

**DEPARTMENT OF COMPUTER SCIENCE
UNIVERSITY OF ILLINOIS AT CHICAGO**

Requirements for BS in CS w/ Human-Centered Computing Concentration – Total 128 credit hours

Non-engineering and General Education Requirements (57 Credit hours)

<u>Course #</u>	<u>Hours</u>	<u>Course Title</u>	<u>Pre-Requisites</u>
ENGL 160	3	Academic Writing I	Satisfactory performance on dept. placement test
ENGL 161	3	Academic Writing II	ENGL 160 or the equivalent
MATH 180	4	Calculus I	'C' or better in MATH 121 or appropriate performance on the dept. placement test
MATH 181	4	Calculus II	'C' or better in MATH 180
MATH 210	3	Calculus III	'C' or better in MATH 181
MATH 220	3	Differential Equations	'C' or better in MATH 210
PHYS 141	4	General Physics I (Mechanics)	'C' or better in MATH 180
PHYS 142	4	General Physics II (Electricity and Magnetism)	'C' or better in MATH 181 and PHYS 141
EWC	3	Exploring World Cultures course	See General Education section for approved list
UCA	3	Understanding the Creative Arts course	See General Education section for approved list
UP	3	Understanding the Past	See General Education section for approved list
UIS	3	Understanding the Individual Society	See General Education section for approved list
UUS	3	Understanding the U.S. Society course	See General Education section for approved list
H/SS/A	12	Humanities / Social Sciences / Art Electives	Must select from list approved by CS dept.: see below
SE	2	Science Electives	See below for details

Required Courses in CS & COE (51 Credit hours)

<u>Course #</u>	<u>Hours</u>	<u>Course Title</u>	<u>Pre-Requisites</u>
ENGR 100	0	Engineering Orientation	Admission to the College of Engineering
CS 111	3	Program Design I	None
CS 141	3	Program Design II	CS 109 or CS 111; and credit or concurrent registration in MATH 180
CS 151	3	Mathematical Foundations of Computation	MATH 180; and 'C' or better in CS 111
CS 211	2	Programming Practicum	'C' or better in CS 141
CS 251	4	Data Structures	CS 151 or CS 201; and credit or concurrent registration in CS 211
CS 261	3	Machine Organization	Credit/concurrent registration in CS 211
CS 301	3	Languages and Automata	'C' or better in CS 151 or 201; and credit or concurrent registration in CS 251
CS 341	3	Programming Language Design and Implementation	CS 251 and CS 261; or approval of the department
CS 342	3	Software Design	CS 251
CS 361	3	Computer Systems	CS 251 and CS 261
CS 362	3	Computer Design	CS 261
CS 377	3	Communication and Ethical Issues in Computing	CS 251
CS 401	3	Computer Algorithms I	'C' or better in CS 251 or MCS 360
CS 422	3	User Interface Design and Programming	CS 342
CS 499	0	Professional Development Seminar	Senior & in last semester of study
Selectives	9	At least three of the following 3 hour courses – remainder can be chosen to satisfy technical electives	
CS 411	3	Artificial Intelligence I	CS 251
CS 415 or ECE 415	3	Computer Vision I Image Analysis and Computer Vision I	CS 251 or MCS 360 MATH 310; or "C" or better in ECE 310
CS 421	3	Natural Language Processing	CS 301 or MCS 441
CS 424	3	Visualization and Visual Analytics	CS 251; or consent of the instructor
CS 425	3	Computer Graphics I	CS 251
CS 426	3	Video Game Design and Development	CS 251; or consent of the instructor

Technical Electives (6 Credit hours)

<u>Course #</u>	<u>Hours</u>	<u>Course Title</u>	<u>Pre-Requisites</u>
CS 385/461	3	Operating Systems Concepts and Design	CS 361; or CS 201 & ECE 267
CS 398	3	Undergraduate Design/Research	Consent of the instructor
CS 412	3	Introduction to Machine Learning	CS 251; & IE 342 / STAT 381; or consent of instructor
CS 440	3	Software Engineering I	CS 342
CS 441	3	Distributed Object Programming Using Middleware	'C' or better in ((CS 341 or 342) and CS 361)
CS 450	3	Introduction to Networking	CS 361

CS 455	3	Design and Implementation of Network Protocols	CS 342 and CS 450
CS 466	3	Advanced Computer Architecture	CS 361 or ECE 366
CS 469	3	Computer Systems Design	CS 361; or ECE (366 & 368)
CS 473	3	Compiler Design	'C' or better in ((CS 301 or MCS 441) and (CS 251 or MCS 360) and (CS 261))
CS 474	3	Object-Oriented Languages and Environments	CS 342
CS 476	3	Programming Language Design	CS 341 or MCS 360
CS 477	3	Public Policy, Legal, & Ethical Issues in Computing, Privacy and Security	Consent of the instructor
CS 478	3	Software Development for Mobile Platforms	CS 342
CS 480	3	Database Systems	CS 251
CS 485	4	Networked Operating Systems Programming	CS 385
CS 486	3	Secure Operating System Design and Implementation	Credit / concurrent registration in CS 385 and 450; or consent of instructor
CS 487	3	Building Secure Computer Systems	'C' or better in CS 385 and senior standing; or consent of the instructor
CS 489	3	Human Augmentics	Senior standing; or consent of instructor
ECE 452	3	Robotics: Algorithms and Control	CS 201; and "C" or better in ECE (210 or 225)
MCS 320	3	Introduction to Symbolic Computation	'C' or better in ((MATH 210) and (MCS 260 or CS 107 or CS 109))
MCS 471	3	Numerical Analysis	'C' or better in (MCS 275 or CS 107 or CS 109); or consent of the instructor
MCS 481	3	Computational Geometry	'C' or better in CS/MCS 401 or cons. of instructor
STAT 471	3	Linear and Non-Linear Programming	'C' or better in MATH 310
MATH 419	3	Models in Applied Mathematics	'C' or better in (MATH 220 or MCS 260)

Required Mathematics courses (6 credit hours)

<u>Course #</u>	<u>Hours</u>	<u>Course Title</u>	<u>Pre-Requisites</u>
IE 342* or STAT 381	3	Probability and Statistics for Engineers Applied Statistical Methods	MATH 181 'C' or better in MATH 210; or approval of department
MATH 310 or MATH 320	3	Applied Linear Algebra Linear Algebra I	'C' or better in MATH 210 Concurrent registration in MATH 215

*Students who receive credit in IE 342 will not receive credit for either STAT 381 or STAT 401

Humanities / Social Science / Arts Electives (Must complete 12 credit hours total. DARS sometimes does not automatically recognize these classes, in those cases submit a petition in the college office SEO 123)

The HCC concentration **requires** at least **three** courses selected from the **following list**: PSCH 100, PSCH 242, ART 150, ART 454, ART 456, DES 452, COMM 316, COMM 430 and COMM 460 (to enroll in these courses students will have to go to the respective departments to get an override on pre-requisites/courses). Additional courses can come from the list or

- (i). Any of the courses contained in the EWC, UCA, UP, UIS and /or UUSS general education requirement course lists. (ii) Any course for which either a course in (1) or English 161 is a prerequisite. (iii) All courses in foreign languages; and (iv) All courses in the College of Architecture and Art (with some exceptions).

Science Electives (2 hours). Every student must take a total of at least 2 additional credit hours in the science area to make up a total of 10 credits. Additional courses may be other courses on this list, courses that have PHYS 141, PHYS 142, or any of these courses as prerequisites, or other courses from a list maintained by the Department of Computer Science of certain additional courses in Engineering and quantitative social sciences.

<u>Course #</u>	<u>Hrs</u>	<u>Course Title</u>	<u>Course #</u>	<u>Hours</u>	<u>Course Title</u>
CHEM 122 & 123 or CHEM 116	5	General College Chemistry I Honors General College Chemistry I	BIOS 100 BIOS 101	5 5	Biology of Cells and Organisms
CHEM 124 & 125 or CHEM 118	5 5	General College Chemistry II Honors General College Chemistry II	EAES 101 EAES 111	4 4	Global Environmental Change Earth, Energy and the Environment

Free Electives (8 credit hours)