

UNIVERSITY OF  
**Nebraska**  
Lincoln

*Pioneering new frontiers.*

Bachelor of Science in  
**Computer Science**

Advising Brochure  
**2010 – 2011**

Department of  
**Computer Science & Engineering**  
**College of Arts & Sciences**

256 Avery Hall

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<http://cse.unl.edu>

rev: June 4, 2010

## Computer Science Major Requirements

### Computer Science & Engineering Courses:

*up to 6 hrs P/N with permission and at least 13 hrs of 400 level CSCE (if not in Raikes School)*

| Course          | Title                           | RAIK  | Hrs        |
|-----------------|---------------------------------|-------|------------|
| CSCE 155        | Introduction to Comp Sci I      | 183   | 4          |
| CSCE 156        | Introduction to Comp sci II     | 184   | 4          |
| CSCE 230        | Computer Organization           | 284   | 3          |
| CSCE 230L       | Computer Organization Lab       | (284) | 1          |
| 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 —      | <i>Technical Elective</i>       | 301   | 3          |
| CSCE 3/4 —      | <i>Technical Elective</i>       | 302   | 3          |
| CSCE 3/4 —      | <i>Technical Elective</i>       | 401   | 3          |
|                 | (Raikes only - AI or HCI)       | 496   | <u>(3)</u> |
|                 |                                 |       | <u>45</u>  |

### Mathematics Courses:

|          |                             |          |
|----------|-----------------------------|----------|
| MATH 106 | Analytic Geom & Calculus I  | 5        |
| MATH 107 | Analytic Geom & Calculus II | 5        |
| MATH 314 | Linear Alg (Matrix Theory)  | 3        |
| STAT 380 | Statistics & Applications   | <u>3</u> |
|          |                             | 16       |

### 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, 114/116**
- PHYS **211/221, 212/222, 213/223, ASTR 204/224**
- BIOS **102, 103, 109, 111, 112/112L, 206/112L, 206/205, 207**
- GEOL **101, 103, 210, 212**
- METR **200, 205, 370**
- ANTH **242/242L**

## CSCE Technical Electives

| CSCE                                          | Course Title                              | Frequency |
|-----------------------------------------------|-------------------------------------------|-----------|
| <b>Informatics focus options:</b>             |                                           |           |
| 410                                           | Information Retrieval Systems             |           |
| 413                                           | Database Systems                          | fe        |
| 464                                           | Internet Systems & Programming            | se        |
| 470                                           | Computer Graphics                         |           |
| 471                                           | Bioinformatics                            | se        |
| 472                                           | Digital Image Processing                  | f         |
| 473                                           | Computer Vision                           | so        |
| 474                                           | Data Mining                               | fe        |
| <b>Artificial Intelligence focus options:</b> |                                           |           |
| 421                                           | Foundations of Constraint Sat Theory      | so        |
| 475                                           | Multiagent Systems                        | fo        |
| 476                                           | Artificial Intelligence                   | so        |
| 478                                           | Machine Learning                          | fe        |
| 479                                           | Neural Networks                           |           |
| <b>Networking &amp; High-End Computing:</b>   |                                           |           |
| 430                                           | Computer Architecture (grad school def.)  | s         |
| 432                                           | High-Performance Processor Architectures  | fo        |
| 434                                           | VLSI Design                               | fe        |
| 435                                           | Cluster & Grid Computing                  | fo        |
| 437                                           | File & Storage Systems                    | so        |
| 455                                           | Distributed Operatings Systems            | fe        |
| 456                                           | Parallel Algorithms & Programming         | fe        |
| 462                                           | Communication Networks                    | s         |
| <b>Foundations focus options:</b>             |                                           |           |
| 340                                           | Numerical Analysis                        | f         |
| 421                                           | Foundations of Constraint Sat Theory      | so        |
| 423                                           | Design & Analysis of Algorithms           | s         |
| 424                                           | Computational Complexity Theory           | se        |
| 428                                           | Automata, Computation, & Formal Languages | f         |
| 477                                           | Cryptography & Computer Security          |           |
| <b>Additional Choices:</b>                    |                                           |           |
| 351                                           | Operating System Kernels                  | f         |
| 378                                           | Human Computer Interaction                | se        |
| 399H                                          | Honors Thesis                             | fssu      |
| 425                                           | Compiler Construction                     | fo        |
| 451                                           | Operating System Principles               | se        |
| 457                                           | Systems Administration                    | fe        |
| 491 & 498                                     | Internship & Computer Problems            | fssu      |

## Recent CSCE 496 Special Topics Electives

| <b>Title</b>                   | <b>Focus Area</b>     |
|--------------------------------|-----------------------|
| Data and Network Security (se) | Networking & High End |
| Embedded Systems (s)           | Networking & High End |
| Self-Managing Comp Sys (fo)    |                       |
| Software Architechure (fe)     | Informatics           |
| Sensor Networks (fe)           | Networking            |

## Math Courses as Technical Electives

|          |                                   |    |
|----------|-----------------------------------|----|
| MATH 428 | Principles of Operations Research | s  |
| MATH 432 | Linear Optimization               | fe |
| MATH 433 | Nonlinear Optimization            | so |
| MATH 439 | Math Models in Biology            | s? |
| MATH 441 | Approximation of Functions        | f? |
| MATH 447 | Numerical Analysis II             | f  |
| MATH 450 | Combinatorics                     | fo |
| MATH 452 | Graph Theory                      | se |

## Computer Science Degree Requirements

### I. Major Area of Study:

|                                                 |    |
|-------------------------------------------------|----|
| Computer Science (C or higher required in CSCE) | 45 |
| Mathematics                                     | 16 |
| Natural Science                                 | 12 |
| Focus (optional)                                | 9  |

The focus is earned by taking 3 courses in any one area (see page 3) in addition to all other major requirements.

### II. Minor Area of Study:

Only MATH 208 is needed for a Mathematics minor. A second minor is suggested.

### 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) | – |

### IV. College Distribution (CD) Requirements:

(In addition to and distinct from ACE)

|                                          |        |
|------------------------------------------|--------|
| 1. Written Communication                 | 3      |
| 2. Math and Science (all in major)       | –      |
| 3. Humanities/History                    |        |
| – Department 1                           | 3      |
| – Department 2                           | 3      |
| 4. Social Sciences                       | 3      |
| 5. Foreign Language (101, 102, 201, 202) | 0-16 * |

\* Must complete 2 semesters of 200 level **or** 4 years high school **or** have English as a second language.

**Total hours for graduation:** 125, of which typically 73 are in the major, 4 in the Math minor, and 33–49 in the General Studies (ACE and CD), leaving 0–15 as pure electives.

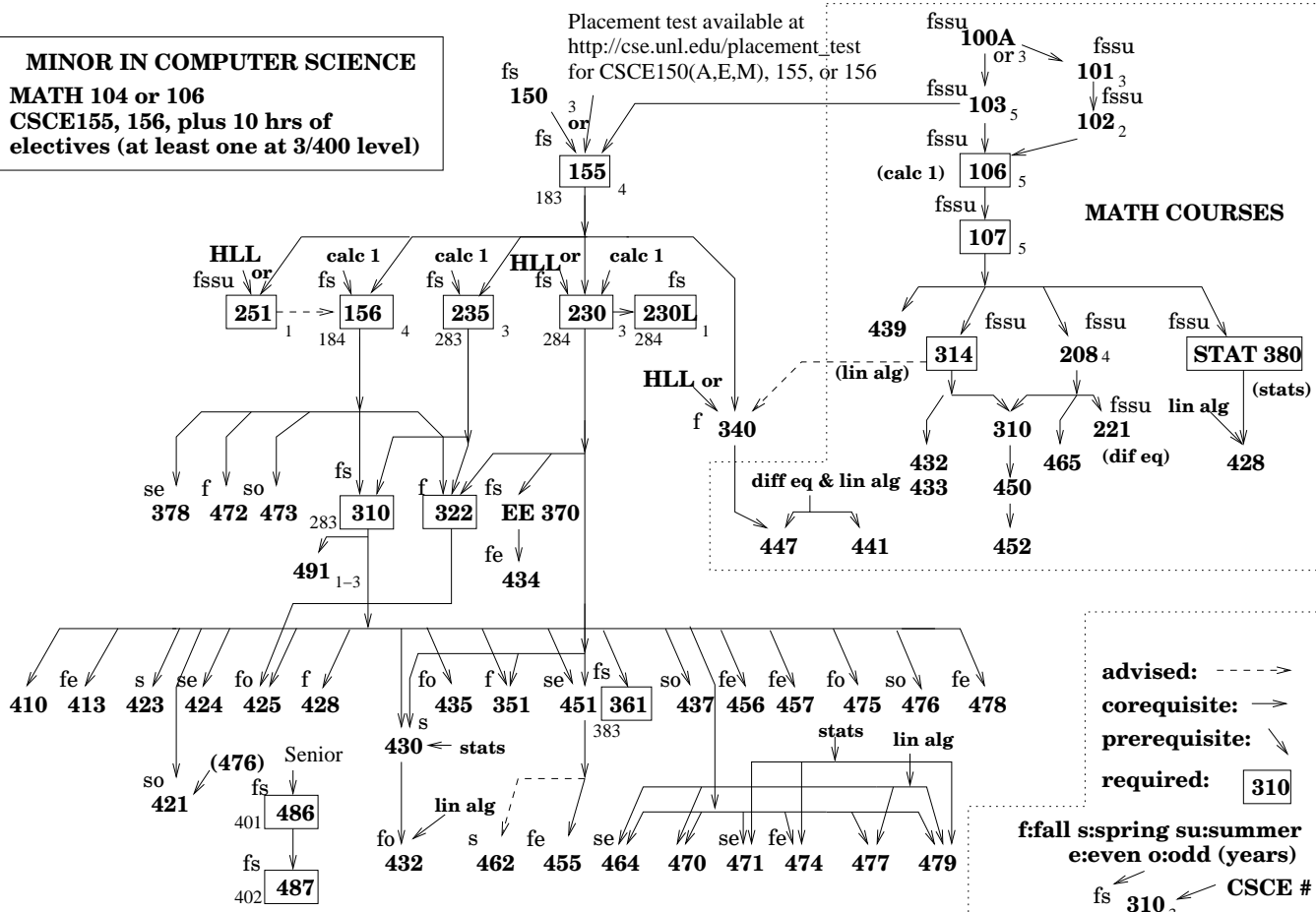
## Example Eight Semester Schedule - 125 hrs

|               |       |            |    |  |                 |       |            |    |
|---------------|-------|------------|----|--|-----------------|-------|------------|----|
| <b>Fall 1</b> |       |            |    |  | <b>Spring 1</b> |       |            |    |
| CSCE          | 155   | CS I       | 4  |  | CSCE            | 156   | CS II      | 4  |
| MATH          | 106   | Calc I     | 5  |  | CSCE            | 235   | Discrete   | 3  |
|               |       | ACE 1      | 3  |  | CSCE            | 251   | Unix       | 1  |
| Lang          | 201   | Language   | 3  |  | MATH            | 107   | Calc II    | 5  |
|               |       |            | 15 |  | Lang            | 202   | Language   | 3  |
|               |       |            |    |  |                 |       |            | 16 |
| <b>Fall 2</b> |       |            |    |  | <b>Spring 2</b> |       |            |    |
| CSCE          | 230   | Comp Org   | 3  |  | CSCE            | 310   | Algos      | 3  |
| CSCE          | 230L  | Lab        | 1  |  | STAT            | 380   | Stats      | 3  |
| Elect         |       | MATH 208?  | 4  |  | MATH            | 314   | Lin Alg    | 3  |
| NatSci        |       | (with lab) | 4  |  | NatSci          |       | (with lab) | 4  |
|               |       | ACE 2      | 3  |  |                 |       | CD 1       | 3  |
|               |       |            | 15 |  |                 |       |            | 16 |
| <b>Fall 3</b> |       |            |    |  | <b>Spring 3</b> |       |            |    |
| CSCE          | 322   | Lang Conc  | 3  |  | CSCE            | 3/4XX | elective   | 3  |
| CSCE          | 361   | Soft Engr  | 3  |  | CSCE            | 3/4XX | elective   | 3  |
| NatSci        |       |            | 4  |  |                 |       | CD 3 (1st) | 3  |
|               |       | ACE 5      | 3  |  |                 |       | CD 3 (2nd) | 3  |
|               |       | ACE 6      | 3  |  |                 |       | CD 4       | 3  |
|               |       |            | 16 |  |                 |       |            | 15 |
| <b>Fall 4</b> |       |            |    |  | <b>Spring 4</b> |       |            |    |
| 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    | 2  |  |                 |       | ACE 9      | 3  |
|               |       | ACE 7      | 3  |  | Elect           |       | (focus?)   | 3  |
| Elect         |       | (focus?)   | 3  |  | Elect           |       | (open?)    | 3  |
| Elect         |       | (focus?)   | 3  |  |                 |       |            | 15 |
|               |       |            | 17 |  |                 |       |            |    |

For assistance with general college requirements, contact the  
*Arts & Sciences Advising Center*, 107 Oldfather Hall, 472-4190,  
<http://ascweb.unl.edu/advise.html>

**MINOR IN COMPUTER SCIENCE**  
**MATH 104 or 106**  
**CSCE155, 156, plus 10 hrs of**  
**electives (at least one at 3/400 level)**

Placement test available at  
[http://cse.unl.edu/placement\\_test](http://cse.unl.edu/placement_test)  
 for CSCE150(A,E,M), 155, or 156



advised: - - - ->  
 corequisite: ->  
 prerequisite: >  
 required: [310]

f:fall s:spring su:summer  
 e:even o:odd (years)  
 fs 310 ← CSCE #  
 Raik # → 283 3 ← hours

HLL: any High Level Language

**COMPUTER SCIENCE PROGRAM**  
**Computer Science & Engineering**  
**and Supporting Courses**