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Course Work

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Computer Science Courses

CSc 583 - Text Retrieval & Web Search, *Spring 2025*

A
3.0 Units

- Instructor: Eduardo Blanco.
- Final Grade: 96.5%. Grades available here.
- Syllabus: Available here.
- Graduate Level Course.
- Programming Language: Python (PyTorch, spaCy).
- Summary of Topics: This course covers the fundamental knowledge necessary to build IR systems, such as web crawling, index construction and compression, Boolean, vector-based, and probabilistic retrieval models, text classification and clustering, link analysis algorithms such as PageRank, and computational advertising.

CSc 460 - Database Design, *Spring 2025*

A
3.0 Units

- Instructor: Lester McCann.
- Ranked: *2nd* among 60 students. Ranking's list available here, identifier: 312138.
- Final Grade: 95.73%. Grades available here.
- Syllabus: Available here.
- Programming Language: Java, SQL (JDBC, PostgreSQL, Oracle).
- Textbook: Database Systems (Connolly/Begg), U.S. 6th ed., Addison-Wesley, 2015.
- Summary of Topics: Functions of a database system. Data modeling and logical database design. Query languages and query optimization. Efficient data storage and access. Database access through standalone and web applications.

CSc 380 - Principles of Data Science, *Spring 2025*

A
3.0 Units

- Instructor: Chicheng Zhang.
- Final Grade: 96.33%. Grades available here.
- Syllabus: Available here.
- Programming Language: Python (NumPy, Pandas, Matplotlib, Scikit-learn).
- Textbook: Database Systems (Connolly/Begg), U.S. 6th ed., Addison-Wesley, 2015.
- Summary of Topics: basic probability, basic statistics and data wrangling, and basic data analysis using programming libraries.

A **CSc 585** - **Algorithms for NLP**, *Fall 2024*

3.0 Units
- Instructor: Eduardo Blanco.
- Final Grade: 101.91% with extra credits. Grades available here.
- Syllabus: Available here.
- Graduate Level Course.
- Programming Language: Python (PyTorch, TensorFlow, spaCy, NLTK).
- Summary of Topics: This course covers important algorithms for natural language processing (NLP), including traditional NLP algorithms, distributional similarity algorithms such as word embeddings, sequence labeling models, neural networks such as recurrent, recursive and convolutional neural networks, transformers, and parsing algorithms such as shift-reduce. The course will focus on the algorithms that underlie NLP rather than the application of NLP to various problem domains. We will cover syntax, semantics, and pragmatics. Topics will include both classical and cutting- edge algorithms.

A **CSc 352** - **Systems Programming and UNIX**, *Fall 2024*

3.0 Units
- Instructor: Eric Anson.
- Final Grade: 94.41%. Grades available here.
- Syllabus: Available here.
- Programming Language: C.
- Summary of Topics: Programming in C, including arrays, lists, stacks, queues, trees, pointers, and dynamic memory allocation. Unix topics, including debuggers, makefiles, shell programming, and other topics that support C programming.

A **CSc 345** - **Analysis of Discrete Structures**, *Fall 2024*

3.0 Units
- Instructor: Lester McCann.
- Final Grade: 94.90%. Grades available here (identifier: 637988).
- Syllabus: Available here.
- Programming Language: Java.
- Textbook: Data Structures and Algorithm Analysis, by Clifford Shaffer, 2013.
- Summary of Topics: Introduction to and analysis of algorithms and characteristics of discrete structures. Course topics include algorithm analysis techniques, recurrence relations, structural induction, hierarchical structures, graphs, hashing, and sorting.

P **CSc 493** - **Internship**, *Summer 2024*

1.0 Units
- Credit Earned: Internship at Stanford University as an visiting research intern.

S **CSc 492** - **Directed Research**, *Spring 2024*

3.0 Units
- Credit Earned: Undergraduate research assistant for Dr. Steven Bethard.

S **CSc 391** - **Preceptorship**, *Spring 2024*

3.0 Units
- Credit Earned: Undergraduate teaching assistant for Dr. Lester McCann in CSc 144.
- Course Description: Available here.

A **CSc 335** - **Object-Oriented Programming and Design**, *Spring 2024*

3.0 Units
- Instructor: Rick Mercer.
- Final Grade: 98.95%. Grades available here.
- Programming Language: Java.
- Summary of Topics: Fundamentals of object-oriented software development. Includes design principles, inheritance, polymorphism, Unified Modeling Language (UML), testing, event-driven programming with graphical user interfaces, applications of design patterns, and use of existing frameworks.

A **CSc 252** - **Computer Organization**, *Spring 2024*

3.0 Units
- Instructor: Russell Lewis.
- Final Grade: 96.48%. Grades available here.
- Programming Language: C, Java, MIPS Assembly.
- Summary of Topics: Basic machine organization; elementary hardware concepts; interrupts. Machine operations and instructions; assembly language concepts and programming.

A **CSc 337** - **Web Programming**, *Fall 2023*

3.0 Units
- Instructor: Benjamin Dicken.
- Final Grade: 97.77%. Grades available here.
- Syllabus: Available here.
- Programming Language: JavaScript.
- Final Project: A specialized room reservation system for the Computer Science Department at the University of Arizona, to be used starting Spring 2025.
- Summary of Topics: HTML, CSS, JavaScript, DOM, Event-Driven Programming, NodeJS, AJAX and Promises, Express, MongoDB, Mongoose, JSON, Web Security, Sessions, Cookies, MERN, and React.

A **CSc 244** - **Discrete Math for Computer Science II**, *Fall 2023*

3.0 Units
- Instructor: Reyan Ahmed.
- Final Grade: 104.49% with extra credits. Grades available here.
- Syllabus: Available here.
- Textbook: Discrete Mathematics and Its Applications, 8th Edition by Kenneth Rosen.
- Summary of Topics: The Pigeonhole Principle, Proofs, Recurrence Relations, Induction & Recursion, Graphs & Graph Models, Representing Graphs & Graph Isomorphism, Connectivity, Euler & Hamilton Paths, Trees, Languages & Grammars, Finite-State Machines with Output, Finite-State Machines with No Output, Language Recognition, and Turing Machines.

A **CSc 210** - **Software Development**, *Fall 2023*

4.0 Units
- Instructor: Rick Mercer.
- Final Grade: 98.05%. Grades available here.
- Syllabus: Available here.
- Programming Language: Java.
- Textbook: Computing Fundamentals with Java and JUnit, Rick Mercer, Paaz Publishing.
- Summary of Topics: Java Fundamentals, Objects and Classes, String Objects, Java Methods/Parameters, Arrays, File I/O, For Loops, While Loops, Exception Handling, Generics with <Type> Arguments, Java.util.HashMap, Binary Trees, Binary Search Trees (BSTs), Recursion, Git, and GitHub.

S **CSc 391** - **Preceptorship**, *Fall 2022*

3.0 Units
- Credit Earned: Undergraduate teaching assistant for Dr. Lester McCann in CSc 144 - Discrete Math for Computer Science I.
- Course Description: Available here.

A **CSc 144** - **Discrete Math for Computer Science I**, *Spring 2023*

3.0 Units
- Instructor: Lester McCann.
- Ranked: *Fourth* among 250 students. Ranking's list available here, identifier: 974718.
- Final Grade: 96.99%. Grades available here.
- Syllabus: Available here.
- Programming Language: Prolog.
- Textbook: Discrete Mathematics and Its Applications, 8th Edition by Kenneth Rosen.
- Summary of Topics: Logic, Quantifiers, Arguments, Direct Proofs, Set Concepts, Relations, Functions, Indirect Proofs, Integers, Sequences and Strings, Methods of Counting, and Finite Probability.

A **CSc 120** - **Introduction to Computer Programming II**, *Spring 2023*

4.0 Units
○ Instructor: Janalee O'Bagy.
○ Final Grade: 95.37%. Grades available here.
○ Syllabus: Available here.
○ Programming Language: Python.
○ Summary of Topics: Basics of Object-Oriented Programming, References, Linked Lists, Stacks and Queues, Recursion, Trees, Testing, Complexity, Hashing, Debugging, Exceptions, List Comprehensions, and Recursive Search.

A **CSc 110** - **Introduction to Computer Programming I**, *Fall 2022*

4.0 Units
○ Instructor: Adriana Picoral.
○ Grades: Available here.
○ Syllabus: Available here.
○ Programming Language: Python.
○ Summary of Topics: Python Basics, Strings, Numeric and Variables, Controlling Data Output, If-Elif-Else Statements, Repetition, While-Loops, Loop Table, Functions, Basic Graphical Shapes, Graphical Motion, Lists, For-Loops, Reading and Writing Files, Sets, Dictionaries, Multi-dimensional Data Structures, Tuples, PPM Images, Searching, and Sorting.

Mathematics

A **MATH 323** - **Formal Mathematical Reasoning and Writing**, *Spring 2024*

3.0 Units
○ Instructor: Moysey Brio
○ Final Grade: Grades available here.
○ Syllabus and Policy: Available here.
○ Textbook: Richard Hammack, "Book of Proof", 2018.
○ Summary of Topics: Elementary real analysis as an introduction to abstract mathematics and the use of mathematical language. Elementary logic and quantifiers; manipulations with sets, relations and functions, including images and pre-images; properties of the real numbers; supreme and infimum; other topics selected from cardinality, the topology of the real line, sequence and limits of sequences and functions; the emphasis throughout is on proving theorems.

A **MATH 223** - **Vector Calculus**, *Spring 2024*

4.0 Units
○ Instructor: Donna M Krawczyk
○ Final Grade: Grades available here.
○ Syllabus and Policy: The common course webpage is here.
○ Textbook: Multivariable Calculus; 6th edition; McCallum, Hughes-Hallett, Gleason, et al.; Wiley.
○ Summary of Topics: The course covers differential and integral calculus of functions of several variables. Topics include vector valued and scalar functions, partial derivatives, directional derivatives, chain rule, local optimization, double and triple integrals, the line integral, Green's theorem, Stokes' theorem and the Divergence theorem.

A **MATH 313** - **Introduction to Linear Algebra**, *Fall 2023*

3.0 Units
○ Instructor: Kirti Joshi, Ph.D.
○ Final Grade: 94.16%. Grades available here.
○ Syllabus and Policy: Available here. The common course webpage is here.
○ Ranking: Ranked 1st in midterm 2 and final exam in a class of > 40 students.
○ Textbook: Linear Algebra and its Applications, by Lay, Lay, and McDonald.
○ Summary of Topics: Linear Equations in Linear Algebra, Matrix Algebra, Determinants, Vector Spaces, Eigenvalues and Eigenvectors, Orthogonality, and Least Squares.

A **MATH 129** - **Calculus II**, *Spring 2023*

3.0 Units
- Instructor: Dan Lewis
- Final Grade: 93.18%. Grades available here.
- Syllabus and Policy: Available here. The common course webpage is here.
- Textbook: Calculus, Single Variable; 6th edition; Hughes-Hallett, et al.; Wiley.
- Summary of Topics:
  - *Integration:* Integration by Substitution, Integration by Parts, Numerical Methods for Definite Integrals, Improper Integrals, and Comparison of Improper Integrals.
  - *Using the Definite Integral:* Areas and Volumes, Applications to Geometry, Density, and Applications to Physics.
  - *Sequences and Series:* Sequences, Geometric Series, Convergence of Series, Power Series, and Interval of Convergence.
  - *Approximating Functions Using Series:* Taylor Polynomials, Taylor Series, Finding and Using Taylor Series.
  - *Differential Equations:* Slope Fields, Separation of Variables, and Growth and Decay.

A **MATH 125** - **Calculus I**, *Spring 2023*

3.0 Units
- Instructor: Jay Mayfield
- Common Course Webpage: Available here.
- Textbook: Calculus, Single Variable; 6th edition; Hughes-Hallett, et al.; Wiley.
- Summary of Topics: Derivation and Rules, Using the Derivative, The Definite Integral, and Constructing Anti-derivatives.

General Education and Electives

A **ISTA 455** - **Applied NLP**, *Fall 2024*

3.0 Units
- Instructor: Egoitz Laparra
- Final Grade: 98.24%. Grades available here.
- Syllabus and Policy: Available here.
- Summary of Topics: Overview of ML for NLP, Overview of the NLP workflow, Data Acquisition, Manual Annotation, Pre-Processing, Discrete Text Representations, Word Embeddings, Semantic Text Similarity, Text Classification with Linear Regression, The FeedForward Neural Network for NLP, Evaluation Metrics, Sequence Labeling, Reading Comprehension, Sequence to Sequence, Language Modeling, Pre-trained Language Models, PLM Variants, Task Unification, Instructed PLMs

A **ISTA 322** - **Data Engineering**, *Fall 2024*

3.0 Units
- Instructor: Dan Charbonneau
- Final Grade: 99.36%. Grades available here.
- Syllabus and Policy: Available here.
- Summary of Topics: This course will be inviting for a wide variety of students from across disciplines, and they will learn how to use industry standard tools and practices to make large data sets usable for scientists and other decision makers. From data collection and preparation, to the creation of big data stores, databases, or systems to make data flow, this course will focus on the practical work needed to prepare big data for analyses across contexts. Students will be introduced to a variety of technical tools for data management, storage, use, and manipulation.

A **PHYS 141 - Introductory Mechanics**, *Spring 2024*

4.0 Units
- Instructor: Eduardo Rozo
- Final Grade: 94.91%. Grades available here.
- Syllabus and Policy: Available here.
- Summary of Topics: A first course in Newtonian mechanics; introduces freshman-level students to the statics and dynamics of point particles, rigid bodies, and fluids. Topics include vector algebra, projectile and circular motion, Newton's Laws, conservation of energy, collisions and conservation of momentum, rotational dynamics and conservation of angular momentum, statics, harmonic oscillators and pendulums, gravitation and Kepler's Laws, fluid statics and dynamics.

A **HPS 178 - Personal Health and Wellness**, *Spring 2024*

3.0 Units
- Instructor: Adaeze Oguegbu
- Final Grade: 95.75%. Grades available here.
- Syllabus and Policy: Available here.
- Summary of Topics: An introductory course that analyzes personal and community health issues, with an emphasis on current science and public health theory related to primary prevention, health promotion, behavior change and individual health choices. It also provides a basic understanding of how cultural, societal and environmental factors contribute to individual health choice and behavior change.

A **LING 201 - Intro to Linguistics**, *Fall 2023*

3.0 Units
- Instructor: Dr. Diane Ohala
- Final Grade: 96.81%. Grades available here.
- Syllabus and Policy: Available here.
- Summary of Topics: Phonetics, Phonology, Morphology, Syntax, and Semantics.

A **CLAS 160D2 - Classical Mythology**, *Fall 2023*

3.0 Units
- Instructor: Dr. Robert Stephan
- Final Grade: 98%. Grades available here.
- Syllabus and Policy: Available here.

A **CLAS 150C1 - Pyramids and Mummies**, *Fall 2023*

3.0 Units
- Instructor: Dr. Robert Stephan
- Final Grade: 98%. Grades available here.
- Syllabus and Policy: Available here.

A **DNC 101 - Dance Appreciation**, *Fall 2023*

3.0 Units
- Instructor: Erica Julian
- Final Grade: 100%. Grades available here.
- Syllabus and Policy: Available here.

A **BIOS 376 - Introduction to Biostatistics II**, *Spring 2023*

3.0 Units
- Instructor: Antonio Rubio
- Final Grade: 100%. Grades available here.
- Syllabus and Policy: Available here.
- Programming Language: R.
- Summary of Topics: Learning and practicing R programming, Statistics, Data Organization, Measures of Center and Variation, Percentiles, Probability, Normal Distributions, Sampling Distributions, Central Limit Theorem, Confidence Intervals, Hypothesis Testing, Linear Correlation, Linear Regression, and Chi-Square Tests.

A **MCB 181R - Introductory Biology I (Lecture)**, *Spring 2023*

3.0 Units
- Instructor: Susan Hester, Ph.D.
- Final Grade: 95.32%. Grades available here.
- Syllabus: Available here.
- Summary of Topics: Cells, Membranes, Proteins, Mitosis, Meiosis, Transcription, Translation, Gene Regulation, Cell Signaling, Cell Cycle, DNA Replication, Energy, Enzymes, Cellular Respiration, and Photosynthesis.

A **MCB 181L - Introductory Biology Laboratory I**, *Spring 2023*

1.0 Units
- TA: Edwin Umanzor
- Final Grade: 97.23%. Grades available here.
- Syllabus: Available here.
- Lab Manual: Authentic Inquiry through Modeling in Biology.
- Summary of Experiments: Membrane Transport, Bacteria, Computational Cancer, Chlamydomonas, and Yeast.

A **RELI 367 - Yoga**, *Spring 2023*

3.0 Units
- Instructor: Caleb Simmons, Ph.D.
- Final Grade: 100%. Grades available here.
- Syllabus: Available here.

A **ENGL 108 - Foundations Writing for English as an Additional Language Students II**, *Spring 2023*

3.0 Units
- Instructor: Nicholas Halsey
- Final Grade: 92.75%. Grades available here.
- Syllabus: Available here.
- Major Writing Projects: Summary, Response, Critique, Literature Review, Bilingual Re-Design, and Portfolio.

A **ENGL 107 - Foundations Writing for English as an Additional Language Students I**, *Fall 2022*

3.0 Units
- Instructor: Jamey Rogers
- Syllabus: Available here.

A **PFFP 150B2 - Personal Finance Foundations**, *Fall 2022*

3.0 Units
- Instructor: Victoria Ligon, Ph.D.

A **UNIV 101 - Introduction to the General Education Experience**, *Fall 2022*

3.0 Units
- Instructor: Allison Giddings