COMPUTER AND COGNITIVE SCIENCE, BAS

The BAS in Computer and Cognitive Science through the School of Engineering and Applied Science combines the application of theoretical insights from Computer Science, Linguistics, Neuroscience, Philosophy, and Psychology to the formal study of intelligence, perception, reasoning, and other properties of mind, and their application in the service of Information Technology. The degree combines a form grounding in relevant aspects of Computer Science, from programming to algorithms to artificial intelligence, with a concentration in specific courses from the contingent disciplines. The non-computer science courses have been selected for formal rigor and scientific relevance. The degree prepares students for a wide variety of careers in a number of distinct academic, industrial, and professional arenas relating to psychology, philosophy and linguistics. In particular, these careers pertain to the impact of knowledge and information technology on the professions, including those in Media and Communications, Software Development, and Education (among many others), in which a broad background in computer science must be combined with a deep understanding of the human mind. The BAS in Computer and Cognitive Science is intended to address the need for properly trained computer scientists who have sufficient understanding of these other disciplines to be able to solve the many open problems in applications, research, and development that must be addressed if we are to realize the full potential of information processing technologies in these domains. Employment opportunities for students going through such a program are excellent at major information technology companies, software houses, and research labs, as well as in the standard career structures in the areas identified above.

For more information: https://www.seas.upenn.edu/prospective-students/undergrad/majors/bachelor-of-applied-science/

Computer and Cognitive Science (ASCC) Major Requirements

40 course units are required. Read more about the Undergraduate Student Handbook (http://www.seas.upenn.edu/undergraduate/handbook).

Code	Title	Course Units
Engineering		
CIS 110	Introduction to Computer Programming	1
CIS 120	Programming Languages and Techniques I	1
CIS 121	Programming Languages and Techniques II	1
CIS 140	Introduction to Cognitive Science	1
CIS 240	Introduction to Computer Systems	1
CIS 320	Introduction to Algorithms	1
CIS 421	Artificial Integlligence	1
CIS Elective [1]		2
Engineering Electives		2
EAS 499	Senior Capstone Project	1
Math		
MATH 104	Calculus, Part I	1
MATH 114	Calculus, Part II	1
CIS 160	Mathematical Foundations of Computer Science	1
CIS 262	Automata, Computability, and Complexity	1
Math Elective		2
Natural Science		
PHYS 140	Principles of Physics I (without laboratory)	1
PHYS 141	Principles of Physics II (without laboratory)	1
Natural Science [2]		2
Concentration		
Select 8 course units		8
Social Sciences and Humanities [3]		
EAS 203	Engineering Ethics	1
Select 2 Social Science courses		2
Select 2 Humanities courses		2
Select 2 Social Science or Humanities or Technology in Business & Society courses		2
Free Elective		
Select 3 course units of free electives		3
Total Course Units		40

1. A CIS elective is a CIS or NETS engineering course. The SEAS handbook defines all CIS and NETS classes numbered 1xx-5xx as engineering courses, with the following exceptions that **cannot** be used: CIS 105 Computational Data Exploration, CIS 106 Visualizing the Past., CIS 125 Technology and Policy, CIS 160 Mathematical Foundations of Computer Science, CIS 261 Discrete Probability, Stochastic Processes, and Statistical Inference, CIS 262 Automata, Computability, and Complexity.
   ESE 350 Embedded Systems/Microcontroller Laboratory can also be used to satisfy the CIS elective requirement.
   Please note: Students may count at most 1 cu of 1xx credit as a CIS Elective.
2. Science labs are not required. Labs taken can be used as Natural Science credit.
3. The Social Science & Humanities Depth, Writing & Ethics Requirement can be satisfied with the 7 total course units.

Concentration

Department approval is required.

- Option 1: Any approved minor, or sequence of approved courses. Remaining must be Math, Natural Science or Engineering. (Minors are strongly encouraged.)
- Option 2: Any 8 course units from Math, Natural Science, Engineering, or from the following specified tech electives:

Code	Title	Course Units
LING 106	Introduction to Formal Linguistics	1
PHIL 231	Epistemology	1
PHIL 244	Introduction to Philosophy of Mind	1
OIDD 220	Introduction to Operations Management	1
OIDD 321	Introduction to Management Science	1
OIDD 325	Computer Simulation Models	1

For ASCC Majors, Nat Sci may also include the following Cog Sci Courses:

Code	Title	Course Units
LING 230	Sound Structure of Language	1
LING 250	Introduction to Syntax	1
LING 520	Phonetics I	1
LING 530	Phonology I	1
LING 531	Phonology II	1
LING 550	Syntax I	1
LING 551	Syntax II	1
LING 603	Topics in Phonology	1
LING 630	Seminar in Morphology	1
PSYC 109	Introduction to Brain and Behavior	1
PSYC 111	Perception	1
PSYC 151	Language and Thought	1

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2018 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.