CSCE Undergraduate Advising Handbook 2015-2016

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UNIVERSITY OF ARKANSAS

Contents

CSCE Department Information

CSCE Majors:

The department offers the following undergraduate degrees:

- Bachelor of Science in Computer Engineering
- Bachelor of Science in Computer Science
- Bachelor of Arts in Computer Science

Computer Engineering – Bachelor of Science

Computer Engineers engage in the design of embedded systems such as cell phones, avionics, communications networks, and digital radios, through Internet computing systems such as set top gaming boxes, and to more general purpose systems such as desktop and laptop computers, and next generation supercomputers. The Bachelor of Science in Computer Engineering provides a solid foundation in topics across the hardware-software boundary ranging from physical component structures to operating systems and programming languages to provide students with the ability to integrate physical and abstract components into working systems. Computer Engineering graduates find employment nationally with companies such as Intel, Lockheed Martin, and regionally with companies such as Texas Instruments and McDonnell Douglas.

Computer Science – Bachelor of Science

Computer Scientists seek approaches and methods to efficiently automate every day jobs, create and interpret new information, and seek new applications for technology to enhance the human experience. The Bachelor of Science in Computer Science prepares students through a solid core of study in the theoretical foundations of information and computation, as well as the practical techniques for implementing applications in a wide variety of computer systems. The Computer Science degree provides the flexibility to allow students to combine their skills with a wide variety of interdisciplinary interests in other fields, such as computational biology, chemistry, and art. Computer Science graduates find employment with national companies such as Google, Microsoft, and Amazon, and with regional companies such as Acxiom, ConocoPhillips, J.B. Hunt and Wal-Mart.

Computer Science – Bachelor of Arts

The Bachelor of Arts in Computer Science combines a solid core of Computer Science courses with the ability to gain knowledge in other subjects. In addition, there are numerous choices in the curriculum for science and humanities courses. Since computing is a discipline with strong links to many fields, this provides students with unparalleled flexibility to pursue other interests.

Changing Majors:

Students wanting to switch from CS to CE or CE to CS should discuss this first with their faculty advisor. The first two semesters of study are identical, so the transfer at that point is easy. There are minor differences in the third and fourth semester that still allow for change. After the fifth and sixth semester there are differences that might create some issues (such as having to take more coursework).

Completion of the forms to process the change of major should be done in the Academic Student Office in Bell Engineering room 3189.

Freshman Engineering

The Freshman Engineering Program was developed to help incoming freshmen decide on engineering majors, develop and practice good study habits and, in general, prepare the incoming students for the rigors of college and the university program. All freshmen entering the College of Engineering must enroll in the Freshman Engineering Program.

Transfer Students

Transfer students may be directed to Freshman Engineering if participation in the program would enhance progress towards their degree. However, transfer students with 24 credit hours or more are not required to enter the Freshman Engineering Program. The two courses that are required for FEP (GNEG 1111 and GNEG 1121) would be replaced with two hours of free electives.

Degree Requirement Information

CSCE Honors Program

Admission requirements for the Honors Program are as follows: entering freshman must have at least a 3.5 high school GPA and at least 28 composite score on the ACT; entering transfer students must have a 3.25 GPA on their transfer work. Students who do not qualify initially for the Honors Program are eligible after one year if they earn at least a 3.25 GPA.

Application for the Honors Program must be made through the Academic Dean's office in Bell 3189.

The department considers the following requirements necessary to graduate with honors:

- The candidate must satisfy the requirements set forth by the College of Engineering.
- A student must obtain at least a 3.5 grade-point average in required Computer Engineering and/or Computer Science courses.
- The student must complete a total of 12 hours of honors credit. Six hours of Honors credit must be in the major, including 3 hours of Honors Thesis taken as two successive semesters of CSCE 491VH and 3 hours of non-thesis class work (courses with honors designation or 5000 level).

Guidelines for completion of the honors program and required forms for submission of thesis and verification for degree completion can be found on the College of Engineering website.

Degree Program Changes:

Students must meet all requirements of their degree program and are expected to keep informed concerning current regulations, policies, and program requirements in their field of study. It is the responsibility of the student to ensure all degree requirements are met before graduation.

Changes made in curriculum at a level beyond that at which a student is enrolled **may become graduation requirements**. Changes made in the curriculum at a lower level than the one at which a student is enrolled are not required for that student. Students should consult their faculty advisor for additional information.

Students reinstated after a period of absence without continuous enrollment must meet the curriculum requirements of the catalog in effect at the time of reinstatement.

CSCE Electives

The B.S. degrees in both computer engineering and computer science require **four** CSCE Electives. Both degrees require the electives be chosen from any CSCE 4000+ course not required for the degree except for CSCE 490V, Individual Study. In addition, ***Computer Engineering*** students can choose to take ELEG 3923 Microprocessor System Design to count towards the CSCE Elective requirement.

Computer Engineering – may take ***one*** STEM elective from the following list for a CSCE Elective:

STEM Elective
MATH 4363 Numerical Analysis
MATH 4353 Numerical Linear Algebra
MATH 4253 Symbolic Logic I
MATH 4163 Dynamic Models in Biology
MEEG 4253 Introduction to Robotics
GEOS 4413 Principles of Remote Sensing
GEOS 4523 Computer Mapping
GEOS 4553 Introduction to Raster GIS
GEOS 4583 Vector GIS
GEOS 4593 Introduction to Global Positioning Systems
GEOS 4653 Advanced Raster GIS
INEG 4343 Cognitive Ergonomics
INEG 4563 Application of Robotics
BIOL 4233H Honors Genomics and Bioinformatics

Computer Science - may take **one** of the Professional electives listed below **OR one** of the Stem electives listed above for a CSCE Elective:

Professional elective
GNEG 4103 Globalization and Innovation
ISYS 4453 Introduction to Enterprise Servers
ISYS 4463 Enterprise Transaction Systems
MGMT 3933 Entrepreneurship and New Venture Development
MGMT 4253 Leadership
MGMT 4433 Small Enterprise Management
MGMT 4993 Entrepreneurship Practicum

If a student wishes to take a STEM or Professional elective not on the approved list, the student must petition the Undergraduate Curriculum Committee for approval ***prior*** to enrolling in the class. The petition form must be submitted electronically with supporting documents to srh@uark.edu.

Computer Science B.A. students can choose from any CSCE 3000-level+ course not required for the degree with the exception of CSCE 490V.

Humanities/Social Science Electives

All students at the University of Arkansas-Fayetteville are required to meet the University Core (State Minimum Core). If the core is not met, it will affect graduation.

All **CE and CS** (B.S. and B.A.) students are required to take:

A) 3 hours of Fine Arts from the following courses:

Fine Arts – ARCH 1003, ARHS 1003, COMM 1003, DANC 1003, DRAM 1003, LARC 1003, MLIT 1003

B) 3 hours of humanities - PHIL 3103 Ethics and the Professions (required course)

- **3 hours** U.S. History or Government

  Choose one of the following:
  HIST 2003, HIST 2013, PLSC 2003

- **9 hours** of Social Science

  Courses must be taken from at *least two different* departments:
  AGEC 1103, AGEC 2103
  ANTH 1023
  ECON 2013, ECON 2023, ECON 2143
  GEOG 1123, GEOG 2003
  HESC 1403, HESC 2413
  HIST 1113, HIST 1123, HIST 2003*, HIST 2013*
  HUMN 1114H, HUMN 2114H
  PLSC 2003*, PLSC 2013, PLSC 2203
  PSYC 2003
  RESM 2853
  RSOC 2603
  SOCI 2013, SOCI 2033
  **If not selected to meet the History/Government elective*

Academic Advising:

Students are assigned a CSCE faculty advisor their first semester of enrollment in a CSCE program. Typically, this advisor will remain with the student throughout their academic career. Students

can find the name of their faculty advisor in the ISIS system in their student account or by contacting the CSCE Department.

How Advising Works:

Priority registrations are held in the fall and spring semesters, allowing a currently enrolled student to register for classes prior to new students entering the university. Students are ***strongly encouraged*** to register during these periods because certain classes tend to fill up quickly and seating may be limited or low enrollments could mean that classes get cancelled.

Students must see their advisor prior to any registration period to review the degree check, course plans, answer questions, and get assistance with academic problems. Advising periods are scheduled two weeks before Priority Registration begins.

How to Get Advised:

Step 1:
Degree checks can be obtained from the faculty advisor to assist in planning future courses. Students have access to degree audits in ISIS through their student account.

Step 2:
Schedule an appointment with your faculty advisor during their advertised times. Advisors will contact advisees about appointment periods. The advisor will review the course plan and verify that prerequisites have been met. Your faculty advisor will remove the advising hold at the end of your appointment.

This is also a good opportunity to talk about career plans, co-ops, and other academic issues.

Math Minor requirements:

MATH 2564 Calculus II and

MATH 2603 Discrete Mathematics or MATH 2803 Introduction to Mathematical Proof

Plus 3 courses selected from the following:

MATH 2574 Calculus III

MATH 2584 Differential Equations and Laplace Transform

Any MATH or STAT courses at the 3000-level or higher

For both CSCE B.S. degree programs:

If you take STAT 3013 for your statistics elective, you will qualify for a Math minor.

If you take INEG 2313, then taking a single 3000+ MATH class would qualify you for a Math minor.

To declare a Math minor, go to the College of Engineering Dean's office in Bell Engineering, room 3189 to complete the paperwork.

Additional Bachelor's Degree

A person with a bachelor's degree from the University of Arkansas, or from any other institution, may not receive another bachelor's degree without completing at least 30 hours of additional, not necessarily subsequent, courses selected from the courses leading to a degree for which the person is a candidate.

More than 30 hours of course work may be required. In addition to the college or school requirements, the candidate must also meet all university requirements as stated in the catalog, including graduation and core requirements.

Accelerated M.S. Degree

High-achieving undergraduate students in either the Computer Engineering or Computer Science B.S. program at the University of Arkansas who choose to pursue graduate studies in our department may participate in the accelerated MS program. Eligible students must have a GPA of 3.5 or above in their major.

They can take up to 6 credit hours of 5000-level CSCE courses as technical electives for their bachelor's degree and count those hours towards their graduate degree, should they choose to pursue one in our department. The 6 hours must be taken within the final 12 months before receiving the undergraduate degree.

CSCE B.S. Common Information

CSCE Basic Science Electives

Approved courses with lab - ASTR 2003/2001L Survey of the Universe; BIOL 1543/1541L Principles of Biology; ENSC 1003/1001L Environmental Science; GEOL 1113/1111L General Geology; BIOL 1603/1601 Principles of Zoology; BIOL 2213/2211L Human Physiology; CHEM 1133/1131L University Chemistry II for Engineers; PHYS 3613 Modern Physics

Free Electives

Free electives can be chosen from any area but cannot be remedial courses. Courses that will not count are ANTH 0003, PHSC 0003, ENGL 0003, MATH 0003, CIED 0003, MATH 1203, MATH 1213, and MATH 1285.

3.6 Computer Engineering and Computer Science B.S.

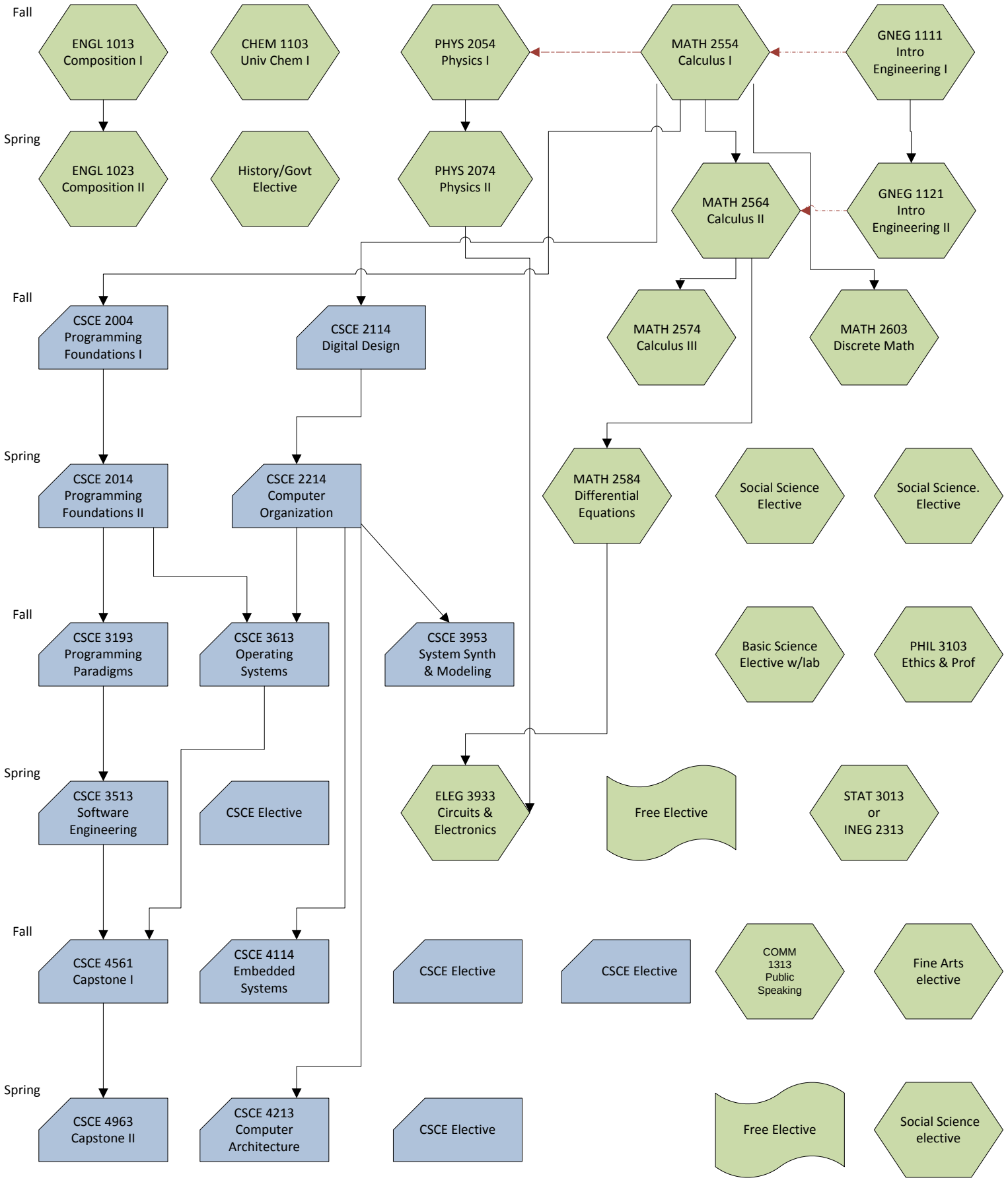
Computer Engineering 8 Semester Plan – 2015-2016

Fall Semester Year 1	**Spring Semester Year 1**
4 MATH 2554 Calculus I 3 CHEM 1103 University Chemistry I 4 PHYS 2054 University Physics I 1 GNEG 1111 Introduction to Engineering I 3 ENGL 1013 English Composition **15 Semester hours**	4 MATH 2564 Calculus II 4 PHYS 2074 University Physics II 3 History/Government elective 1 GNEG 1121 Introduction to Engineering II 3 ENGL 1023 Composition II **15 Semester hours**
Fall Semester Year 2	**Spring Semester Year 2**
4 MATH 2574 Calculus III 4 CSCE 2004 Programming Foundations I 4 CSCE 2114 Digital Design 3 MATH 2603 Discrete Math **15 Semester hours**	4 MATH 2584 Differential Equations 4 CSCE 2214 Computer Organization 4 CSCE 2014 Programming Foundations II 3 Social Science elective 3 Social Science elective **18 Semester hours**
Fall Semester Year 3	**Spring Semester Year 3**
3 CSCE 3613 Operating Systems 3 CSCE 3953 System Synthesis & Modeling 3 CSCE 3193 Programming Paradigms 3 PHIL 3103 Ethics & the Professions 4 Basic Science elective with lab **16 Semester hours**	3 CSCE 3513 Software Engineering 3 CSCE elective3 ELEG 3933 Circuits & Electronics 3 Free elective 3 STAT 3013 Introduction to Probability and Statistics or INEG 2313 Applied Probability and Statistics for Engineers I **15 Semester hours**
Fall Semester Year 4	**Spring Semester Year 4**
1 CSCE 4561 Capstone I 4 CSCE 4114 Embedded Systems 3 CSCE elective 3 CSCE elective 3 Fine Arts elective 3 COMM 1313 Public Speaking **17 Semester hours**	3 CSCE 4963 Capstone II 3 CSCE 4213 Computer Architecture 3 CSCE elective 3 Social Science elective 3 Free Elective **15 Semester hours**

126 Total hours

Computer Engineering – Bachelor of Science

Fall 2015



Computer Science 8 Semester Plan – 2015-2016

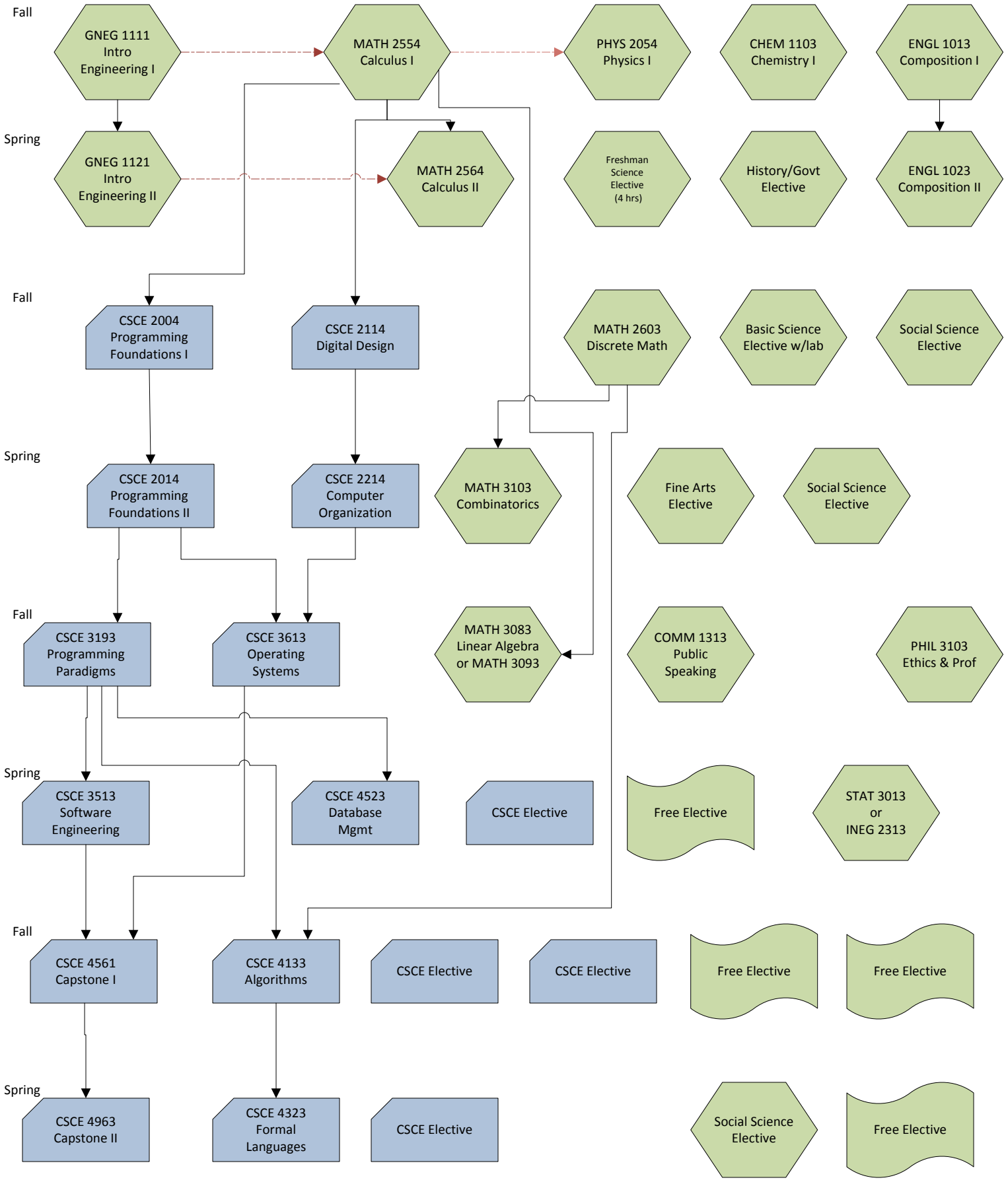
Fall Semester Year 1	**Spring Semester Year 1**
4 MATH 2554 Calculus I 3 CHEM 1103 University Chemistry I 4 PHYS 2054 University Physics I 1 GNEG 1111 Introduction to Engineering I 3 ENGL 1013 English Composition **15 Semester hours**	4 MATH 2564 Calculus II 4 Freshman Science elective* 1 GNEG 1121 Intro to Engineering II 3 ENGL 1023 Composition II 3 History/Government elective **15 Semester hours**
Fall Semester Year 2	**Spring Semester Year 2**
3 MATH 2603 Discrete Math 4 Basic Science elective with lab 4 CSCE 2004 Programming Foundations I 4 CSCE 2114 Digital Design 3 Social Science elective **18 Semester hours**	3 MATH 3103 Combinatorics 4 CSCE 2014 Programming Foundations II 4 CSCE 2214 Computer Organization 3 Fine Arts elective 3 Social science elective **17 Semester hours**
Fall Semester Year 3	**Spring Semester Year 3**
3 CSCE 3193 Programming Paradigms 3 CSCE 3613 Operating Systems 3 COMM 1313 Public Speaking 3 MATH 3083 Linear Algebra 3 PHIL 3103 Ethics & the Professions **15 Semester hours**	3 CSCE 4523 Database Management 3 CSCE 3513 Software Engineering 3 CSCE elective 3 Free elective 3 STAT 3013 Intro to Probability and Statistics (INEG 2313 can be substituted) **15 Semester hours**
Fall Semester Year 4	**Spring Semester Year 4**
1 CSCE 4561 Capstone I 3 CSCE 4133 Algorithms 3 CSCE elective 3 CSCE elective 3 Free elective 3 Free elective **16 Semester hours**	3 CSCE 4963 Capstone II 3 CSCE elective 3 CSCE 4323 Formal Languages 3 Free elective 3 Social Science elective **15 Semester hours**

126 Total hours

* Choose between PHYS 2074 University Physics II or CHEM 1133/1131L University Chemistry II for Engineers and lab.

Computer Science – Bachelor of Science

Fall 2015



3.7 Computer Science B.A.

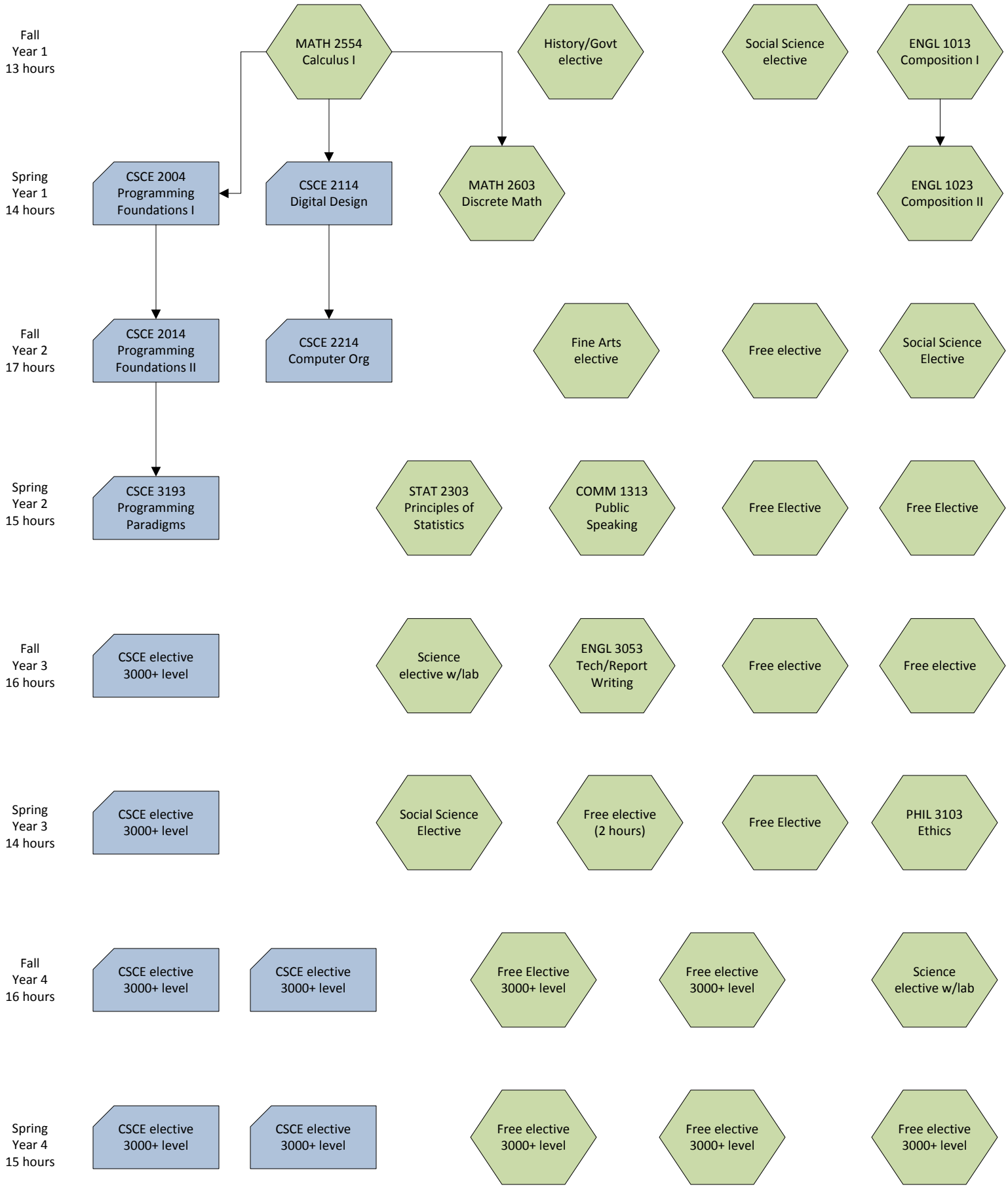
Computer Science BA 8 Semester Plan – 2015-2016

Fall Semester Year 1	**Spring Semester Year 1**
3 ENGL 1013 Composition I 4 MATH 2554 Calculus I 3 HIST 2003 or HIST 2013 or PLSC 2003 3 Social science elective **13 Semester hours**	4 CSCE 2004 Programming Foundations I 4 CSCE 2114 Digital Design 3 MATH 2603 Discrete Mathematics 3 ENGL 1023 Technical Composition II **14 Semester hours**
Fall Semester Year 2	**Spring Semester Year 2**
4 CSCE 2014 Programming Foundations II 4 CSCE 2214 Computer Organization 3 Fine Arts elective (from University core) 3 Social Science elective (from University core) 3 Free Electives **17 Semester hours**	3 CSCE 3193 Programming Paradigms 3 STAT 2303 Principles of Statistics 3 COMM 1313 Public Speaking 3 Free Electives 3 Free Electives **15 Semester hours**
Fall Semester Year 3	**Spring Semester Year 3**
3 CSCE elective (3000-level or higher) 3 ENGL 3053 Tech/Report Writing 4 Science elective with lab 3 Free Electives 3 Free Electives **16 Semester hours**	3 CSCE elective (3000-level or higher) 3 PHIL 3103 Ethics and the Profession 5 Free Elective 3 Social Science elective (from University core) **14 Semester hours**
Fall Semester Year 4	**Spring Semester Year 4**
3 CSCE Elective (3000-level or higher) 3 CSCE Elective (3000-level or higher) 4 Science elective 3 Free elective (3000-level or higher) **16 Semester hours**	3 CSCE elective (3000-level or higher) 3 CSCE elective (3000-level or higher) 3 Free Elective (3000-level or higher) 3 Free elective (3000-level or higher) 3 Free elective (3000-level or higher) **15 Semester hours**

120 Total hours

Computer Science – Bachelor of Arts

Fall 2015



Graduation Requirements

In addition to the specific departmental requirements for degree plans, students should refer to the Academic Regulations section of the Catalog of Studies for general university requirements.

The College of Engineering has these additional requirements.

1. **Grade-Point Average** – A candidate for a degree from the College of Engineering must have earned a grade-point average of no less than 2.00 on all courses in the student's major area of study.

2. **Courses That Do Not Count Toward a Degree** – The following courses, which may be required, do not count toward degree credit for Bachelor of Science or the Bachelor of Arts degrees in the College of Engineering: ENGL 002, ENGL 0013, MATH 0003, MATH 1203, MATH 1213, MATH 1284, and GNEG 1514.

3. **"D" Rule** – No students will be allowed to graduate if the student has "D" grades in more than 8 hours presented to meet the requirements for a degree.

4. **Transfer of Courses** – Advanced (3000- and 4000-level at the University of Arkansas) engineering courses may not normally be transferred from institutions that do not have programs accredited by the Engineering Accreditation Commission.

5. **Resident Requirements** – A candidate must earn a minimum of 20 credit hours at the 3000-level and above in the College of Engineering from the University of Arkansas.

Application for Graduation

Students who plan to graduate must file an official application to do so. Applications should be filed for the term in which degree requirements will be completed. A graduation fee will be required at the time of application.

To ensure that students will be certified for graduation in a timely manner, the following graduation application deadlines have been established:

Date	Description
October 1	for students graduating in Fall
March 1	for students graduating in Spring
July 1	for students graduating in Summer

Students must apply by the established deadline for that term. A student who fails to complete the degree during the intended semester must contact the Office of the Registrar to renew the application for the term in which the degree requirements will be completed.