

# WENHAN GAO

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## COMPUTING, PROGRAMMING, DISCRETE MATH, AND INFO-MANAGEMENT

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### **AMS 595, Fundamentals of Computing**

Grade: A, 4.0/4.0

- Graduate Course taken as an undergrad student. Topics including: scripting, data structures, algorithms, scientific computing, performance optimization, software engineering, version control(git), program development tools.
- Projects in Python, Matlab, and C++.

### **MAT 331, Computer-Assisted Math Problem Solving**

Grade: A, 4.0/4.0

- **Projects written in Python:** Cryptograph(Caesar, Vigenere, RSA), Apollonian packing(Fractal), Coloring Julia/Mandelbrot Set and Newton's Method. The course also covers Monte-Carlo Methods, Numerical ODE, Numerical Differentiation and Integration, Tower of Hanoi(Recursion).

### **EST 320, Communication Tech Systems**

Grade: A, 4.0/4.0

- Textbook: **Principles of Computer Networks and Communication**, D. Barry, S. Morris

### **ET-704, Networking Fundamentals I**

Grade: A, 4.0/4.0

- Textbook: **Network+ Guide to Networks**

### **EST 305, Applications Software for Information Management**

Grade: A, 4.0/4.0

- Textbook: **VBA for Modelers: Developing Decision Support Systems with Microsoft Excel**, 4th edition, S. Christian Albright; Duxbury
- Textbook: **Management Science: The Art of Modeling with Spreadsheets**, 4th ed, Powell and Baker
- **Project written in Visual Basic:** Projecting the Effectiveness of Covid Vaccines with User Interfaces

### **ET-570, Creating Smartphone Applications**

Grade: A, 4.0/4.0

- **Created a web-based mobile game with JavaScript**(unfortunately, does not work on iOS).

### **MA-471 Introduction to Discrete Structures**

Grade: A, 4.0/4.0

- Textbook: **Discrete Mathematics and Its Applications**, 6th Ed., by Kenneth Rosen

### **MAT 312, Applied Algebra**

Grade: A, 4.0/4.0

- Textbook: **Numbers, Groups and Codes**, 2nd Ed., by Humphreys and Prest

### **AMS 303, Graph Theory**

Grade: A, 4.0/4.0

- Textbook: **Introduction to Graph Theory**, 5th Ed., by R. Wilson
- Textbook: **Applied Combinatorics**, Sixth Edition, by A.Tucker, John Wiley & Sons.
- **Final Project on Cryptography**, wrote a Python program to assist in visualizing frequency patterns.

### **AMS 301, Finite Mathematical Structures**

Grade: A, 4.0/4.0

- Textbook: **Applied Combinatorics**, Sixth Edition, by A.Tucker, John Wiley & Sons.

## PROGRAMMING CERTIFICATES/ONLINE COURSES

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## Machine Learning

Coursera

- Linear Regression, Logistic Regression, Regularization, Neural Networks, Machine Learning System Design, Support Vector Machines, Unsupervised Learning(K-means clustering), Dimensionality Reduction(Principal Component Analysis), Anomaly Detection, Recommender Systems, Online Learning

## Deep Learning Specialization

Coursera

- Five Courses in the Deep Learning Specialization. Learn to build neural network architectures such as Convolutional Neural Networks, Recurrent Neural Networks, etc.. and to make NNs better with strategies such as Dropout, BatchNorm, and Xavier/He initialization. Implemented some industry applications using Python and TensorFlow.

## Getting Started with AWS Machine Learning

Coursera

- Key problems that Machine Learning can address and ultimately help solve.

## Python Specialization

Coursera

- Five Courses in the Python Specialization offered by University of Michigan. Fundamental programming concepts including data structures, networked application program interfaces, and databases.

## Mastering Programming with MATLAB

Coursera

- Advanced concepts related to functions such as recursion and function handles.
- Learn basics of Object Oriented Programming and how to write efficient programs.
- Learn to write Live Scripts and create GUIs.

## Bayesian Statistics: From Concept to Data Analysis

Coursera

- This course introduces the Bayesian approach to statistics, starting with the concept of probability and moving to the analysis of data.
- Key differences between Bayesian and Frequentist approaches

## PROOF-BASED MATH COURSES

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### MAT 310, Linear Algebra

Grade: A, 4.0/4.0

- Textbook: **Linear Algebra Done Right**, 3rd Ed., by Sheldon Axler

### MAT 342, Applied Complex Analysis

Grade: A, 4.0/4.0

- Textbook: **Complex Variables and Applications**, 9th Ed.; Brown and Churchill

### MAT 320, Introduction to Analysis

Grade: A, 4.0/4.0

- Textbook: **Introduction to Real Analysis**, 4th Ed., by Bartle and Sherbert

### MAT 312, Applied Algebra

Grade: A, 4.0/4.0

- Textbook: **Numbers, Groups and Codes**, 2nd Ed., by Humphreys and Prest

### MAT 360, Geometric Structures

Grade: A, 4.0/4.0

- Textbook: **Euclidean and Non-Euclidean Geometries Development and History**, 4th Ed., by Marvin J. Greenberg

### MAT 200, Logic, Language and Proof

Grade: A, 4.0/4.0

- Textbook: **An Introduction to Mathematical Reasoning: Numbers, Sets and Functions**, 1st Ed., by Eccles, Peter J.

**MA-471 Introduction to Discrete Structures**

Grade: A, 4.0/4.0

- Textbook: **Discrete Mathematics and Its Applications**, 6th Ed., by Kenneth Rosen

**MATH COURSES THAT INVOLVES LESS PROOFS**

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**AMS 311, Probability Theory**

Grade: A, 4.0/4.0

- Textbook: **A First Course in Probability**, 10th Ed., by Sheldon Ross

**AMS 333, Mathematical Biology**

Grade: A, 4.0/4.0

- Textbook(recommended): **Essential Mathematical Biology**, by Nicholas Britton, Third, Ed.
- **Projects with Matlab Simulation:** Analysis of Bacteria Growth, LV Model, Influenza Epidemics

**MAT 341, Applied Real Analysis**

Grade: A, 4.0/4.0

- Textbook: **Boundary Value Problems and Partial Differential Equations**, 6th Ed., by D. Powers

**AMS 303, Graph Theory**

Grade: A, 4.0/4.0

- Textbook: **Introduction to Graph Theory**, 5th Ed., by R. Wilson
- Textbook: **Applied Combinatorics**, Sixth Edition, by A.Tucker, John Wiley & Sons.
- **Final Project on Cryptography**, wrote a Python program to assist in visualizing frequency patterns.

**AMS 301, Finite Mathematical Structures**

Grade: A, 4.0/4.0

- Textbook: **Applied Combinatorics**, Sixth Edition, by A.Tucker, John Wiley & Sons.

**AMS 315, Data analysis**

Grade: A, 4.0/4.0

- Textbook: **An Introduction to Statistical Methods and Data Analysis**, by Ott and Longnecker, 7th Edition
- **Final Project** written in R(programming).

**AMS 361, Applied Calculus IV: Differential Equations**

Grade: A, 4.0/4.0

- Textbook: **Lectures, Problems and Solutions for Ordinary Differential Equations**, by Yuefan Deng, Second Edition

**AMS 310, Survey of Probability and Statistics**

Grade: A, 4.0/4.0

- Textbook: **Probability and Statistics for Engineering and Science with Examples in R**, Second Edition, by Hongshik Ahn

**AMS 210, Applied Linear Algebra**

Grade: A, 4.0/4.0

- Textbook: **Introduction to Linear Algebra: Models, Methods and Theory**, by Alan Tucker

**MAT 203, Calculus III with Applications**

Grade: A, 4.0/4.0

- Textbook: **Multivariable Calculus**, 8th Edition, by James Stewart