This packet contains:

- Major Requirements
- CSCI major Flowchart (also can be found at):
  
  https://www.colorado.edu/cs/ba-degree/ba-degree-requirements
- How the CSCI major is different than other A&S Majors
- Getting Involved
- Senior Projects Option
- CSCI Courses

CSCI-BA Advisors:   Eva Lacy & Martin Black

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To make an advising appointment:

1. Go to the Advising Center webpage http://www.colorado.edu/advising/ where you have access to lots of different resources; click the blue box to Make an Appointment
2. This takes you to MyCUHub http://www.colorado.edu/mycuhub/ where you can login
3. Under your photo is a box: Schedule Appointment – choose the appropriate option for “I need help with...”
4. Click Next – you may be directed to additional resources – see if these can help answer your questions
5. Click Schedule an Advisor Appointment Now if you still want to come in for an appointment

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Computer Science B.A. Major Requirements

The CSCI major has four components each of which are detailed below:

1. Math requirements (Calculus and Additional Math)
2. CSCI “Foundations” coursework
3. CSCI “Core” coursework
4. CSCI Upper Division Hours requirements

1. Calculus requirements and course options

- Calculus 1
  - MATH 1300-5: Calculus 1
  - MATH 1310-5: Calculus, Stochastics, & Modeling
  - APPM 1350-4: Calculus 1 for Engineers
- Calculus 2
  - MATH 2300-5: Calculus 2
  - APPM 1360-4: Calculus 2 for Engineers

Additional Mathematics requirement and course options

- At least one of the following
  - CSCI 2820-3: Linear Algebra w/ Comp Sci Applications
  - MATH 3130-3: Linear Algebra
  - APPM 3310-3: Matrix Methods
  - CSCI 3022-3: Intro to Data Science Algorithms
  - MATH 3510-3: Probability and Statistics
  - MATH 4510-3: Intro to Probability Theory
  - APPM 3570-3: Applied Probability
  - APPM 4570-3: Statistical Methods
  - ECON 3818-4: Introduction to Statistics with Computer Applications
  - PSYC 3101-3: Statistics and Research Methods in PSYC – only through Summer 2015

Your choice of course will affect which upper division CSCI classes you will be able to take – SO PLAN AHEAD!

2. Computer Science “Foundations” Includes

- CSCI 1300/CSCI 1310-4: Programming
- CSCI 2270-4: Data Structures
- CSCI 2400-4: Computer Systems
- A Discrete Mathematics Course (options given below)
  - CSCI 2824-3: Discrete Structures
  - MATH 2001-3: Discrete Mathematics
  - APPM 3170-3: Discrete Applied Mathematics (requires Calc 1&2)
3. The CSCI-BA “Core” Includes: your choice of **FOUR** of the following courses:

- CSCI 3104-4: Algorithms
- CSCI 3155-4: Principles of Programming Languages
- CSCI 3202-3: Artificial Intelligence
- CSCI 3287-3: Design & Analysis of Data Systems
- CSCI 3308-3: Software Development Methods & Tools
- CSCI 3434-3: Theory of Computation
- CSCI 3656-3: Numerical Computation
- CSCI 3753-4: Operating Systems
- CSCI 4448-3: Object Oriented Analysis & Design
- CSCI 3002-3: Human Centered Computing Foundations

*Course dependencies within Core: some core courses are required to take others*

4. CSCI Upper Division Hours requirement includes:

- Taking additional upper division CSCI coursework to reach a total of 42 CSCI hours

- The number of additional hours required **will depend** on
  - Whether or not your Discrete Math and Additional Math courses came from CSCI
  - The total number of credit hours you earned from your four CSCI-BA “Core” courses

- Students will typically need an additional 3-5 courses

*Example First 3 Semesters Flowchart: solid arrows are firm pre-requisites, dashed arrows are pre-reqs that depend on course selections*
Computer Science B.A. Degree Requirements Flow Chart: Fall 2016

Computer Science B.A. Foundation
- all courses required (15 hours)
  - CSCI 1300-4 (Beginner) or CSCI 1310-4 (With Experience)
  - CS1: Starting Computing

Computer Science B.A. Core
- Select 4 (12-15 hours)
  - CSCI 3308-3 Software Development
  - CSCI 3002-3 User-Centered Design & Dev
  - CSCI 3753-4 Operating Systems
  - CSCI 4448-3 Object-Oriented Analysis and Design

Computer Science B.A. Core
- Select 4 (12-15 hours)
  - CSCI 2270-4 Computer Science 2: Data Structures
  - CSCI 3155-4 Principles of Programming Languages
  - CSCI 3104-4 Algorithms
  - CSCI 3434-3 Theory of Computation
  - CSCI 2400-4 Computer Systems

Computer Science B.A. Upper Division Electives
- Select additional upper division CSCI courses to bring total to 42 hours
  - ★ CSCI 3702, CSCI 4314

Free Electives
- (approximately 25-27 hours)
  - Select additional Arts & Sciences courses to bring total hours to 120.
    - Can be used to pursue a minor or certificate in another A&S discipline
    - Can also be used to pursue an additional A&S major but that may require more than 120 total hours.

A&S Core
- 40 hours
  - QRMS: Satisfied by Calc 1
  - Written Communication: 6 hours
  - Historical Context: 3 hours
  - Human Diversity: 3 hours
  - U.S. Context: 3 hours
  - Literature & the Arts: 6 hours
  - Natural Science: 13 hours
  - Contemporary Societies: 3 hours
  - Ideals & Values: 3 hours

Linear Algebra*
- CSCI 2820-3
- Linear Algebra w/CS Applications
- or MATH 3130-3 or APPM 3310-3

Calculus 1
- MATH 1300-5, MATH 1310-5, or APPM 1350-4

Calculus 2
- MATH 2300-5 or APPM 1360-4

Discrete Mathematics*
- CSCI 2824-3 Discrete Structures or MATH 2001-3 or APPM 3170-3

Probability/Statistics*
- CSCI 3022-3
- or MATH 3510-3 or MATH 4510-3
- or APPM 3570-3 or APPM 4570-3 or ECON 3818-4

Eva Lacy <eva.lacy@colorado.edu>
www.colorado.edu/cs

* Check 2016-17 course catalog for prerequisites.

Please consult your CSCI-BA degree audit for an accurate reflection of your degree progress.

★ = courses that count for Upper Division Arts & Sciences hours
How the CSCI major is different than other Arts & Sciences Majors

Upper Division CSCI courses do NOT count towards A&S requirement of 30 hours UD coursework in A&S

Credit Breakdown for BA in CSCI:

Need a TOTAL of 90 A&S hours, 30 UPPER DIVISION

A&S Core will only be 40-53 of these credit hours so ANOTHER source is needed, especially for Upper Division ...free electives, another A&S major, A&S minor

The B.A. in Computer Science is different from MOST A&S Majors because most of the CSCI courses you take do NOT count as Arts & Sciences hours – they are Engineering courses.

- You will have to get MANY of your 90 A&S hours (and 30 UD A&S hours) from NON-CSCI courses
  - A&S Core – Upper Division for as much as possible
  - Additional Major
  - Minor
  - Free electives – Upper Division in A&S courses

- Some CSCI courses DO count as A&S Hours
  - CSCI 1300: Programming
  - CSCI 2270: Data Structures
  - CSCI 2400: Computer Systems
  - CSCI 3104: Algorithms
  - CSCI 3155: Principles of Programming languages
  - CSCI 3202: Introduction to Artificial Intelligence
  - CSCI 3434: Theory of Computation
  - CSCI 3656: Numerical Computation
  - CSCI 3702: Cognitive Science
  - CSCI 4314: Algorithms for Molecular Biology
  - are the only upper division courses that count as A&S
Another way to look at it...since you are used to looking at your degree audit...

AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED

University of Colorado Cumulative GPA

* 3.506 GPA

**Overall Semester Credit Hour and GPA Requirements for the College of Arts and Sciences**

You must complete at least 120 credit hours. This calculation excludes courses that exceed college credit hour limitations.

EARNED: 21.0 HOURS
IN PROGRESS 16.0 HOURS
--> NEEDS: 83.0 HOURS

- Complete at least 45 hours on the Boulder campus.
  NEEDS: 45.0 HOURS

- Complete at least 45 credits of upper-division courses.
  NEEDS: 45.0 HOURS

- Complete at least 30 upper-division hours in Arts and Sciences after matriculation into the college.
  Your matriculation was: FA2014
  NEEDS: 30.0 HOURS

+ A cumulative GPA of 2.0 is required.
  3.506 GPA

- Complete at least 90 credit hours in A&S coursework.
  ( 21.0 HOURS TAKEN )
IN-P ---> 16.0 HOURS
NEEDS: 53.0 HOURS

**MAPS Requirements**

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Upper Division CSCI Courses do NOT fulfill these requirements
(there are a few exceptions)
Getting Involved:

Computer Science Undergraduate Advisory Council (CSUAC): CSUAC is composed of current Computer Science undergraduate students as well as other interested students who want to make improvements to the undergraduate Computer Science program.

InnovateCU: InnovateCU started the website Interns2Startups [http://www.interns2startups.com/](http://www.interns2startups.com/), which aims to connect entrepreneurial students with Colorado startup companies. It has also been instrumental in running the Startups to Students job fair that is held annually in the spring.

CU Game Development Club: students interested in video game programming, art, modeling, and design. Work on club projects, present game development tutorials, help with members' personal projects, and sometimes just play games. [www.colorado.edu/studentgroups/CuGameDev](http://www.colorado.edu/studentgroups/CuGameDev)

CU Women in Computing (CUWIC): CUWIC is dedicated to supporting women and diversity in computing. [http://wic.cs.colorado.edu/](http://wic.cs.colorado.edu/)

CU Hacking Club: Interested in Computer Security? Cryptography? Social Engineering? Hacking Competitions? Join the CU Hacking Club! Club meets on a regular basis to discuss a variety of computer security topics, techniques, and tutorials; also participate in hacking competitions during the year. All skill levels and backgrounds welcome. For more info or to stay up to date on events apply for membership to our mailing list: [https://groups.google.com/forum/#!forum/cu-hackers](https://groups.google.com/forum/#!forum/cu-hackers)

Bitcoin Club: The College Cryptocurrency Network (CCN) is an international nonprofit organization dedicated to forming a robust network of college clubs for cryptocurrency education, mining, trading and start-ups. Visit [www.colorado.edu/studentgroups/bitcoin](http://www.colorado.edu/studentgroups/bitcoin) for more information.

Getting an Internship and a Job:

Internships:
- Almost any tech company will have an internship program. Reach out to any company you might have interest in working with.
- Attend the [Career Fairs](#) to collect contact information on a WIDE RANGE of companies
- Look for emails posted about specific internship possibilities
- Attend on-campus recruiting events
- Identify potential internships from CS Jobs Mailing List (see below)
- [Interns2 Startups: Created by CU alumni to connect students with internships](http://www.interns2startups.com/)

Career Possibilities:
- Computer science graduates from the University of Colorado Boulder are engaged in a wide variety of jobs with many different companies in locations all over the world.
- They produce the software and systems that touch lives every day in fields ranging from communications to finance to publishing.
- They are, of course, software developers, but also have become teachers, writers, doctors, lawyers, scientists, military leaders, and entrepreneurs.
- They work at some of the largest, most influential companies in the world, at research institutions, non-profits, and at the smallest start-ups of every type imaginable.
- And many lead highly successful companies that they themselves have founded.
• **Career Services** offers a number of programs and services designed to help you plan your career, including workshops, internships, and placement services after graduation.
  • For an appointment with a career counselor or for more information, call 303-492-6541, or stop by the Center for Community. Get more information at: [http://careerservices.colorado.edu/public/](http://careerservices.colorado.edu/public/)

• **CS Jobs Mailing List**: Join the list and use posted jobs/company descriptions to make contacts for possible internships [http://www.colorado.edu/cs/job-opportunities/jobs-mailing-list](http://www.colorado.edu/cs/job-opportunities/jobs-mailing-list)
Senior Projects Option

SENIOR PROJECTS OPTION: The BA program has established a way for CSCI-BA students to participate in CSCI 4308/4318: Software Engineering Projects I & II in their final two semesters.

If you meet the criteria below and want to sign up for the upcoming Fall, make an appointment with the CSCI-BA advisor. If you are not about to start your senior year, but have an interest in Senior Projects for the future, use the criteria as guidelines for you upcoming course plans.

Please note that CSCI 4308/4318 are controlled enrollment courses. The CS department will give priority to BS students for whom they are a capstone requirement. BA students taking them for elective credit will be enrolled with an over-ride (for existing hours requirement) on a first come, first served basis.

To enroll in CSCI 4308, students must have taken:

- Linear Algebra
- CSCI 1300 – 4 hours
- CSCI 2270 – 4 hours
- CSCI 2824 – 3 hours (or other discrete math option)
- CSCI 2400 – 4 hours
- CSCI 3308 – 3 hours – Software Development Methods and Tools
- CSCI 3155 – 4 hours – Principles of Programming Languages
- At least 2 CS Upper Division courses (Core preferred) in addition to CSCI 3308 & CSCI 3155 – 6-8 hours

- TOTAL 28-30 hours

Other requirements:

- GPA 3.0 or better in CSCI
- Completed Upper Division writing course
- Must have Fall and Spring semesters remaining in plan.

If you are interested or have questions, contact the CSCI-BA advisor to have them review your Degree Audit for the above criteria.

Brief description for CSCI 4308/4318 Software Engineering Projects I & II: see course catalog for full description

- 4308 fall semester is ½ devoted to study of software project management and ½ devoted to work on team project
- 4318 in spring semester is devoted to team project plus weekly seminar series featuring speakers from local industry

Project opportunities will be posted at beginning of fall semester. Second class in fall is Project Fair at which prospective sponsors will be available to meet with students and students will bring resumes to share with sponsors of interest.

- Students will state preferences for project and be placed on team
- Teams retain all ownership of the projects
CSCI Courses: Some pre-reqs and semesters courses are offered may have changed. The online registration system is the most current resource.

Computer Science Courses – B.A.
Note: The minimum grade for all prerequisite courses is a C-.

CSCI-1300 (4) Computer Science 1: Starting Computing
Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Starting Fall 2016 required pre- or co-req of Calculus 1
Generally offered: fall, spring and summer. (Required for BS, BA and minor)

CSCI-1310 (4) Computer Science 1: Starting Computing - Experienced
Intended for students with some prior experience in programming and basic knowledge of variables, conditionals, and loops. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Starting Fall 2016 required pre- or co-req of Calculus 1
Generally offered: fall and spring. (Required for BS, BA and minor)

CSCI-2270 (4) Computer Science 2: Data Structures
Studies data abstractions (e.g., stacks, queues, lists, trees) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications. Prereq., CSCI 1300 or CSCI 1310, and Calculus 1.
Generally offered: fall, spring and summer. (Required for BS, BA and minor)

CSCI-2400 (4) Computer Systems
Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components influence performance and memory hierarchy. Prereq., CSCI 2270.
Generally offered: fall, spring and summer. (Required for BS, BA and minor)

CSCI 2820 (3) Linear Algebra with Computer Science Applications
Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra. Prereq., CSCI 2270 and two semesters of calculus.
Generally offered: fall and spring.

CSCI-2824 (3) Discrete Structures
Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science. Prereq., Calculus 1, Pre-req. or Co-req., CSCI 2270.
Generally offered: fall, spring.

CSCI-3002 (3) HCC Foundations/User-Centered Design and Development 1
Introduces the practice and research of human-centered computing, including the evolution of human-computer interaction to its forms today and the techniques of user-centered design. The course will survey topics that include social computing; tangible computing; mobility; and more. It will cover computing in society at large with respect to domains such as health, education, assistive technology, emergency response, and environment. Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.
Generally offered: fall.
CSCI-3022 (3) Introduction to Data Science Algorithms
Introduces students to the tools, methods, and theory behind extracting insights from data using computer science algorithms. The course covers algorithms that maximize likelihood objective functions; linear prediction algorithms; making decisions based on data assembled from large datasets; discovering and quantifying connections between observations in real-world data such as text and images; and representing and manipulating data on a computer. Pre-reqs., CSCI 2270, Calculus 1
Generally offered: fall.

CSCI-3104 (4) Algorithms
Covers advanced data structures, computational geometry, cryptography, dynamic programming, greedy algorithms, divide-and-conquer, graph algorithms (e.g., depth-first search), network algorithms (e.g., shortest paths), approximation algorithms. Prereq., CSCI 2270, CSCI 2824 (or other discrete math course) and two semesters of calculus.
Generally offered: fall, spring, some summers.

CSCI-3112 (1-3) Human-Centered Computing Professional Development
Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections, and gaming. May be repeated up to 3 total credit hours. Same as ATLS 3112
Generally offered: fall.

CSCI-3155 (4) Principles of Programming Languages
Study fundamental concepts on which programming of languages are based, and execution models supporting them. Topics include values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language. Prereq., CSCI 2270, CSCI 2824 (or other discrete math course).
Generally offered: fall, spring.

CSCI-3202 (3) Introduction to Artificial Intelligence
Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language processing. Introduces artificial intelligence programming. Prereq., CSCI 2270 and CSCI 2824 (or other discrete math course) and one of the following statistics courses: APPM 3570, APPM 4570, APPM 4520, MATH 3510, MATH 4510, CVEN 3227, ECEN 3810 or MCEN 4120.
Generally offered: fall.

CSCI-3287 (3) Design and Analysis of Data Systems
Analyzes design of data systems, including data stored in file systems, database management systems and physical data organizations. Studies calculus of data models, query languages, concurrency and data privacy and security. Prereq., CSCI 3104.
Generally offered: fall and spring

CSCI-3302 (3) Introduction to Robotics
Introduces students to fundamental concepts in autonomous, mobile robotics: mechanisms, locomotion, kinematics, control, perception and planning. The course consists of lectures and lab sessions that are geared toward developing a complex robot controller in a realistic, physics-based multi-robot simulator. Prereq., CSCI 2270 and 2824 (or other discrete math course).
CSCI 3302 and ECEN 3303 are the same course.
Generally offered: fall
CSCI-3308 (3) Software Development Methods and Tools
Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools. Prereq., CSCI 2270.
Generally offered: fall, spring and summer

CSCI-3434 (3) Theory of Computation
Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions. Prereq., CSCI 3104 and 3155.
Generally offered: spring

CSCI-3656 (3) Numerical Computation
Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Topics include floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration. Prereq., CSCI 1300 or CSCI 1310, two semesters of calculus, and linear algebra. Generally offered: spring

CSCI-3702 (3) Cognitive Science
Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving, and judgment. Emphasizes the nature, implications, and limitations of the computational model of mind. Prereq., two of the following: PSYC 2145, LING 2000, CSCI 1300, and PHIL 2440. Same as LING 3005, PHIL 3310, and PSYC 3005.
Generally offered: fall

CSCI-3753 (4) Design and Analysis of Operating Systems
Examines the structure and function of operating systems as an intermediary between applications and computer hardware. Fundamental OS concepts such as multitasking, process and thread abstractions, accessing input/output devices, synchronization, avoiding deadlock, scheduling, the virtual memory abstraction, file systems, security and networking are covered. Prereq., CSCI 2270 and CSCI 2400.
Generally offered: fall

CSCI-4229 (3) Computer Graphics
Studies design, analysis, and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation, and projection. Also involves removal of hidden edges, shading, and color. Knowledge of basic linear algebra is required. Prereq., CSCI 2270.
Generally offered: fall, spring

CSCI-4239 (3) Advanced Computer Graphics
Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing. Prereq., CSCI 4229.
Generally offered: spring

CSCI-4253 (3) Datacenter Scale Computing
Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. The course examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design. Recommended prereq., CSCI 4273. Prereq., CSCI 3753. Restricted to students with 57-180 credits (Juniors or Seniors).
Generally offered: fall
CSCI-4273 (3) Network Systems
Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call, and other contemporary network system design and programming techniques. Prereq., CSCI 3753.
Generally offered: fall

CSCI-4302 (3) Advanced Robotics
Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program. Same as CSCI 5302. Prereq., CSCI 3302.
Offered infrequently

CSCI-4314 (3) Algorithms for Molecular Biology
Surveys molecular biology and combinatorial algorithms used to understand DNA, RNA, and proteins. Students work in groups to define and tackle meaningful biological problems, and learn to collaborate effectively with scientists in other disciplines. Recommended prereq., comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline. Same as MCDB 4314. Prereq., CSCI 3104
Generally offered: spring

CSCI-4413 (3) Computer Security and Ethical Hacking
Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks. Prereq., CSCI 2400 and CSCI 4273.
Generally offered: spring

CSCI-4446 (3) Chaotic Dynamics
Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension, and Lyapunov exponents. Recommended prereq., PHYS 1120, CSCI 3656, and MATH 3130. Prereq., CSCI 1300/1310/1320, Calculus 3. Same ECEN 4423.
Generally offered: spring

CSCI-4448 (3) Object-Oriented Analysis and Design
An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design, and modeling notations. Students apply the techniques in analysis and design projects. Prereq., CSCI 3155 and CSCI 3308.
Generally offered fall, spring

CSCI-4502 (3) Data Mining
Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to scalability and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data. Prereq., CSCI 2270.
Generally offered spring

CSCI-4555 (3) Compiler Construction
Introduces the basic techniques used in translating programming languages: scanning, parsing, definition table management, operator identification and coercion, code selection and register allocation, error recovery. Students build a complete compiler for a simple language. Prereq., CSCI 2400 and CSCI 3155. Same as ECEN 4553.
Offered infrequently
CSCI-4576 (4) High-Performance Scientific Computing
Introduces computing systems, software, and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence. Recommended prereq., CSCI 3656. Generally offered fall

CSCI-4586 (4) High-Performance Scientific Computing 2
Introduces computing systems, software, and methods to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. Second course in a two-semester sequence. Prereq., CSCI 4576. Offered infrequently

CSCI-4753 (3) Computer Performance Modeling
Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization, and analysis of data; design of experiments; simulation; and queuing theory and queuing network models. Recommended prereq., a course in statistics. Prereq., CSCI 3753 and two semesters Calculus. Same as ECEN 4753. Generally offered spring

CSCI-4809 (3) Computer Animation
Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out. Same as ATLS 4809. Generally offered fall, summer

CSCI-4810 (1) Seminar in Computational Biology
Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project. Offered infrequently

CSCI-4830 (1-3) Special Topics in Computer Science
Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester. May be repeated up to 9 total credit hours. Prereq., CSCI 2400. Generally offered fall, spring and summer

CSCI-4900 (1-3) Upper Division, Undergraduate Level Independent Study
Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students. Prereq., CSCI 1300 or CSCI 1310. Generally offered fall, spring and summer