UNIVERSITY OF Nebraska Lincoln

Pioneering new frontiers.

Bachelor of Science in

Computer Science

Advising Brochure
2013 − 2014

Department of

Computer Science & Engineering
College of Arts & Sciences

256 Avery Hall

advising@cse.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: May 20, 2013

Computer Science Major Requirements

Computer Science & Engineering Courses:

max 6 hrs P/NP with permission; 13+ hrs @ 400 level for non-Raikes.
★ new constraint for fall 2013: 6+ hrs lecture-based technical electives.
+ prereq for, ! deficiency for graduate school.

	Course	Title	RAIK	Hrs
+	CSCE 155	Introduction to Comp Sci I	183	3
+	CSCE 156	Introduction to Comp sci II	184	4
+	CSCE 230	Computer Organization	284	4
+	CSCE 235	Introduction to Discrete Struct	(283)	3
	CSCE 251	Unix Programming		1
+	CSCE 310	Data Structures & Algos	283	3
!	CSCE 322	Programming Lang Concepts		3
	CSCE 361	Intro to Software Engineering	383	3
	CSCE 486	CS Professional Development	381&2	2
	CSCE 487	CS Senior Design Project	402	3
!	CSCE 351 or 451	OS Kernels or OS Principles		3
	CSCE 423 or 428	Des & An Algos or Automata		3
	CSCE 3/4 ____	*Technical Elective - lecture ★*	378	3
	CSCE 3/4 ____	*Technical Elective - lecture ★*		3
	CSCE 3/4 ____	*Technical Elective*	301	3
		(Raikes only *Technical Elective*)	401	(3)
				44

Mathematics Courses:

	Course	Title	Hrs
+	MATH 106	Analytic Geom & Calculus I	5
+	MATH 107	Analytic Geom & Calculus II	4
!	MATH 314	Linear Alg (Matrix Theory)	3
!	STAT 380	Statistics & Applications	3
			15

Natural Science Courses: 12

Must include two labs (**bold face**) from one area. Choose from the following areas:

- CHEM **109**, **110**, **221** or CHEM **113**, 114
- PHYS 211/**221**, 212/**222**, 213/**223**, ASTR 204/**224**
- LIFE 120/**120L**, 121/**121L**, BIOS **109**, **111**, 112/**112L**, 206/**112L**, 206/**205**, **207**
- GEOL **101**, **103**, **210**, 212, METR **200**, 205, 370
- GEOG **155**, 181
- ANTH 242/**242L**

CSCE Technical Electives

Informatics Focus:

413	Database Systems	fe
464	Internet Systems & Programming	
470	Computer Graphics	fe
471	Bioinformatics	so
472	Digital Image Processing	f
473	Computer Vision	so
474	Data Mining	se

Artificial Intelligence Focus:

421	Foundations of Constraint Sat Theory	fe
475	Multiagent Systems	fo
476	Artificial Intelligence	se
478	Machine Learning	fe

Networking & High-End Computing Focus:

430	Computer Architecture (grad school def.)	f
432	High-Performance Processor Architectures	fo
434	VLSI Design	
435	Cluster & Grid Computing	fo
436	Advanced Embedded Systems	s
437	File & Storage Systems	fe
438	Sensor Networks	se
439	Robotics	fo
455	Distributed Operating Systems	so
456	Parallel Algorithms & Programming	fe
462	Communication Networks	s
463	Data & Network Security	se

Foundations Focus:

340	Numerical Analysis	f
421	Foundations of Constraint Sat Theory	fe
423	Design & Analysis of Algorithms	s
424	Computational Complexity Theory	fe
428	Automata, Computation, & Formal Languages	f
477	Cryptography & Computer Security	su

Software Engineering Focus:

378	Human Computer Interaction	s
425	Compiler Construction	se
461	Software Engineering II	
464	Internet Systems & Programming	
493	ILab Project (or 301/2,401/2 DS)	

Additional Choices:

351	Operating System Kernels	f
399H	Honors Thesis	fssu
451	Operating System Principles	s
457	Systems Administration	fe
491 & 498	Internship & Computer Problems	fssu

Recent CSCE 496 Special Topics Electives

Title	Focus Area
Coordination in Global Software Dev (so)	Software Engr
Multiway Data Analysis (se)	Informatics
Self-Managing Comp Sys (so)	
Software Architechure	Informatics
Wireless Communication Networks	Networking ...

Math Courses as Technical Electives

One non-crosslisted math course can be used as a technical elective for Computer Science, and can also double dip for a Mathematics double major. Crosslisted courses may always double dip.

MATH/CSCE 340	Numerical Analysis	f
MATH 428	Principles of Operations Research	s
MATH 432	Linear Optimization	?
MATH 433	Nonlinear Optimization	so
MATH 439	Math Models in Biology	?
MATH/CSCE 441	Approximation of Functions	?
MATH/CSCE 447	Numerical Analysis II	so?
MATH 450	Combinatorics	fs?
MATH 452	Graph Theory	so

Recent Changes in the Program

Many students currently under earlier bulletin years in which ACE has been in effect (2009-11) may wish to switch to a newer bulletin year (2012-). Two important changes have been made. First, the number of hours for the degree has dropped from 125. Second, the College Distribution (CD) Requirement has dropped the second course in History/Humanities, replacing it wth a broader choice from any of areas B, C, and D. Any of our required MATH courses easily covers it.

Beginning this year, 2013, there is a restriction placed on the choices for technical electives. At least 6 of the hours will need to be in lecture-based courses. This will limit the number of internship, indedendent study, and Design Studio courses that can apply.

Computer Science Degree Requirements

I. Major Area of Study:
    Computer Science (C or higher required in CSCE)   44
    Mathematics   15
    Natural Science   12
    Earn a **focus** with 3 technical elective courses in one area!

II. Minor Area of Study: Suggest MATH 208 for Mathematics!

III. ACE Student Learning Outcomes:
Max of 9 hrs in any one department for ACE 4-10.

1.	Written Communication (in Raikes)	3
2.	Oral Communication (in Raikes)	3
3.	Math & Computation (all in major)	–
4.	Natural Sciences (all in major)	–
5.	Humanities/History	3
6.	Social Sciences (in Raikes)	3
7.	Fine Arts	3
8.	Ethics (all in major)	–
9.	Human Diversity	3
10.	Integrated Knowledge (all in major)	–

See http://ace.unl.edu/ for details and listings.

IV. College Distribution (CD) Requirements:
(In addition to and distinct from ACE)

A.	Written Communication (another ACE 1)	3
B.	Math and Science (all in major)	–
C.	Humanities/History	3
	(CLAS,ENGL,HIST,PHIL,RELG)	
D.	Social Sciences	3
	(ANTH,COMM,GEOG,POLS,PSYC,SOCI)	
E.	Foreign Language $101_5, 102_5, 201_3, 202_3$	0-16 $\star$
F.	Additional CD not from CSCE	–

$\star$ 2 semesters at 200 level **or** 4 years H.S. **or** English second language.

Total hours for graduation: 120, of which typically 71 are in the major, 4 in the Math minor, and 27–43 in the General Studies (ACE and CD), leaving up to 18 as pure electives.

Example Eight Semester Schedule - 120 hrs

	Fall 1		
CSCE	155A	CS I	3
MATH	106	Calc I	5
		ACE 1	3
Lang	201	Language	3
			14

	Spring 1		
CSCE	156	CS II	4
CSCE	235	Discrete	3
CSCE	251	Unix	1
MATH	107	Calc II	4
Lang	202	Language	3
			15

	Fall 2		
CSCE	310	Algos	3
Elect		MATH 208?	4
NatSci		(with lab)	4
		ACE 2	3
		CD A	3
			17

	Spring 2		
CSCE	230	Comp Org	4
CSCE	361	Soft Engr	3
MATH	314	Lin Alg	3
NatSci		(with lab)	4
			14

	Fall 3		
CSCE	322	Lang Conc	3
STAT	380	Stats	3
NatSci			4
		ACE 5	3
		ACE 6	3
			16

	Spring 3		
CSCE	3/4XX	elective	3
CSCE	3/4XX	elective	3
		CD C	3
		CD D	3
		ACE 7	3
			15

	Fall 4		
CSCE	351	or 428	3
CSCE	3/4XX	elective	3
CSCE	486	CS Prof	2
Elect			3
Elect			3
			14

	Spring 4		
CSCE	423	or 451	3
CSCE	487	CS Sen Des	3
		ACE 9	3
Elect			3
Elect			3
			15

Departmental Advising:
http://cse.unl.edu/advising
Charles Riedesel (Chief Undergraduate Adviser)
259 Avery Hall, 472-3486, chuckr@unl.edu
Chris Bourke (Undergraduate Adviser)
363 Avery Hall, 472-5008, cbourke@cse.unl.edu

General College Advising:
Arts & Sciences Advising Center, 107 Oldfather Hall 472-4190,
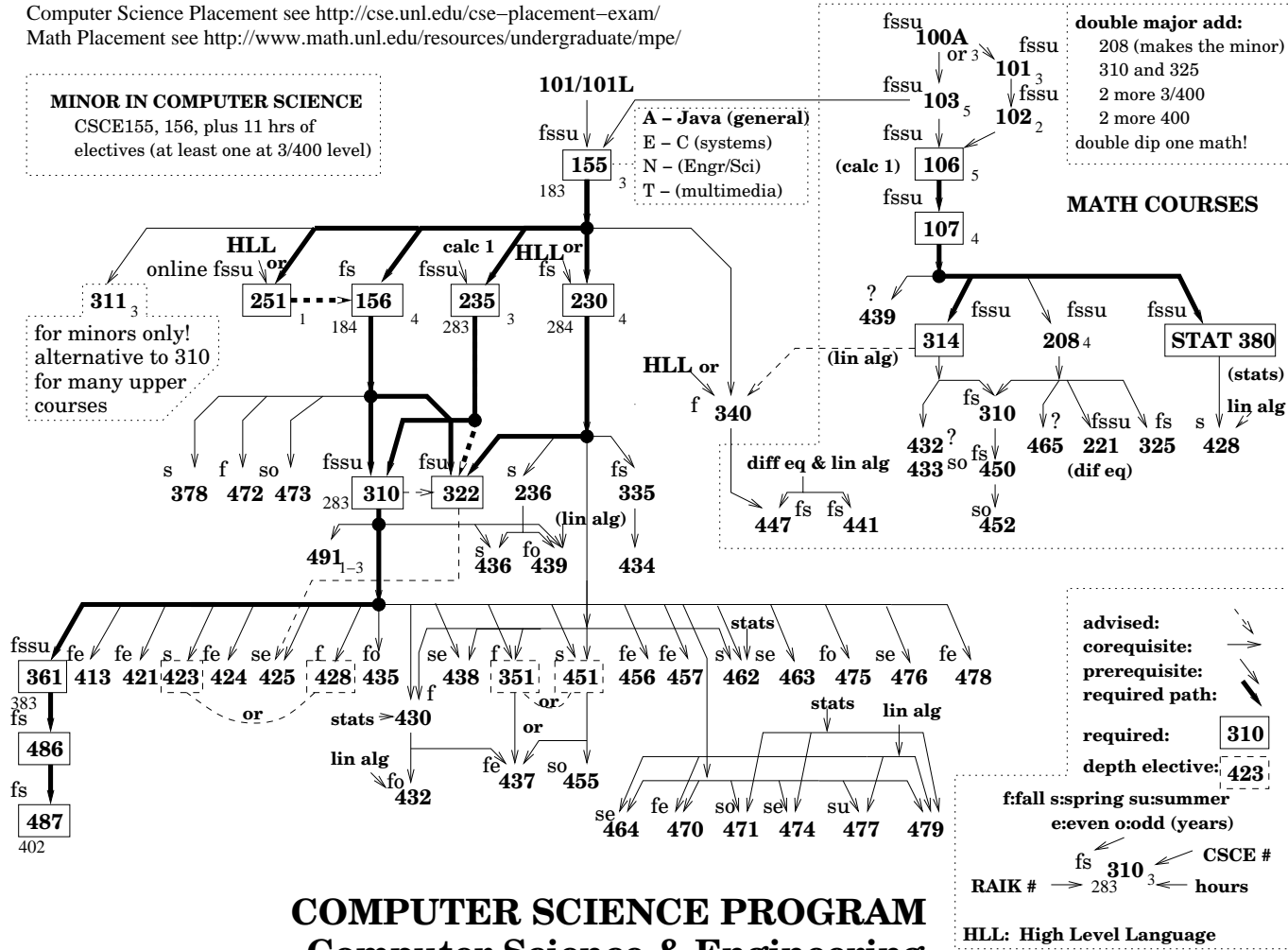http://cas.unl.edu/advisingcenter.html

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

101/101L

fssu

155
183   3

A – Java (general)
E – C (systems)
N – (Engr/Sci)
T – (multimedia)

fssu
100A
or 3   fssu
101 3
fssu
103 5   fssu
102 2
fssu

double major add:
208 (makes the minor)
310 and 325
2 more 3/400
2 more 400
double dip one math!

(calc 1) **106** 5

fssu

107 4

MATH COURSES

HLL
online fssu **or**   **fs**   **calc 1**
fssu   **HLL or**
fs

311 3

for minors only!
alternative to 310
for many upper
courses

251 ⤑ **156**   **235**   **230**
1   184   4   283   3   284   4

HLL or
f   **340**

?
439   fssu **314**   fssu **208** 4   fssu **STAT 380**
(lin alg)   **(stats)**
lin alg

fs 310   **?** fssu **fs**   s
432 ?   fs **465** **221** **325**   **428**
433 so **450**   **(dif eq)**
so
452

diff eq & lin alg
fs   fs
447   **441**

s   f   so
378 **472** **473**   fssu **310**   fssu **322**   s **236**   fs **335**
283   283

(lin alg)
s   fo
436 **439**   **434**

491 1–3

fssu   fe   fe   s   fe   se   f   fo   se   f   s   fe   fe   s   se   fo   se   fe
361   **413** **421** **423** **424** **425**   **428** **435**   **438** **351** **451**   **456** **457**   **462** **463** **475** **476** **478**
383
fs
486   **or**   **stats ⤐ 430**   **or**   **stats**   **lin alg**

fs
487   lin alg   fe   so
402   fo **432**   **437** **455**   se   fe   so   se   su   fe
464 **470** **471** **474** **477** **479**

advised:
corequisite:
prerequisite:
required path:

required: **310**

depth elective: **423**

f:fall s:spring su:summer
e:even o:odd (years)

fs   **310** 3   **CSCE #**
RAIK # → 283   ← **hours**

HLL: High Level Language

COMPUTER SCIENCE PROGRAM
Computer Science & Engineering
and Supporting Courses

rev 5/14/2013