.)
   6.3. you apply logic methods to solve problems
   6.4. you verify the solution to the problem