

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: MATH 124 Department: Mathematics

Course Title: Math for a Technical Society Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Understand the concepts of graph theory.	<ol style="list-style-type: none">1. Find an Euler circuit if possible.2. Identify valences.3. Eulerize a graph.4. Find a Hamiltonian circuit .5. Use nearest neighbor and sorted edges algorithm.6. Use Kruskals algorithm to find minimum cost spanning tree.
2. Understand the concepts of bin-packing.	<ol style="list-style-type: none">1. Use next fit algorithm.2. Use worst fit algorithm.3. Use first fit algorithm.4. Use a decreasing list with the next fit, worst fit and first fit algorithm.5. Find a critical path of a digraph.
3. Understand the concepts of linear programming.	<ol style="list-style-type: none">1. Find the resource constraint inequalities.2. Find the profit equation.3. Draw the feasible region.

Course Objective	Competencies
4. Understand the concepts of gathering data.	<ol style="list-style-type: none"> 4. Find the corner points. 5. Find the point which gives maximum profit.
4. Understand the concepts of summarizing data.	<ol style="list-style-type: none"> 1. Use a random number table to get a random sample. 2. Recognize possible confounding elements in an experiment. 3. Identify biases in a sampling method. 4. Use simple random sampling, a control group and unbiased population to obtain statistically meaningful data.
5. Understand the concepts of elementary probability.	<ol style="list-style-type: none"> 1. Find the mean of a sample. 2. Find the median of a sample. 3. Find the first and third quartiles. 4. Draw a histogram. 5. Do a scatterplot. 6. Use a regression line to predict values.
6. Understand the methods of statistical inference.	<ol style="list-style-type: none"> 1. Find a sample space. 2. Use the fundamental principle of counting. 3. Find the probability of an independent event. 4. Use a normal distribution curve and the 68-95-99.7 rule.
7. Understand the methods of voting.	<ol style="list-style-type: none"> 1. Distinguish between statistic and parameter. 2. Find standard deviation of a sample. 3. Find the standard deviation of a statistic. 4. Give a 95% confidence interval.

Course Objective	Competencies
<p>8. Understand weighted voting systems.</p>	<ol style="list-style-type: none"> 1. Determine the winner of an election using the Condor 6+ method. 2. Harc system. 3. Plurality method. 4. Sequential-pair wise voting. 5. The Borda count. 6. State Arrow's impossibility theorem. <ol style="list-style-type: none"> 1. Use notation to give a system with the quota and weights. 2. Write the winning and minimal winning coalitions. 3. Determine the Banzhaf power index. 4. Identify dummy and dictator voters.