Cognitive Science in Education
Department of Human Development

M.A. PROGRAM
<u>Major Code: COGS</u>

Teachers College, Columbia University
2024 - 2025

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 practice 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 three areas of focus: Foundations of Cognition and Learning, Applications, and Intelligent Technologies.

In addition, each student registers for research practicum seminars during which they complete a substantive project as a culminating experience for the degree. Choice of advanced courses and research seminars should be shaped by the student's area of focus, 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):

Three courses selected from the following:

- HUD 4120 Methods of Empirical Research (3)
- HUDK 4015 Psychology of thinking (3)
- HUDK 4029 Cognition and Learning (3)
- HUDK 4080 Educational psychology (3)
- HUDK 5023 Cognitive development (3)
- HUDK 5042 Motivation in education (3)
- HUDK 5125 Cross-Cultural psychology (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,
  OR
- HUD 6500 Proseminar in Human Development (1), and HUDK 5324 Research work practicum (2) 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 three areas of study:

I.   Foundations of Cognition and Learning

- HUDK 4015 Psychology of thinking (3)
- HUDK 4027 Development of mathematical thinking (3)
- HUDK 4050 Core methods in educational data mining (3)
- HUDK 4051 Learning analytics: process and theory (3)
- HUDK 4052 Data, Learning, and Society (3)
- HUDK 4054 Managing education data (3)
- HUDK 5020 Development of creativity (3)
- HUDK 5024 Language development (2-3)
- HUDK 5025 Spatial thinking (3)
- HUDK 5029 Personality development and socialization across the lifespan (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 5053 Feature engineering studio (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- HUDK 5120 Development of creativity: the case study method (3)
- HUDK 5125 Cross-cultural psychology (3)

II.   Applications

- HUDK 4015 Psychology of thinking (3)
- HUDK 4027 Development of mathematical thinking (3)
- HUDK 4031 Data, testing, and meritocracy
- HUDK 4035 Technology and human development (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)
- HUDK 5100 Supervised research and practice (1-6)
- HBSK 4074 Development of reading comprehension strategies and study skills (3)
- EDPS 4021 Sociology of education (3)
- HBSK 4074 Reading comprehension strategies and study skills (3)
- ORL 5522 Evaluation methods I (3)

III.   Intelligent Technologies:

- HUDK 4011 Networked and online learning (3)
- HUDK 4015 Psychology of thinking (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 (3)
- HUDK 4040 Social media and users (3)
- HUDK 4050 Core methods in educational data mining (3)
- HUDK 4051 Learning analytics: Process and theory (3)
- HUDK 5025 Spatial thinking (3)
- HUDK 5030 Visual explanations (3)
- HUDK 5035 Psychology of media (3)
- HUDK 5036 Psychology of children's television (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- HUDK 5120 Development of creativity: the case study method (3)
- HUDK 5197 Psychology of eLearning in business and industry (3)
- HUDK 5037 Psychology of children's television (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- MSTU 4039 Video games in education (3)
- MSTU 5000 Possibility of virtual worlds (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. Research Literature Review
2. Design (and perhaps Implementation) Project Paper
3. Empirical Research Design Paper

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.