

Final Exam Topics:

All Topics:

- Definitions and Concepts

Exam I material:

- Graph: Is it connected? a tree? a digraph?
- Find an Euler circuit or explain why one doesn't exist (Euler's Theorem)
- Eulerize a given graph
- Find a Hamiltonian circuit using (a) nearest-neighbor method, (b) sorted-edges method
- Find a minimum-cost Hamiltonian circuit (brute-force method)
- Use Fundamental Principle of Counting
- Find a minimum-cost spanning tree using Kruskal's algorithm
- Using the list-processing algorithm and a given priority list, schedule tasks on 2 or 3 processors
- Given an order-requirement digraph, find the critical-path priority list, and use it to schedule tasks on 2 or 3 processors
- Schedule independent tasks on a given number of processors
- Pack bins using a method from class (FF, NF, WF, FFD, NFD, WFD)
- Pack bins using a method given to you

Exam II material:

- Calculate interest earned, total amount in account, or starting principal in account under (a) simple interest, (b) compound interest, (c) continuous compounding
- Given a nominal interest rate, calculate APY under (a) simple interest, (b) compound interest, (c) continuous compounding
- Use Savings Formula to determine how much will be in a retirement account after some given period of time.
- Use CPI to convert prices from one year to another
- Find the depreciated value of some item
- Find monthly payment, interest and total paid for (a) add-on loan, (b) discounted loan
- Find monthly payment for a conventional loan
- Find equity on a home

Exam III material:

- Use significant figures
- Apply basic growth model for populations
- Apply logistic growth model for populations
- Calculate static reserve and exponential reserve, and understand what they mean
- Be able to write about concepts for economics for harvesting renewable resources (sustainability, profit, etc.)
- Given a reproduction curve, draw a cobweb diagram
- Be able to give and describe an example of mathematical chaos
- Find a check digit (or check that it is correct) using (a) UPC method, (b) ISBN method, (c) a method given to you

New material:

- Know details about ZIP codes, ZIP+4, and Postnet codes (10-digit and 12-digit versions)
- Translate a given Postnet code into numbers, and fix the result if one bar in the code is the wrong length
- Use Soundex system to encode a given last name
- Use a given rule to figure out other parts of a driver's license number
- Use given parity-check sum rules to determine check digits for a message and convert it into a codeword
- Find the distance between two binary strings
- Given a table of codewords, use the nearest-neighbor method to decode a received message
- Find the weight of a binary code
- Use the weight of a binary code to determine (a) how many errors it can detect, (b) how many errors it can correct
- Given frequency data, build a Huffman tree and determine the code values of the letters involved
- Given a Huffman tree, encode a given message
- Given a Huffman tree, decode a given encoded message