In the Cognitive Science in Education Program, students examine the cognitive mechanisms that underlie learning and thinking in school and non-school settings. The program trains students in basic theories of human cognition, the practice and interpretation of empirical cognitive and developmental research, as well as how to use research to improve educational practices and develop innovative methods built around new technologies. Studies in cognitive, developmental and educational psychology, and computer science provide students with a valuable perspective on cognition and learning.

The curriculum and program requirements are designed to prepare graduates for careers in several possible settings. For the Master's program, these settings include:

- school systems seeking instructional technology coordinators and teachers who are knowledgeable about cognitive and developmental theories and research.
- publishers and software companies looking for people with knowledge of cognition and development, and experience in instructional design.
- research organizations seeking people to conduct basic research and work on instructional applications of computers and related technologies.

Students in the Cognitive Science in Education Program begin by taking a set of core background courses, then pursue one of eight areas of focus: Cognition and Learning, Intelligent Technologies, Reading Research, Cognitive Science of Educational Practice, Children’s Media, Creativity and Cognition, eLearning in the Workplace, or Learning Analytics.

In addition, each student registers for research practicum seminars during which they complete a substantive project as a culminating experience for that degree. Choice of advanced courses and research seminars should be shaped by the student's area of focus, as described below. Students whose interests do not fit one of these tracks may design their own area of focus, in consultation with their advisor.
Program Requirements

Master of Arts: 32 points

Core Courses (9 points):
All three courses are required

- HUDK 4029 Human cognition and learning (3)
- HUDK 4080 Educational psychology (3)
- HUDK 5023 Cognitive development (3)

Statistics/Research Design (3 points):
At least one of the following:

- HUDM 4120 Basic concepts in statistics (3)
- HUDM 4122 Probability and statistical inference (3)
- HUDM 5122 Applied regression analysis (3)
- HUDM 5123 Linear models and experimental design (3)

Research Practicum (3 points):

- HUDK 5324 Research work practicum (3) by permission,

(The Integrative Project is done in conjunction with these courses)

Specialized Courses (8-11 points):
Selected in consultation with an advisor and focusing on one of the following areas of focus:

Cognition and Learning:

- HUDK 4015 Psychology of thinking (3)
- HUDK 4027 Development of mathematical thinking (3)
- HUDK 5024 Language development (2-3)
- HUDK 5025 Spatial thinking (3)
- HUDK 5030 Visual explanations (3)
- HUDM 5058 Choice and decision making (3)
- HBSK 5096 Psychology of memory (3)
- HUDK 5042 Motivation in education (3)
- HUDK 5063 Cognitive development beyond childhood (3)

Intelligent Technologies:

- HUDK 4015 Psychology of thinking (3)
- HUDK 4035 Technology and human development (3)
- HUDK 5025 Spatial thinking (3)
- HUDK 5030 Visual explanations (3)
- HUDK 5035 Psychology of media (3)
- HUDK 5042 Motivation in education (3)
- HUDK 5197 Psychology of eLearning in business and industry (3)
• HUDK 4050 Core methods in educational data mining (3)
• HUDK 4051 Learning analytics: Process and theory (3)
• HUDK 5037 Psychology of children’s television (3)
• HUDK 5063 Cognitive development beyond childhood (3)

Reading Research:

• HUDK 4015 Psychology of thinking (3)
• HUDK 5024 Language development (3)
• HUDK 5035 Psychology of media (3)
• HUDK 5042 Motivation in education (3)
• HUDK 5063 Cognitive development beyond childhood (3)
• HUDK 5090 Psychology of language and reading (3)
• HBSK 4074 Development of reading comprehension strategies and study skills (3)

Cognitive Science in Educational Practice:

• HUDK 4015 Psychology of thinking (3)
• EDPS 4021 Sociology of education (3)
• HUDK 4035 Technology and human development (3)
• HBSK 4074 Reading comprehension strategies and study skills (3)
• HUDK 5042 Motivation in education (3)
• HUDK 5063 Cognitive development beyond childhood (3)
• ORL 5522 Evaluation methods I (3)

Learning Analytics:

• HUDK 4050 Core methods in educational data mining (3)
• HUDK 4051 Learning analytics: process and theory (3)
• HUDK 4052 Data, Learning, and Society (3) or HUDK4011 Networked and Online Learning (3)
• HUDK 5053 Feature engineering studio (3)
• HUDK 4054 Managing education data (3)

Children’s Media:

• HUDK 4015 Psychology of thinking (2-3)
• HUDK 4021 Developmental psychology – infancy (2-3)
• HUDK 4022 Developmental psychology – childhood (2-3)
• HUDK 4023 Developmental psychology – adolescence (2-3)
• HUDK 4025 Cognition of handheld devices (3)
• HUDK 4029 Cognition and learning (3)
• HUDK 4035 Technology and human development (2-3)
• HUDK 4040 Social media and users (3)
• HUDK 5035 Psychology of media (3)
• HUDK 5036 Psychology of children’s television (3)
• HUDK 5063 Cognitive development beyond childhood (3)
Creativity and Cognition:

- HUDK 5020 Development of creativity (3) (required for area of focus)
- HUDK 5025 Spatial thinking (3)
- HUDK 5029 Personality development and socialization across the lifespan (3)
- HUDK 5030 Visual explanations (3)
- HUDK 5120 Development of creativity: the case study method (3)
- HUDK 5125 Cross-cultural psychology (3)
- HUDK 5063 Cognitive development beyond childhood (3)

eLearning in the Workplace:

- HUDK 5197 Psychology of eLearning in Business and Industry (required for area of focus) (3)
- HUDK 4015 Psychology of thinking (3)
- MSTU 4039 Video games in education (3)
- MSTU 5000 Possibility of virtual worlds (3)
- HUDK 5030 Visual explanations (3)
- HUDK 5035 Psychology of media (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- ORLD 4015 How adults learn (3)
- ORLJ 4005 Organizational psychology (3)

Non-departmental Courses (minimum of 6 points):
At least 2 courses outside the department selected in consultation with an advisor.

Integrative Project: One of the following

1. Empirical Research Paper
2. Design (and perhaps Implementation) Project Paper
3. Research Literature Review Paper

Areas of Focus:

Area of focus in Cognition and Learning: The area of focus in Cognition and Learning is designed for students interested in theories of human cognition and learning, and experimental approaches to learning, memory, language, reasoning, and problem solving.

Area of focus in Intelligent Technologies: The Intelligent Technologies area of focus offers a program of study for students whose interests include developing cognitive science-based theoretical frameworks for informing the design of educational technology, as well as for students wishing to create educational applications that serve as test-beds for such theoretical frameworks. By offering this area of focus, the Program in Cognitive Science recognizes the importance of computational and allied technologies to both guide and be guided by cognitive research.

Area of focus in Reading Research: This area of focus prepares students to conduct basic research in reading, research and theory on all aspects of the psychology of reading (e.g. basic skills, comprehension and aesthetic response) in order to improve educational practice. Students address the connections between written and oral language, and between reading and writing skills. Individual differences are
also addressed, especially with respect to students with learning disabilities, adult literacy, learning from text and educational policy issues.

**Area of focus in Cognitive Science in Educational Practice:** This area of focus is for students interested in understanding and facilitating the thinking and learning involved in educational activities. Students will learn about cognitive processes involved in both formal and informal education and how they are influenced by various factors, including classroom structure, teacher belief systems, student motivation, and educational policy. The program's focus on understanding cognitive processes and development is designed to help prospective and practicing teachers, and other educators, improve educational practice.

**Area of focus in Creativity and Cognition:** This area of focus is for students who are interested in current ideas about the roles of creativity in cognition and human development affect how we teach, run organizations, conduct research and live our personal lives. This area of focus is offered in collaboration with the Program in Developmental Psychology.

**Area of focus in Children's Media:** This area of focus is for students interested in applying cognitive and developmental psychology research and theories to the development/production of educational media for children. Educational media is examined as wide ranging: print, television, hand-held devices, and internet based applications.

**Area of focus in Learning Analytics:** In this focus, students will learn key LA/EDM methodologies in technical detail, and how to apply them to real-world problems. Students will learn how to use LA and EDM algorithms and tools appropriately and effectively, and about relevant policy, legal, and ethical issues involved in conducting analytics on educational data. Studies will be integrated with understanding of key theories of cognition and education, preparing students to apply learning analytics methods to make a difference in education. The skills students learn will prepare them for a range of 21st-century jobs, including working for educational technology companies and startups, educational think-tanks, and in data groups at city and state departments of education. Coursework will involve real-world data in a range of educational domains and applications, while integrating world-class offerings in cognition, educational theory, and statistics and measurement. For additional information, please contact Professor Gary Natriello or Dr. Charles Lang.

**Area of focus in eLearning in the Workplace:** This area of focus is for students interested in applying cognitive research and theories to the design of more effective eLearning programs in workplaces and other organizations. eLearning is online learning programs usually created on the World Wide Web for use by learners at any time and place. Please contact Dr. David Guralnick for further information.

### Program of Study

At least 20 points must be earned in Teachers College courses. The remaining coursework, through Teachers College registration, may be completed in Teachers College or other graduate divisions of the University, but no more than 12 points of graduate credit from other faculties of the University will be credited toward the minimum point requirement. Graduate level courses in the University are numbered from 4000 and above. For the MA degree, no transfer credit is granted for work completed at other universities.

### Satisfactory Progress

Students are expected to make satisfactory progress toward the completion of degree requirements. If satisfactory progress is not maintained, a student may be dismissed from the program. Program faculty annually reviews each student’s progress. Where there are concerns about satisfactory progress,
students will be informed by the program faculty. If a student is performing below expectations, remedial work within an appropriate timeline may be required. If satisfactory progress is not maintained, a student may be dismissed from the program.