



Bachelor of Science in
Computer Science

Advising Brochure
2018 – 2019

Department of
Computer Science & Engineering
College of Arts & Sciences

256 Avery Hall

cseadvising@unl.edu
<http://cse.unl.edu/advising>

The B.S. Degree in Computer Science is accredited by
the Computing Accreditation Commission of ABET.
<http://www.abet.org>

rev: June 11, 2018

Computer Science Major Requirements

72-73 Hours of CSCE, MATH, and Natural Science Courses

Computer Science & Engineering Courses: (45-46 hours)

- Max 6 hrs P/NP for CSCE with permission (3 for MATH if minor)
- Min 13 hrs (9 built-in) of CSCE/RAIK/MATH @ 400 level
- Min grade of C for CSCE, RAIK, and minor courses
- Returning for 2nd degree? Jump to MS after just the marked courses below. **p**: prereq to doing MS, **d**: deficiency (ok to do during MS)

	Course	Title	Raikes		Hrs
			RAIK	Hrs	
	CSCE 10	CSE Freshman Seminar		0	0
p	CSCE 155	Introduction to Comp Sci I	183H	4	3
p	CSCE 156	Introduction to Comp sci II	184H	4	4
p	CSCE 231	Computer System Engr		4	4
p	CSCE 235	Introduction to Discrete Struct	(283H)	0	3
	CSCE 251	Unix Programming		1	1
p	CSCE 310	Data Structures & Algos	283H	3	3
d	CSCE 322	Programming Lang Concepts		3	3
	CSCE 361	Intro to Software Engineering	383H	3	3
	CSCE 486	CS Professional Development	401H	3	3
	CSCE 487	CS Senior Design Project	402H	3	3
d	CSCE 351/451	OS Kernels or OS Principles		3	3
	CSCE 423/428	Des & An Algos or Automata		3	3
	CSCE 3/4 _____	<i>Technical Elective - lecture</i>	370H	3	3
	CSCE 3/4 _____	<i>Technical Elective - lecture</i>	371H	3	3
	CSCE 3/4 _____	<i>Technical Elective</i>	403H	3	3
		(Raikes only <i>Technical Elective</i>)	404H	<u>3</u>	<u> </u>
				46	45
Mathematics Courses:					
p	MATH 106	Calculus I		5	5
p	MATH 107	Calculus II		4	4
d	MATH 314	Linear Alg (Matrix Theory)		3	3
d	STAT 380	Statistics & Applications	270,370	<u>3</u>	<u>3</u>
	Add MATH 208	Calculus III (4 hr) for Math Minor!		15	15

Natural Science Courses:

12

Criteria: quantitative, suitable for majors in that field. Must include a lab (**bold face**). The following satisfy the criteria:

- CHEM **109 & 110** or **113 & 114** and **221**, 261/**262**, 263/**264**
- PHYS **141** or 211/**221**, **142** or 212/**222**, 213/**223**
- ASTR 204/**224**
- LIFE 120/**120L**, 121/**121L** BIOS 206/**205**, **207**
- GEOL **101**, **103**, **210**, **211**, **310**, **340**
- METR **100**, 205, **223**, 311, 312, **323**, **341**
- GEOG **155**, 181
- ANTH 242/**242L**

Computer Science Major Requirements

I. Major Area of Study: 72 hours		
Computer Science / Raikes	45	
(Earn an optional Focus with all 3 technical electives in one area - see listings)		
Mathematics	15	
Natural Science	12	
II. Minor Area of Study: Suggest MATH 208 to complete the Mathematics minor!		4-18
III. ACE Student Learning Outcomes: 6-18 hours		
Max of 9 hrs in any one depart for ACE 4-10		Raikes
1. Written Communication	–	3
2. Oral Communication	–	3
3. Math & Computation	–	–
4. Natural Sciences	–	–
5. Humanities/History	3	3
6. Social Sciences	–	3
7. Fine Arts	3	3
8. Ethics	–	–
9. Human Diversity	3	3
10. Integrated Knowledge	–	–
See http://ace.unl.edu/ for details and listings.		
IV. College Distribution Requirements: 9-25 hours		
(In addition to and distinct from ACE)		
A. Written Communication (another ACE 1)	3	
B. Math and Science	–	
C. Humanities/History (CLAS,ENGL,HIST,PHIL,RELG)	3	
D. Social Sciences (ANTH,COMM,GEOG,POLS,PSYC,SOCI)	3	
E. Foreign Language 101 ₅ , 102 ₅ , 201 ₃ , 202 ₃ or accelerated options: 110 ₆ , 210 ₆ (complete 202, 4 years HS, or foreign HS)	0-16	
F. Additional C or D not from CSCE	–	
V. Electives: 0-17 hours		0-17
Total hours for the degree:		120

CSCE Technical Electives

Informatics Focus:

- 411 Data Modeling for Systems Dev
- 412 Data Visualization
- 413 Database Systems
- 464 Internet Systems & Programming
- 470 Computer Graphics
- 471 Bioinformatics
- 472 Digital Image Processing
- 473 Computer Vision
- 474 Data Mining

Artificial Intelligence Focus:

- 421 Foundations of Constraint Satisfaction Th
- 475 Multiagent Systems
- 476 Artificial Intelligence
- 478 Machine Learning
- 479 Deep Learning

Networking & High-End Computing Focus:

- 236 Intro Embedded Systems
- 351 Operating System Kernels
- 430 Computer Architecture
- 435 Cluster & Grid Computing
- 436 Advanced Embedded Systems
- 438 Sensor Networks
- 439 Robotics
- 451 Operating System Principles
- 455 Distributed Operating Systems
- 456 Parallel Algorithms & Programming
- 457 Systems Administration
- 458 Molecular & Nanoscale Communication
- 459 Genetically Engineered Systems
- 462 Communication Networks
- 463 Data & Network Security
- 465 Wireless Communication Networks

Foundations Focus:

- 421 Foundations of Constraint Satisfaction Th
- 423 Design & Analysis of Algorithms
- 428 Automata, Computation & Formal Languages
- 440 Numerical Analysis
- 477 Cryptography & Computer Security

Software Engineering related (not a focus):

- 378 Human Computer Interaction
- 425 Compiler Construction
- 454 Human-Robot Interaction
- 460 Software Engineering for Robotics
- 461 SOFT Adv Topics in Software Engineering
- 464 Internet Systems & Programming
- 466 SOFT Software Design and Architecture
- 467 SOFT Testing, Verification and Analysis
- 468 SOFT Requirements Elic, Modl and Analysis

Non-Lecture Technical Electives:

399H Honors Thesis
491 Internship for Credit
403H Design Studio 3
404H Design Studio 4
493 ILab Project
498 Independent Study
(limit of 3 hours as tech elec, another 3 as pure elective)

Recent CSCE 496 Special Topics Electives

Title	Focus Area
Algorithms - Large Scale Data	Informatics
AI and Heuristics in Software Engr	
Computational Methods in Bioinfo	Informatics
Exploring Virtual Reality	Informatics
Multiway Data Analysis	Informatics
Perf Optimztn Comp System&Netwk	Networking & High End
Real-Time Systems	Networking & High End
Queuing Models	Foundations
Self-Managing Comp Sys	Networking & High End
Software Engineering Robotics	

Math Double Majors

Math accepts one of CSCE 423 and 428 to double-dip as a major elective. Computer Science accepts one from the following to double-dip as a technical elective. (Crosslisted courses always double-dip.)

MATH 428	Principles of Operations Research
MATH 433	Nonlinear Optimization
MATH 439	Math Models in Biology
MATH 450	Combinatorics
MATH 452	Graph Theory
MATH/CSCE 440	Numerical Analysis
MATH/CSCE 447	Numerical Linear Algebra

Recent Changes in the Program

ACE has been in effect since 2009. Beginning in 2012 the number of hours for the degree dropped from 125 to 120. Also, the College Distribution (CD) Requirement dropped the second course in History/Humanities.

Beginning in 2013, a restriction was placed on the choices for technical electives: At least 6 of the hours now need to be in lecture-based courses.

In 2014 a zero credit hour CSCE 10 Orientation course was added to the requirements.

In 2017 CSCE 231 replaced CSCE 230, and CSCE 235 will be a prerequisite.

Example Eight Semester Schedule - 120 hrs

Fall 1				Spring 1			
CSCE	10	CS Sem	0	CSCE	156	CS II	4
CSCE	155	CS I	3	CSCE	235	Discrete	3
MATH	106	Calc I	5	CSCE	251	Unix	1
		ACE 1	3	MATH	107	Calc II	4
Lang	201	Language	3	Lang	202	Language	3
			<u>14</u>				<u>15</u>
Fall 2				Spring 2			
CSCE	310	Algos	3	CSCE	231	Syst Org	4
Elect		MATH 208?	4	CSCE	361	Soft Engr	3
NatSci		(with lab)	4	MATH	314	Lin Alg	3
		ACE 2	3	NatSci		(with lab)	4
		CDR A	3				<u>14</u>
			<u>17</u>				
Fall 3				Spring 3			
CSCE	322	Lang Conc	3	CSCE	3/4XX	elective	3
STAT	380	Stats	3	CSCE	3/4XX	elective	3
NatSci			4			CDR C	3
		ACE 5	3			CDR D	3
		ACE 6	3			ACE 7	3
			<u>16</u>				<u>15</u>
Fall 4				Spring 4			
CSCE	351	or 428	3	CSCE	423	or 451	3
CSCE	3/4XX	elective	3	CSCE	487	CS Sen Des	3
CSCE	486	CS Prof	3			ACE 9	3
Elect			3	Elect			3
Elect			3	Elect			2
			<u>15</u>				<u>14</u>

Departmental Advising:

<http://cse.unl.edu/advising>

Charles Riedesel (Department Advisor) 259 Avery, 472-3486, *chuckr@unl.edu*
 (calendar at *<http://cse.unl.edu/~riedesel>* follow link to appointments)

Ann Koopmann (Department Advisor) 269 Avery, 472-3678

akoopmann1@unl.edu

use *MyPlan* to schedule appointments

General College Advising:

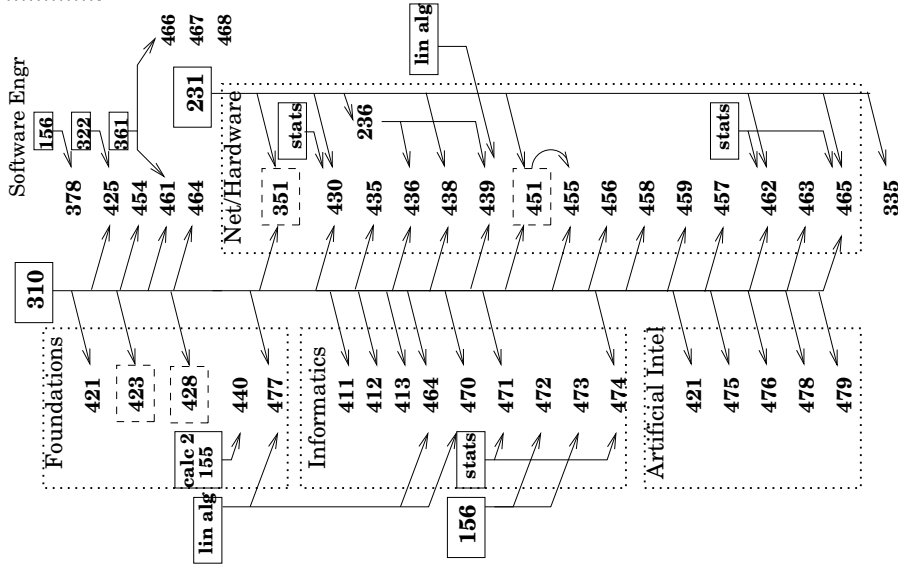
Arts & Sciences Advising Center, 107 Oldfather Hall 472-4190,

<http://cas.unl.edu/advising>

Transfer Students - Equivalencies:

<http://admissions.unl.edu/nebraska/equivalency.aspx>

TECHNICAL ELECTIVES

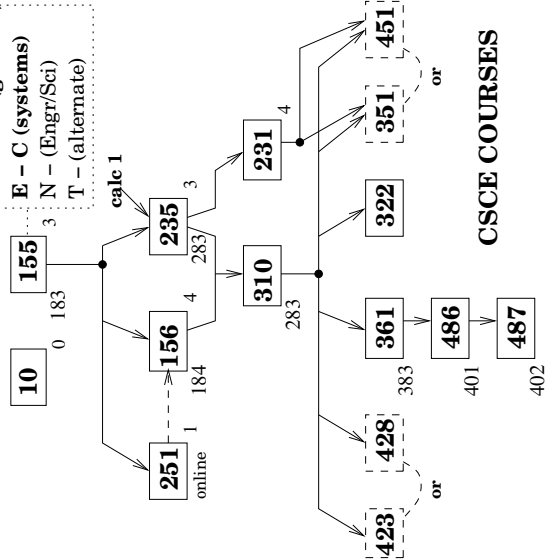


MINOR IN COMPUTER SCIENCE
 CSCE155, 156, plus 11 hrs of
 electives (at least one at 3/400 level)

155T₃ for minors only!
 alternative to 310
 311₃ for many upper
 level courses

advised: ↗
 corequisite: →
 prerequisite: ↖
 required: 310
 depth elective: 423
 RAIK # → 310₃ ← hours
 CSCE #

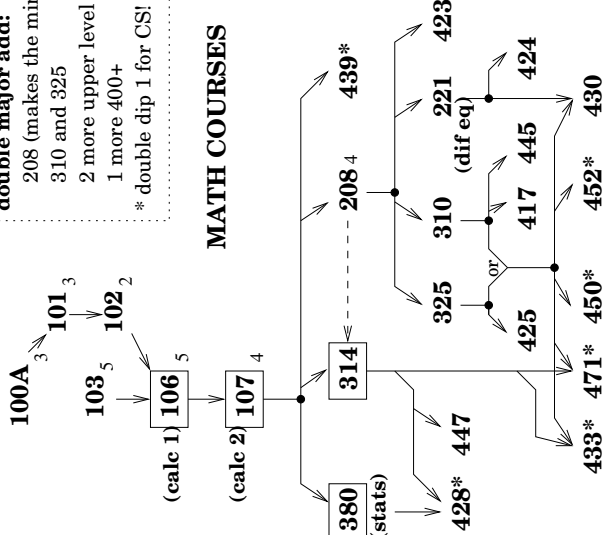
A - Java (general)
 E - C (systems)
 N - (Engr/Sci)
 T - (alternate)



CSCE COURSES

double major add:
 208 (makes the minor)
 310 and 325
 2 more upper level
 1 more 400+
 * double dip 1 for CS!

MATH COURSES



COMPUTER SCIENCE PROGRAM

Computer Science & Engineering and Supporting Courses

See <http://www.math.unl.edu/resources/undergraduate/impe/> for Math Placement Exam
 rev 6/6/2018