

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

ACADEMIC CATALOG 2016-2017

DEPARTMENT OF HUMAN DEVELOPMENT

Contact: Lenore Karo, Director of Academic Administration
Email: hud1@tc.columbia.edu
Phone: (212) 678-3310
Fax: (212) 678-3837
Address: 453 Grace Dodge Hall
Box: 118

PROGRAMS

- **COGNITIVE STUDIES IN EDUCATION 3**
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including:
 - Measurement and Evaluation
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Human Development

Contact Information

Department Chair: Professor Matthew Johnson

Contact: Lenore Karo, Director of Academic Administration

Email: hud1@tc.columbia.edu

Phone: (212) 678-3310

Fax: (212) 678-3837

Address: 453 Grace Dodge Hall

Box: 118

Mission

The Department of Human Development is devoted to promoting an understanding of human development in families, schools, and institutions across the lifespan. The department provides social scientists and educators with theories, empirical methods, and analytical tools for understanding and conducting research in human development and cognition and for helping solve educational and psychological problems.

Cognitive Studies in Education

Department of - Human Development

Contact Information

Phone: (212) 678-4190

Email: black@tc.edu

Director: Professor John B. Black

Program Description

In the Cognitive Studies 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 programs, 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.

For the doctoral programs, work settings after graduation might include research organizations or universities seeking faculty in cognitive psychology, educational psychology, educational technology, reading, and learning analytics.

Students in the Cognitive Studies 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 Studies 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 students' 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 advisors.

- **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. The culminating experience for master's students in this concentration is to conduct an empirical research study in the area of cognition or learning.
- **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 Studies in Education recognizes the importance of computational and allied technologies to both guide and be guided by cognitive research. Many of the courses in this area of focus are cross-listed with the programs in Communication, Computing, and Instructional Technology in the Department of Mathematics, Science, and Technology. As a culminating experience, master's students in this area of focus create and evaluate an educational technology application.

- **Area of focus in Reading Research:** This area of focus prepares students to do 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. The culminating experience for master's students is an empirical study in the area of reading.
- **Area of focus in Cognitive Studies of 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. The culminating experience for master's students is an empirical study of cognition in a classroom setting. For more information, email Professor Herbert Ginsburg (ginsburg@tc.edu).
- **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 and how these ideas affect the way 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. The culminating experience for master's students is an essay or project related to creativity. For more information, please contact Dr. Michael Hanson (mah59@columbia.edu).
- **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. The culminating experience for master's students is preparing a proposal and psychological evaluation of a specific media artifact, website, or technical application. Please contact Dr. Jamie Krenn (jlg2102@tc.columbia.edu) for more information.
- **Learning Analytics:** In this area of 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 Ryan Baker.
- **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. The culminating experience for master's students is the creation and

evaluation of an eLearning program. Please contact Dr. David Guralnick (dg2236@tc.columbia.edu) for more information.

Degree Summary

Cognitive Studies in Education (COGN)

- Master of Arts (M.A.)
- Doctor of Education (Ed.D.)
- Doctor of Philosophy (Ph.D.)

Educational Psychology: Cognitive, Behavioral, and Developmental Analysis (COGF)

- Master of Education (Ed.M.)

For a complete listing of degree requirements, please continue on to this program's "Degrees" section in this document

Degree Requirements

Master of Arts - 32 points

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:

- HUD 4120 Methods of empirical research (3)
- 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 (2-3) or, by permission,
- HUDK 6539 Research practicum in educational psychology, cognition, and learning (3)

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 Studies of 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 Normative perspectives on the analysis of learning and learners (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 8 points):

At least three courses outside the department selected in consultation with an advisor.

Integrative Project: Varies according to selected areas of focus: Cognition and Learning—an empirical cognitive research study; Intelligent Technologies—creation and evaluation of an educational technology program; Reading Research—an empirical reading research paper; Cognitive Studies of Educational Practice—an empirical study of cognition in a classroom setting; Creativity and Cognition—an essay or project related to creativity; eLearning in the Workplace -- creation and evaluation of an eLearning program; and Children’s media- a proposal and psychological evaluation of a media artifact, website, or technical application.

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. The culminating experience for master's students in this program is to conduct an empirical research study in the area of cognition or learning.

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 Studies recognizes the importance of computational and allied technologies to both guide and be guided by cognitive research. Many of the courses in this area of focus are cross-listed with the Programs in Communication, Computing, and Instructional Technology (MSTU). As a culminating experience, master’s students in this area of focus create and evaluate an educational technology application.

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. The culminating experience for master’s students is an empirical study in the area of reading.

Area of focus in Cognitive Studies of 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. The culminating experience for master’s students is an empirical study of cognition in a classroom setting. For more information, email Dr. Herbert Ginsburg.

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. The culminating experience for master's students is an essay or project related to creativity. For further information, contact Dr. Michael Hanson.

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. The culminating experience for master's students is preparing a proposal and psychological evaluation of a specific media artifact, website, or technical application. Please contact Dr. Jamie Krenn for more information.

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 Ryan Baker.

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. The culminating experience for master's students is the creation and evaluation of an eLearning program. 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.

Master of Education - 60 points

Core Courses (9 points):

All 3 courses are required

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

Statistics/Research Design (12 points):

At least four of the following:

- HUD 4120 Methods of empirical research (3)
- 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 (2-3) or, by permission,
- HUDK 6539 Research practicum in educational psychology, cognition, and learning (3)

Specialized Courses (24-27 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 Studies of 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 Normative perspectives on the analysis of learning and learners (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 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)

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 8 points):

At least three courses outside the department selected in consultation with an advisor.

Integrative Project: Varies according to selected areas of focus: Cognition and Learning—an empirical cognitive research study; Intelligent Technologies—creation and evaluation of an educational technology program; Reading Research—an empirical reading research paper; Cognitive Studies of Educational Practice—an empirical study of cognition in a classroom setting; Creativity and Cognition—an essay or project related to creativity; eLearning in the Workplace -- creation and evaluation of an eLearning program; and Children’s media- a proposal and psychological evaluation of a media artifact, website, or technical application.

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By offering this area of focus, the Program in Cognitive Studies recognizes the importance of computational and allied technologies to both guide and be guided by cognitive research. Many of the courses in this area of focus are cross-listed with the Program in Communication, Media, and Learning Technologies Design Computing (MSTU). As a culminating experience, master’s students in this area of focus create and evaluate an educational technology application.

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. The culminating experience for master’s students is an empirical study in the area of reading.

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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 Ryan Baker.

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. The culminating experience for master's students is the creation and evaluation of an eLearning program. Please contact Dr. David Guralnick for further information.

Program of Study

Thirty points must be completed under the auspices of Teachers College, including 18 points in Teachers College courses. A maximum of 30 points of graduate credit may be transferred from other recognized institutions. Candidates who have completed an M.A. or M.S. degree through Teachers College must register for a minimum of 45 points of the required 60 through Teachers College.

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.

Doctor of Education - 90 points

Doctor of Education - 90 points

Required Courses (9 points):

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

Statistics (12 points):

Optional: HUDM 4120: Basic concepts in statistics (3) This course is not recommended for those who have taken undergraduate statistics.

Required:

- HUDM 4122 Probability and statistical inference (3)
- HUDM 5122 Applied regression analysis (3)
- HUDM 5123 Linear models and experimental design (3)
- HUDM 6122 Multivariate analysis (3)

Specialized Courses (minimum of 30 points): Selected in consultation with an advisor and focusing on **one** of the following areas:

Cognition and Learning:

- HBSK 5096 Psychology of memory (3)
- 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)
- HUDK 5042 Motivation in education (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- HUDM 5058 Choice and decision making (3)

Intelligent Technologies:

- HUDK 4015 Psychology of thinking (3)
- HUDK 4035 Technology and human development (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 5037 Psychology of children's television (3)
- HUDK 5042 Motivation in education (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- HUDK 5197 Psychology of elearning in business and industry (3)

Reading Research:

- HBSK 4074 Development of reading comprehension strategies and study skills (3)
- 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)

Cognitive Studies of Educational Practice:

- EDPS 4021 Sociology of education (3)
- HBSK 4074 Development of reading comprehension strategies and study skills (3)
- HUDK 4015 Psychology of thinking (3)
- HUDK 4035 Technology and human development (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 Normative perspectives on the analysis of learning and learners (3)
- HUDK 4054 Managing education data (3)
- HUDK 5053 Feature engineering studio (3)

Research Apprenticeship (6 points):

Two semesters in a research practicum:

HUDK 6539 Research practicum in educational psychology, cognition, and learning (1-3), two semesters for 3 pts each required

Special Seminars (minimum of 5 points):

- HUD 6500 Doctoral proseminar (1-2), taken during the Fall and Spring of the first year -- one point during the Fall term and 2 points during the Spring.
- HUDK 7502 Dissertation seminar (1-3), taken two semesters for minimum of 1 point each
- HUDK 8901 Dissertation advisement (0)

Breadth/Foundation Courses (12 Points):

One course (minimum of 3 points) in each of the 4 following areas:

1. Biological Basis of Behavior:

- BBS 5068-5069 Brain and behavior I and II (combined for 3 points)
- BBSN 4000 Cognitive neuroscience
- BBSN 5033 Human clinical neuropsychology
- MSTC 5000 Neurocognitive models of information processing

2. Cognitive Basis of Behavior:

- HBSK 5096 Psychology of memory
- HUDK 4015 Psychology of thinking
- HUDK 5025 Spatial thinking
- HUDK 5090 Psychology of language and reading

3. Social Cultural Factors and Individual Differences:

- CCPX 5034 Child psychopathology
- HBSK 5031 Family as a context for child development
- HUDK 5029 Personality development and socialization across the lifespan
- HUDK 5040 Development and psychopathology: Atypical contexts and populations
- HUDK 5121 Personality development and socialization in childhood
- HUDK 5125 Cross-cultural psychology
- ORLJ 5017 Small group intervention: Theory and method
- ORLJ 5106 Psychological aspects of organizations
- ORLJ 5540 Pro-seminar in social and organizational psychology

4. Measurement:

- HUDM 5059 Psychological measurement

Please note: Courses used to fill Breadth/Foundation course requirements may not be used to fulfill requirements in another area.

Non-departmental Courses (minimum of 8 points):

At least three courses outside the department selected in consultation with an advisor.

Additional Requirements:

- Two approved papers: an empirical study and an integrative research literature survey
- Successful performance on the Certification Examination
- Approved dissertation

Transfer Credit:

Relevant courses with earned grades of B or higher taken in other recognized graduate schools to a maximum of 45 points. For more information, please contact the Transfer Credit Coordinator in the Registrar's Office.

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. Where there are concerns about satisfactory progress, students will be informed by the program faculty.

Doctor of Philosophy - 75 points

Doctor of Philosophy-75 points

Required Courses (9 points):

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

Statistics (12 points):

Optional: HUDM 4120 Basic concepts in statistics (3) This course is not recommended for those who have taken undergraduate statistics.

Required:

- HUDM 4122 Probability and statistical inference (3)
- HUDM 5122 Applied regression analysis (3)
- HUDM 5123 Linear models and experimental design (3)
- HUDM 6122 Multivariate analysis (3)

Specialized Courses (minimum of 15 points): Selected in consultation with an advisor and focusing on one of the following areas of focus:

Cognition and Learning:

- HBSK 5096 Psychology of memory (3)
- 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)
- HUDK 5042 Motivation in education (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- HUDM 5058 Choice and decision making (3)

Intelligent Technologies:

- HUDK 4015 Psychology of thinking (3)
- HUDK 4035 Technology and human development (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 5037 Psychology of children's television (3)
- HUDK 5042 Motivation in education (3)
- HUDK 5063 Cognitive development beyond childhood (3)
- HUDK 5197 Psychology of eLearning in business and industry (3)

Reading Research:

- HBSK 4074 Development of reading comprehension strategies and study skills (3)
- 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)

Cognitive Studies of Educational Practice:

- EDPS 4021 Sociology of education (3)
- HBSK 4074 Development of reading comprehension strategies and study skills (3)
- HUDK 4015 Psychology of thinking (3)
- HUDK 4035 Technology and human development(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 Normative perspectives on the analysis of learners and learning (3)
- HUDK 4054 Managing education data (3)
- HUDK 5053 Feature engineering studio (3)

Research Apprenticeship (6 points):

Two semesters in a research practicum:

- HUDK 6539 Research practicum in educational psychology, cognition, and learning (1-3), two semesters for 3 pts each required.

Special Seminars (minimum of 5 points):

- HUD 6500 Doctoral Proseminar (1-2), taken during the Fall and Spring of the first year -- one point during the Fall term and 2 points during the Spring
- HUDK 7502 Dissertation seminar (1-3), taken two semesters for minimum of 1 pt each
- HUDK 8901 Dissertation Advisement (0), taken after registration in HUDK 7502 and until registration for TI 8900
- TI 8900 PhD Dissertation defense

Breadth/Foundation Courses (12 Points):

One course (minimum of 3 points) in each of the 4 following areas:

1. Biological Basis of Behavior:

- BBS 5068-5069 Brain and behavior I and II (combined for 3 points)
- BBSN 4000 Cognitive neuroscience
- BBSN 5033 Human clinical neuropsychology
- MSTC 5000 Neurocognitive models of information processing

2. Cognitive Basis of Behavior:

- HBSK 5096 Psychology of memory
- HUDK 4015 Psychology of thinking
- HUDK 5025 Spatial thinking
- HUDK 5090 Psychology of language and reading

3. Social Cultural Factors and Individual Differences:

- CCPX 5034 Child psychopathology
- HBSK 5031 Family as a context for child development
- HUDK 5029 Personality development and socialization across the lifespan
- HUDK 5040 Development and psychopathology: atypical contexts and populations
- HUDK 5121 Personality development and socialization in childhood
- HUDK 5125 Cross-cultural psychology
- ORLJ 5017 Small group intervention: theory and method
- ORLJ 5106 Psychological aspects of organizations
- ORLJ 5540 Pro-seminar in social and organizational psychology

4. Measurement:

- HUDM 5059 Psychological measurement (3)

*Please note: Courses used to fill Breadth/Foundation course requirements may not be used to fulfill requirements in another area.

Non-departmental Courses (minimum of 8 points):

At least three courses outside the department and selected in consultation with an advisor.

Additional Requirements:

- Two approved papers: an empirical study and an integrative research literature survey
- Successful performance on the Certification Examination
- Approved dissertation

M.Phil. Degree:

The M. Phil is an *en passant* degree awarded to those nearing the completion of the Ph.D. degree. The student contacts the Office of Doctoral Studies to file for award of the degree.

To receive the M. Phil., the student must satisfactorily complete the following requirements:

1. File an approved "Program Plan of Study" with the Office of Doctoral Studies
2. Complete at least six courses with evaluative grades under Teachers College registration
3. Pass the Certification Examination
4. Complete an approved empirical research paper
5. Complete an approved theoretical research paper
6. Complete all 75 points of coursework required for the degree.

Please note: Students must submit a copy of their "Program Plan of Study" and both research papers to the Department of Human Development for record keeping purposes.

Transfer Credit:

Relevant graduate courses with earned grades of B or higher taken in other recognized graduate schools to a maximum of 30 points, or 45 points if completed in another Faculty of Columbia University, may be accepted toward the minimum point requirement for the Ph.D. degree. For more information, please contact the Transfer Credit Coordinator in the Registrar's Office.

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. Where there are concerns about satisfactory progress, students will be informed by the program faculty.

Application Information

The GRE General Test is required for admission to the doctoral programs.

Faculty List

Faculty

RYAN S. BAKER ([HTTP://TC.EDU/FACULTY/RSB2162](http://tc.edu/faculty/rsb2162))

Associate Professor of Cognitive Studies

JOHN B BLACK ([HTTP://TC.EDU/FACULTY/JBB21](http://tc.edu/faculty/jbb21))

Cleveland E. Dodge Professor of Telecommunications & Ed.

CATHERINE CHI CHASE

([HTTP://TC.EDU/FACULTY/CC3663](http://tc.edu/faculty/cc3663))

Assistant Professor of Cognitive Studies

JAMES E CORTER ([HTTP://TC.EDU/FACULTY/JEC34](http://tc.edu/faculty/jec34))

Professor of Statistics and Education

LAWRENCE DeCARLO

([HTTP://TC.EDU/FACULTY/LD208](http://tc.edu/faculty/ld208))

Professor of Psychology and Education

HERBERT P GINSBURG

([HTTP://TC.EDU/FACULTY/HPG4](http://tc.edu/faculty/hpg4))

Jacob H Schiff Foundations Prof of Psychology & Education

Adjunct

MICHAEL JEFFREY DEAN

([HTTP://TC.EDU/FACULTY/MJD44](http://tc.edu/faculty/mjd44))

Adjunct Assistant Professor of Education

DAVID GURALNICK

([HTTP://TC.EDU/FACULTY/DG2236](http://tc.edu/faculty/dg2236))

Adjunct Assistant Professor

ALYSE CHRISTINE HACHEY

([HTTP://TC.EDU/FACULTY/ACH48](http://tc.edu/faculty/ach48))

Adjunct Assistant Professor of Psychology and Education

PETER GORDON ([HTTP://TC.EDU/FACULTY/PG328](http://tc.edu/faculty/pg328))

Associate Professor of Neuroscience and Education

DEANNA KUHN ([HTTP://TC.EDU/FACULTY/DK100](http://tc.edu/faculty/dk100))

Professor of Psychology and Education

XIAODONG D LIN

([HTTP://TC.EDU/FACULTY/XDL2001](http://tc.edu/faculty/xdl2001))

Associate Professor of Cognitive Studies

GARY J NATRIELLO ([HTTP://TC.EDU/FACULTY/GJN6](http://tc.edu/faculty/gjn6))

Ruth L. Gottesman Prof. in Educ. Research

BARBARA TVERSKY ([HTTP://TC.EDU/FACULTY/BT2158](http://tc.edu/faculty/bt2158))

Professor of Psychology and Education

MICHAEL ALAN HANCHETT HANSON

([HTTP://TC.EDU/FACULTY/MAH59](http://tc.edu/faculty/mah59))

Adjunct Assistant Professor of Psychology and Education

JAMIE L. KRENN ([HTTP://TC.EDU/FACULTY/JLG2102](http://tc.edu/faculty/jlg2102))

Adjunct Assistant Professor of Psychology and Education

JUDITH MILLER ([HTTP://TC.EDU/FACULTY/JM1398](http://tc.edu/faculty/jm1398))

Adjunct Professor of Psychology and Education

Course List

HUDK 4015 PSYCHOLOGY OF THINKING

Examines cognitive psychology theories and research about various kinds of thinking, what each kind is best suited for, and problems people have with it. Also examines the best ways of learning from each kind of thinking. Critically examines the various thinking skills curricula that have been proposed.

HUDK 4027 DEVELOPMENT OF MATHEMATICAL THINKING

The development of informal and formal mathematical thinking from infancy through childhood with implications for education.

HUDK 4029 HUMAN COGNITION AND LEARNING

Cognitive and information-processing approaches to attention, learning, language, memory, and reasoning. Fee: \$20.

HUDK 4030 COGNITIVE CLINICAL INTERVIEW

Introduction to the cognitive clinical interview and exploration of how it has and can be used in psychological and educational research and assessment.

HUDK 4035 TECHNOLOGY AND HUMAN DEVELOPMENT

Examines the use and design of various educational technologies (computer software, multimedia shareware, TV, World Wide Web sites, etc.) from the perspective of basic research and theory in human cognitive and social development. Provides a framework for reasoning about the most developmentally appropriate uses of technology for people at different ages.

HUDK 4080 EDUCATIONAL PSYCHOLOGY

Examines landmark issues in educational psychology, highlighting philosophical underpinnings and empirical evidence, tracing each issue from its roots to contemporary debates and evaluating current educational practice.

HUDK 4902 RESEARCH AND INDEPENDENT STUDY

Permission required.

HUDK 5020 THE DEVELOPMENT OF CREATIVITY

Major theories and contemporary research in creative work, emphasizing case studies of exceptional and historically influential individuals.

HUDK 5023 COGNITIVE DEVELOPMENT

Theory and research on the development of cognitive processes across the lifespan.

HUDK 5025 SPATIAL THINKING

Analyzes research on how people learn, mentally represent, mentally transform, describe, and act on the spaces they encounter. Mental models of and transformations of space underlie the way people think about abstract domains, so thought about space has implications for thought in general. Implications for education and HCI are considered.

HUDK 5030 VISUAL EXPLANATIONS

Surveys production and comprehension of visualizations ranging from ancient cave paintings and petroglyphs to diagrams, charts, graphs, comics, picture books, photographs, gesture, and film to extract and apply

techniques for conveying objects, actions, forces relations, and emotions, meanings that are both inherently visible and non-visible. Implications for education, art, media, and HCI are drawn.

HUDK 5035 PSYCHOLOGY OF MEDIA

Covers psychological theories and research that relate to various media and what people learn directly and indirectly from them.

HUDK 5063 COGNITIVE DEVELOPMENT BEYOND CHILDHOOD

Examination of all aspects of cognitive functioning over the major portion of the life cycle that occurs beyond childhood, addressing both common patterns and individual and cultural variations. A particular focus will be critical examination of the research methods by which such knowledge is gained.

HUDK 5090 PSYCHOLOGY OF LANGUAGE AND READING

Basic theories, empirical findings, and educational applications in the psychology of language and reading: the cognitive processes involved in the perception and production of oral and written language.

HUDK 5197 PSYCHOLOGY OF TRAINING IN E-LEARNING AND INDUSTRY

Design of e-learning in workplace environments, from a perspective that looks to put academic research into practice. Real-world cases, including numerous demonstrations of real-life courses and systems, will be used to explore uses of e-learning in the workplace for both training and "just-in-time" performance support purposes.

HUDK 5324 RESEARCH WORK PRACTICUM

Students learn research skills by participating actively in an ongoing faculty research project.

HUDK 6095 CRITICAL REVIEW OF CURRENT JOURNALS IN PSYCHOLOGY

Limited to candidates in psychology; others by permission. Critical review of current journals in psychology and education, analysis of articles, discussion of general trends in current theoretical and research literature, and guidance in preparing manuscripts for publication in peer-reviewed journals.

HUDK 6523 SEMINAR IN COGNITIVE DEVELOPMENT

Permission required. Advanced topics in research and theory in cognitive development.

HUDK 6530 SEMINAR IN THEORETICAL ISSUES IN COGNITIVE AND EDUCATIONAL PSYCHOLOGY

Permission required. Limited to doctoral candidates in psychology.

HUDK 6539 RESEARCH PRACTICUM IN EDUCATIONAL PSYCHOLOGY, COGNITION, AND LEARNING

Permission required. Limited to doctoral candidates in psychology.

HUDK 6902 ADVANCED RESEARCH AND INDEPENDENT STUDY

Permission required.

HUDK 7502 DISSERTATION SEMINAR

Permission required. Development of doctoral dissertation and presentation of plans for approval. Registration limited to two terms.

HUDK 8901 DISSERTATION ADVISEMENT - HUMAN COGNITION AND LEARNING

Individual advisement on doctoral dissertation. Fee to equal 3 points at current tuition rate for each term. See catalog section on Continuous Registration for Ed.D./Ph.D. degrees.

Developmental Psychology Programs

Department of - Human Development

Contact Information

Phone: (212) 678-4190

Fax: (212) 678-3837

Email: behrman@tc.edu

Director: Professor Jeanne Brooks-Gunn

Program Description

Developmental psychology focuses on the development of individuals across their lifespan within the context of family, peer groups, childcare and after-school programs, schools, neighborhoods, and larger communities and society. It considers the well-being of children, youth, and adults, vis-a-vis the cognitive, emotional, social, academic, and health domains. Our Program is concerned about disparities among groups (for example, gender, resources such as parental income and education, ethnicity, and immigrant status) as well as the ways in which equity among groups may be promoted. The pathways through which such disparities emerge is our focus of inquiry, as well as the promotion of educational and social strategies for ameliorating them. The Program stresses theory and research in the service of policy and practice.

Master of Arts (M.A.)

The Master of Arts in developmental psychology typically requires completion of 32 points. In accordance with individual interests and objectives, students acquire familiarity with basic theoretical and research orientations as well as exposure to substantive knowledge in the areas of cognitive, language, personality, and social functioning and development. Opportunity exists for the study of deviant as well as normal psychological functioning within a developmental framework.

Students may pursue independent study in order to undertake theoretical or empirical research projects or fieldwork. Students whose goal is to acquire professional skills in clinical or counseling psychology may enroll in introductory course offerings, which in many cases can be applicable if the student is later admitted to one of the more advanced master's or doctoral programs in these areas.

In order to accommodate the diverse aims of individual students, a considerable degree of flexibility has been built into the course of study leading to the M.A. degree. An attempt has been made to minimize specific course requirements, and the student will find that there is a good deal of freedom to choose from among the many offerings provided by Teachers College. In consultation with an advisor, students may create an individually tailored program of study or may enter an area of focus in Risk, Resilience, and Prevention; Developmental Psychology for Educators; Creativity and Cognition; Policy for Children and Families; or Children's Media: Analysis and Evaluation.

The course of study has these main components:

- A basic course in methods of research.
- Required courses in cognitive development, personality development in atypical populations, and social and personality development.
- A basic course in statistics.
- Research practicum.

- Electives in developmental psychology plus relevant electives offered by other Teachers College programs.
- A special project.

Students completing the M.A. degree accept positions in research laboratories or field settings, biomedical institutions, educational and child care agencies, foundations, public policy settings, state and local governments, community programs, and as instructors in community colleges, or they go on to pursue more advanced degrees in particular areas of specialization.

Students may elect, but are not required, to focus study in one of the following areas:

- **Risk, Resilience, and Prevention:** This area of focus brings knowledge of developmental psychology to future work relating to competence and maladjustment among at-risk children and families. Diverse areas are considered, ranging from intellectual giftedness/mental retardation and academic achievement to child poverty, cross-cultural differences, resilience, and different domains of psychopathology.
- **Developmental Psychology for Educators:** This area of focus helps to promote an understanding of development in varying social contexts and cultures, ethnic and racial groups, and social classes. It focuses on how knowledge about development, thinking, and learning can be applied to educational practice and to educational policy.
- **Creativity and Cognition:** Focusing on the importance, development, and influence of creativity, this area is designed for those interested in creative problem-solving and multi-modal thinking as it affects the classroom, curriculum development, community organizations, therapeutic settings, and business.
- **Policy for Children and Families:** This area of focus is intended for students who seek to bring knowledge of developmental psychology to future work relating to public and/or education policy. Through coursework, students critically examine federal legislative policies for children and families within the United States with a particular focus on how evaluation studies examining the effectiveness of such policies. Students pursuing this concentration are required to complete a special project that demonstrates their competence in developmental psychology and policy. Examples of acceptable projects include: policy brief or memo, policy analysis, and research proposal for a policy-oriented research study.
- **Children's Media: Analysis and Evaluation:** This area of focus is intended 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. Students pursuing this concentration are required to complete a special project in which they prepare a proposal, pilot study, or psychological evaluation of a specific media artifact, website, or technical application.

Doctor of Philosophy (Ph.D.)

The 75-point doctoral degree prepares students for faculty positions in colleges, graduate schools of education, and universities, and for positions as research associates in research laboratories, biomedical schools, foundations, public policy, and arts and sciences, as well as policy research firms, governmental agencies, and NPOs. Throughout their program, doctoral candidates work in a close apprentice relationship with a faculty advisor of their choice. The Ph.D. degree requires completion of 75 points with an empirical research dissertation.

The aim of instruction at the doctoral level is to produce a psychologist who can make a sound and innovative research contribution to the study of human development, who is concerned with the relationship between development and education, and who is equipped to teach about such matters. Students acquire the conceptual background and methodological skills necessary for faculty positions in colleges and universities or for positions as associates and consultants in research laboratories, biomedical schools, and other applied settings.

While consultation between student and faculty advisor is considered to be the best way to decide which steps should be taken towards these goals, there are specific requirements for all students in Developmental Psychology that serve to define the character of the program and to ensure that all students have a common experience and acquire a common level of expertise in dealing with the core issues in the field.

The courses offered through the program provide content in the research and theoretical literature relating to all phases of the psychology of human development. All age groups are covered, from infancy through childhood, adolescence to adulthood, and later life. Coursework in developmental psychology can be supplemented by courses in the other psychology programs at Teachers College as well as by courses in the social sciences, linguistics, and other fields offered at Teachers College and the graduate faculty of Columbia University (including the Columbia University College of Physicians and Surgeons). The doctoral program is focused primarily on training in the conduct of empirical (e.g., experimental, observational, and interview) research. Other types of research (theoretical, descriptive, and historical) may be undertaken in special circumstances of student and advisor competence.

Degree Summary

Psychology-Developmental (DEVM)

- Master of Arts (M.A.)

Developmental Psychology (DEVD)

- Doctor of Philosophy (Ph.D.)

For a complete listing of degree requirements, please continue on to this program's "Degrees" section in this document

Degree Requirements

Master of Arts - 32 points

A. Five CORE courses taken for 3 points each.

1. The following three courses:

- HUD 4120 Methods of Empirical Research
- HUDK 5023 Cognitive Development
- HUDK 5040 Development and Psychopathology: Atypical Contexts and Populations

2. One of the following two courses on Social-Emotional Development:

- HUDK 5029 Personality Development and Socialization across the Lifespan
- HUDK 5121 Children's Social and Emotional Development in Context

3. A fifth course selected from among the following options:

- BBS 5068 - 5069 Brain and Behavior I and II (taken for a total of 3 points)
- HUDK 4027 Development of Mathematical Thinking
- HUDK 4029 Human Cognition and Learning
- HUDK 4080 Educational Psychology
- HUDK 5024 Language Development
- HUDK 5025 Spatial Thinking
- HUDK 5030 Visual Explanations

B. One of the following three STATISTICS courses taken for 3 points:

- HUDM 4120 Basic Concepts in Statistics (if no undergraduate statistics)
- HUDM 4122 Probability/Statistical Inference
- HUDM 5122 Applied Regression Analysis

C. Two SPECIALIZED Courses in the Developmental Psychology Program taken for 3 points each.

1. HUDK 5324 Research Work Practicum
2. One additional course in the Developmental Psychology Program

D. Two additional COURSES OUTSIDE the Developmental Psychology Program taken for 2-3 points each. (To meet the College breadth requirement, students must take a total of three courses outside the program, each for 2 or 3 credits, including core course work that falls outside of Developmental Psychology).

E. One ELECTIVE COURSE selected in consultation with an advisor.

F. In consultation with an advisor and with permission of the supervising faculty member, a relevant independent study may be taken, but is not required.

G. Special Project (not taken for points):

The special project is intended to be a "culminating experience" that allows students to integrate in one paper various aspects of what has been learned at Teachers College. It is an undertaking that carries no credit and does not require payment of tuition. The project does not have to be an empirical study; it can be a literature review, theoretical paper, or an evaluation of an educational program. If the special project involves an empirical study, it does not have to be a complete investigation; it can be a report of a pilot study. Students should aim to generate an organized, scholarly document, reporting thoughtful, careful, and rigorous work. The special project may not be conducted as part of a course, and its content may not be

directly connected with any coursework done at Teachers College. Any TC faculty member may be a sponsor for a special project in our department. However, the MA advisor must be informed and grant approval if students wish to work with a faculty member outside the department.

Optional Areas of Focus:

Within the constraints described above -- required courses, electives, breadth requirements, research requirement, and special project --students may design their own program of study in coordination with their faculty advisors.

Another option is to enter one of the five areas of focus - **Risk, Resilience, and Prevention; Developmental Psychology for Educators; Policy for Children and Families; Creativity and Cognition; or Children's Media.**

Details concerning requirements for each area of focus are presented at the Student Orientation at the beginning of the fall semester and are also available in the department office.

Transfer Credit

For the M.A. 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. 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.

FOR MORE INFORMATION PLEASE CONTACT:

Laurie Behrman

Academic Secretary

Cognitive Studies in Education

Developmental Psychology

P: 212-678-4190

E: behrman@exchange.tc.columbia.edu (mailto:behrman@exchange.tc.columbia.edu)

(mailto:behrman@tc.edu)

Doctor of Philosophy

Courses and Requirements

Core Courses:

Students are generally advised to take the following four courses in developmental psychology in their first year of doctoral studies.

- HUDK 5040 Developmental and psychopathology: Atypical contexts
- HUDK 6520 Seminar on lifespan development
- HUDK 6523 Seminar in cognitive development
- ORLJ 5040 Research methods in social psychology I

Statistics Sequence:

The following four statistics courses are required, and students are advised to begin enrollment during the first semester of study. HUDM 4122 may be waived for students who have taken appropriate coursework

in statistics at the undergraduate/graduate level or who have passed an equivalency examination. Please contact Chanel Harry (ch3196@tc.columbia.edu) for more information.

- HUDM 4122 Probability and statistical inference
- HUDM 5122 Applied regression analysis
- HUDM 5123 Linear models and experimental Design
- HUDM 6122 Multivariate analysis

Once this sequence is finished, students may find it helpful to take one or both of the following courses, which provide instruction on more advanced topics:

- HUDM 6030 Multilevel and longitudinal data analysis
- HUDM 6055 Latent structure analysis

Breadth Requirement:

All doctoral students must take at least one course for a minimum of 3 points in each of the following four areas listed below. The courses must be other than courses required as part of the program core. Students should consult with their advisors about whether specific courses meet program requirements. Examples of suitable courses are included below, you may also consult the TC course catalog for other examples. Note that courses used to fill the Breadth/Foundation course requirements may not be used to fulfill requirements in another area.

Biological Basis of Behavior:

- BBS 5068 Brain & behavior I and BBS 5069 Brain and behavior II (total 3 points)
- MSTC 5000 Neurocognitive Models of Information Processing

Cognitive Basis of Behavior:

- CCPX 5020 Cognition, emotion, and culture
- HBSK 5096 Psychology of memory
- HUDK 4015 Psychology of thinking
- HUDK 4029 Human cognition and learning
- HUDK 5023 Cognitive development
- HUDK 5024 Language development
- HUDK 5025 Spatial thinking
- HUDK 5030 Visual explanations
- HUDK 5090 Psychology of language and reading

Social Cultural Factors & Individual Differences:

- HBSK 5031 Family as context for child development
- HUDK 5029 Personality development and socialization across the lifespan
- HUDK 5121 Children's social and emotional development in context
- HUDK 5125 Cross cultural psychology
- HUDK 6036 Child and family policy I
- ORLJ 5017 Small group intervention: Theory and method
- ORLJ 5106 Psychological aspects of organizations
- ORLJ 5540 Proseminar in social and organizational psychology

Measurement:

- HUDM 5059 Psychological measurement
- HUDM 6051 Psychometric theory
- HUDM 6055 Latent structure analysis

Proseminar Requirement:

Doctoral Students are required to enroll in proseminar during the fall and spring of their first year. The course is taken for 1-3 credits per semester, totaling 3 credits for the year. This course covers various topics

integral to the doctoral experience and is a great way for students to present their work amongst peers and gain feedback.

HUD 6500 Doctoral Proseminar (2 semesters)

Out-of-Department Requirement:

Doctoral students must take at least three courses outside the department.

Course Assistantship Requirement:

Doctoral students must be a course assistant for two master's-level courses, which can include HUDK 5324, the Master's Practica. For more information, please visit the Department of Human Development located in Grace Dodge Hall, room 453.

Certification Papers:

The two advanced requirements that are met prior to presenting a dissertation proposal are an original theoretical paper and an original empirical research paper in the student's area of specialization. For more information, please visit the Department of Human Development located in Grace Dodge Hall, room 453.

Certification Examination:

As part of their certification requirements, all students must take a three-hour examination in research methods.

Post-Certification Requirement:

Ph.D. candidates must take a minimum of 15 additional points after meeting certification requirements, including the points enrolled during the semester in which certification occurs.

Dissertation Seminar:

For a dissertation proposal to be approved, the student must enroll in Dissertation Seminar (HUDK 7501). Dissertation Seminar is typically taken for one semester-- the semester in which the student wishes to finish the dissertation proposal and have it approved. It can be taken for a maximum of two semesters. If the proposal is not approved in the first semester, the student must register for a second semester. After the approval of the proposal or the completion of the second semester, whichever comes first, the student proceeds automatically into registration for Dissertation Advisement.

Dissertation Proposal Hearing:

When the student and the advisor have agreed on a proposal for dissertation research, a proposal hearing will be scheduled.

Advanced Seminar:

After completing the collection of data, the student will request that an Advanced Seminar be scheduled. The purpose of the Advanced Seminar is for the committee to review data and their analysis before the final Dissertation Defense.

Dissertation Defense:

Requirements for the scheduling of the dissertation defense and composition of the dissertation committee can be found in the requirements bulletin for the Degree of Doctor of Philosophy (obtainable from the Office of Doctoral Studies).

M.Phil. Degree:

The M. Phil is an *en passant* degree awarded to those nearing the completion of the Ph.D. degree. The student contacts the Office of Doctoral Studies to file for award of the degree.

To receive the M. Phil., the student must satisfactorily complete the following requirements:

1. File an approved "Program Plan of Study" with the Office of Doctoral Studies
2. Complete at least six courses with evaluative grades under Teachers College registration
3. Pass the Certification Examination
4. Complete an approved empirical research paper

5. Complete an approved theoretical research paper
6. Complete all 75 points of coursework required for the degree.

Please note: Students must submit a copy of their Program Plan of Study and both research papers to the Department of Human Development for record keeping purposes.

Transfer Credit:

Relevant graduate courses with earned grades of B or higher taken in other recognized graduate schools to a maximum of 30 points, or 45 points if completed in another Faculty of Columbia University, may be accepted toward the minimum point requirement for the Ph.D. degree. For more information, please contact the Transfer Credit Coordinator in the Registrar's Office.

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. Where there are concerns about satisfactory progress, students will be informed by the program faculty.

Application Information

Master of Arts (M.A.)

Applicants who have undergraduate degrees in fields other than psychology will be considered for admission to the M.A. program, as well as those whose previous training is in psychology.

Doctor of Philosophy (Ph.D.)

This program accepts applications for fall semester only. GRE is required; Subject Test in Psychology is optional. Admission to the program is highly competitive. Primary emphasis in evaluating applicants is given to prior achievements and recommendations, particularly as evidence of a self-motivated research involvement.

Previous work in psychology is highly desirable, but there are no fixed course requirements. Expertise in a related field, such as linguistics, philosophy, anthropology, or biology, may qualify a student as well. At least one year of full-time study in residence, i.e., two semesters of 12 or more points per semester, is required.

Faculty List

Faculty

JEANNE BROOKS-GUNN

([HTTP://TC.EDU/FACULTY/JB224](http://TC.EDU/FACULTY/JB224))

Virg.& Leo. Marx Prof. of Child and Parent Dev.Ed.

PETER GORDON ([HTTP://TC.EDU/FACULTY/PG328](http://TC.EDU/FACULTY/PG328))

Associate Professor of Neuroscience and Education

CAREY ELIZABETH COOPER

([HTTP://TC.EDU/FACULTY/CEC2204](http://TC.EDU/FACULTY/CEC2204))

Assistant Professor of Developmental Psychology

DEANNA KUHN ([HTTP://TC.EDU/FACULTY/DK100](http://TC.EDU/FACULTY/DK100))

Professor of Psychology and Education

HERBERT P GINSBURG

([HTTP://TC.EDU/FACULTY/HPG4](http://TC.EDU/FACULTY/HPG4))

Jacob H Schiff Foundations Prof of Psychology & Education

GARY J NATRIELLO ([HTTP://TC.EDU/FACULTY/GJN6](http://TC.EDU/FACULTY/GJN6))

Ruth L. Gottesman Prof. in Educ. Research

Adjunct

MICHAEL ALAN HANCHETT HANSON

([HTTP://TC.EDU/FACULTY/MAH59](http://TC.EDU/FACULTY/MAH59))

Adjunct Assistant Professor of Psychology and Education

SARI LOCKER ([HTTP://TC.EDU/FACULTY/SL2036](http://TC.EDU/FACULTY/SL2036))

Adjunct Assistant Professor of Psychology and Education

JOSEPH ROCKY LAO ([HTTP://TC.EDU/FACULTY/JRL19](http://TC.EDU/FACULTY/JRL19))

Adjunct Associate Professor of Psychology and Education

JUDITH MILLER ([HTTP://TC.EDU/FACULTY/JM1398](http://TC.EDU/FACULTY/JM1398))

Adjunct Professor of Psychology and Education

Instructors

TOI SIN Y. ARVIDSSON

([HTTP://TC.EDU/FACULTY/TYA2102](http://TC.EDU/FACULTY/TYA2102))

Course List

HUD 4120 METHODS OF EMPIRICAL RESEARCH

An introduction to the methods of scientific inquiry, research planning, and techniques of making observations and analyzing and presenting data.

HUDK 4021 DEVELOPMENTAL PSYCHOLOGY: INFANCY

Review of research and theory in early perceptual, cognitive, and social/emotional development, with particular attention to the interaction of biological and environmental factors in early life.

HUDK 4022 DEVELOPMENTAL PSYCHOLOGY: CHILDHOOD

Children's cognition, perception, representation, language, affect, personality, and sexuality. Family structure and school as they influence these aspects of childhood.

HUDK 4023 DEVELOPMENTAL PSYCHOLOGY: ADOLESCENCE

Theoretical and empirical studies of personality and social development processes in adolescence. An ecological systems approach is emphasized.

HUDK 4027 DEVELOPMENT OF MATHEMATICAL THINKING

The development of informal and formal mathematical thinking from infancy through childhood with implications for education.

HUDK 4030 COGNITIVE CLINICAL INTERVIEW

Introduction to the cognitive clinical interview and exploration of how it has and can be used in psychological and educational research and assessment.

HUDK 4901 RESEARCH AND INDEPENDENT STUDY

Permission required.

HUDK 5020 THE DEVELOPMENT OF CREATIVITY

Major theories and contemporary research in creative work, emphasizing case studies of exceptional and historically influential individuals.

HUDK 5023 COGNITIVE DEVELOPMENT

Theory and research on the development of cognitive processes across the lifespan.

HUDK 5024 LANGUAGE DEVELOPMENT

Survey of research and theory in the development of language, beginning with communication and the origins of language in infancy and emphasizing acquisition of the forms of language in relation to their content and use.

HUDK 5027 MORAL DEVELOPMENT

Investigation of the major theoretical and empirical approaches to the study of how morality develops with particular emphasis on the behaviorist, cognitive, psychoanalytic, and sociopolitical approaches.

HUDK 5028 SPIRITUAL DEVELOPMENT ACROSS THE LIFESPAN

This course concentrates on the role of spirituality on human development using a multidisciplinary focus. Spiritual traditions are examined using stage theory and parallel theories from other fields.

HUDK 5029 PERSONALITY DEVELOPMENT AND SOCIALIZATION ACROSS THE LIFESPAN

Theory and research regarding the interaction between naturally developing personality structures and socialization processes throughout life.

HUDK 5040 DEVELOPMENT AND PSYCHOPATHOLOGY: ATYPICAL CONTEXTS AND POPULATIONS

Using contemporary research as the basis, the focus is on the interface between classical developmental psychology theories and patterns of development identified in atypical contexts (e.g., poverty) and among atypical populations (e.g., resilient youth). Implications for interventions and policy are also discussed.

HUDK 5121 CHILDREN'S SOCIAL AND EMOTIONAL DEVELOPMENT IN CONTEXT

Prerequisite: HUDK 4022 or equivalent. Contemporary theory and research on children adaptation to developmental tasks of childhood. Comparison of typical and atypical pathways in social-personality development. Analysis of the logic and method of empirical studies of development.

HUDK 5125 CROSS-CULTURAL PSYCHOLOGY

Survey of psychological studies of development in different cultures, with emphasis on perceptual and cognitive issues and methodological problems specific to cross-cultural research.

HUDK 5324 RESEARCH WORK PRACTICUM

Students learn research skills by participating actively in an ongoing faculty research project.

HUDK 6036 CHILD AND FAMILY POLICY I

Provides a multi-disciplinary perspective on child and family policy. Also provides a foundation of knowledge concerning the role of child and family perspectives in informing policy.

HUDK 6037 CHILD AND FAMILY POLICY II

Prerequisites: Any two of the following: HUDF 4000; HUDF 4024; HUDK 4021; HUDK 4022; C&T 4113; C&T 5113. Provides a multi-disciplinary perspective on child and family policy. Also provides a foundation of knowledge concerning the role of child and family perspectives in informing policy.

HUDK 6520 SEMINAR IN SOCIAL AND EMOTIONAL DEVELOPMENT THROUGH CHILDHOOD AND ADOLESCENCE

Permission required. How people become socialized and how psychology deals with the process in terms of developmental concepts.

HUDK 6523 SEMINAR IN COGNITIVE DEVELOPMENT

Permission required. Advanced topics in research and theory in cognitive development.

HUDK 6529 SEMINAR IN RISK, RESILIENCE AND DEVELOPMENTAL PSYCHOLOGY

Permission required. Students participate in ongoing research.

HUDK 6901 ADVANCED RESEARCH AND INDEPENDENT STUDY

Permission required.

HUDK 7501 DISSERTATION SEMINAR

Permission required. Development of doctoral dissertations and presentation of plans for approval. Registration limited to two terms.

HUDK 8900 DISSERTATION ADVISEMENT - DEVELOPMENTAL PSYCHOLOGY

Individual advisement on doctoral dissertation. Fee to equal 3 points at current tuition rate for each term. See the section on Continuous Registration for Ed.D./Ph.D. degrees for details.

Measurement, Evaluation, and Statistics

Department of - Human Development

Contact Information

Phone: (212) 678 4150

Fax: (212) 678 3837

Email: johnson@tc.edu; decarlo@tc.edu

Program Description

The Measurement, Evaluation and Statistics area of study includes the following programs: Applied Statistics; and Measurement and Evaluation.

The **M.S. in Applied Statistics** (32 points) requires at least one year of study. This master's degree provides training for a number of positions in applied research settings, testing organizations, and business organizations. In addition to the satisfactory completion of coursework, an integrative project is required.

The **Ed.M. in Measurement and Evaluation** (60 points) is a two-year master's degree. It provides training for a number of positions in educational research bureaus and testing organizations. In addition to the satisfactory completion of coursework, an integrative project is required for the master's degree.

The **Ed.D. and Ph.D. programs in Measurement and Evaluation** are designed to prepare graduates for careers in a wide range of educational settings. Graduates acquire specialized knowledge and skills in test theory, test and instrument development and validation, program evaluation, and quantitative analysis of educational and psychological data. Some graduates pursue careers as college professors teaching measurement, evaluation, and statistics. Some are employed in city or state departments of education in the planning and supervision of testing programs and research and evaluation projects. Others work for test publishers, licensure and certification boards, and government agencies in the construction of tests or in the management of large-scale testing programs. Still others work in applied measurement, evaluation, research design, and statistics in a variety of social science, health care, business, and industrial settings.

A doctorate is required for most college teaching positions and for positions of professional responsibility in testing organizations, departments of education, and licensure and certification boards. The **Ph.D.** (75 points) is appropriate for individuals with strong quantitative and technical skills who wish to focus on theoretical issues in measurement and evaluation or who have a strong background in a substantive area of psychology in which they wish to further the development and application of measurement techniques.

The **Ed.D.** (90 points) is appropriate for individuals who wish to focus on the application of measurement and evaluation techniques in education, psychology, and business and industry. Both doctoral degrees are accepted as qualification for faculty positions in schools of education in the United States.

Degree Summary

APPLIED STATISTICS (STAT)

- Master of Science (M.S.)

MEASUREMENT AND EVALUATION (MEAS)

- Master of Education (Ed.M.)
- Doctor of Education (Ed.D.)
- Doctor of Philosophy (Ph.D.)

For a complete listing of degree requirements, please continue on to this program's "Degrees" section in this document

Degree Requirements

Master of Science - 32 points

Applied Statistics Core Courses (27 points):

The following courses are required (in special circumstances, substitute courses may be approved by an advisor.):

- Course work in Mathematics Education on math for behavioral sciences (3)
- HUDM 4125 Statistical inference (3)
- HUDM 5126 Linear models and regression analysis (3)*
- HUDM 6026 Computational statistics (3)
- and at least one of:**
- HUDM 5123 Linear models and experimental design (3)
- HUDM 6030 Multilevel and longitudinal data analysis (3)
- and at least one of:**
- HUDM 6055 Latent structure analysis (3)
- HUDM 6122 Multivariate analysis (3)

*Under special circumstances HUDM 5122 may be substituted for HUDM 5126; advisor approval is required.

Other advanced statistics courses offered by the program or by other departments/schools of Columbia University may be selected, in consultation with an advisor, to complete the 27-point requirement. Examples of candidate courses include: HUDM 5059, HUDM 5124, HUDM 5130, and HUDM 5133.

Electives (5 points):

Selected in consultation with an advisor and within the areas of management science, economics, public health, computer science, psychology, sociology, or research methods in any general area.

Breadth Requirement (4-6 points):

At least two courses (for a minimum of 2 points each) must be taken at Teachers College from outside the program in Measurement, Evaluation, and Applied Statistics. Note: A Mathematics Education course satisfies one of the two required breadth courses.

Culminating Experience:

A special project that is conducted in consultation with an advisor. Please contact Chanel Harry (ch3196@tc.columbia.edu) for more information.

Transfer Credit:

For the M.S. degree, no transfer credit is granted for work completed at other universities.

Master of Education - 60 points

Measurement and Evaluation Core Courses (12 points):

- HUDM 5059 Psychological measurement (3)
- HUDM 6051-6052 Psychometric theory I and II (3 each)
- HUDM 6055 Latent structure analysis (3)

And at least 6 points selected from the following:

- T6416 Program evaluation in social services (3) at School of Social Work
- P8582 Program evaluation design for health policy and management (3) at Mailman School of Public Health
- P8640 Methods in program evaluation (3) at Mailman School of Public Health
- P8705 Evaluation of health programs (3) at Mailman School of Public Health

Quantitative Methods (15 points):

- HU DM 4122 Probability and statistical inference (3)*
- HU DM 5122 Applied regression analysis (3)*
- HU DM 5123 Linear models and experimental design (3)
- HU DM 6030 Multilevel and longitudinal data analysis (3)
- HU DM 6122 Multivariate analysis (3)

*HU DM 4125 may be substituted for HU DM 4122 and HU DM 5126 may be substituted for HU DM 5122.

Psychology (12 points):

Courses are taken in one or more of the following areas: developmental psychology, cognitive studies, counseling psychology, organizational psychology, or social psychology.

Research Methods (6 points):

- HU D 4120 Methods of empirical research (3)
- HU DM 5250 Research practicum in measurement and evaluation (0-4)

Other Aspects in Education (6 - 9 points):

One course in foundations of education and two courses in curriculum and teaching and/or educational leadership, chosen in consultation with an advisor.

Electives:

Chosen in consultation with an advisor and designed to strengthen and broaden the student's professional preparation.

Culminating Experience:

A project that is conducted in consultation with an advisor.

Transfer Credit:

For the Ed.M. degree, a maximum of 30 points of graduate credit may be transferred from other institutions. Only completed graduate courses with earned grades of B or higher will be considered for transfer credit. For more information, please speak with the Transfer Credit Coordinator in the Office of the Registrar.

Satisfactory Progress:

Students are expected to make satisfactory progress towards the completion of degree requirements. If satisfactory progress is not maintained, a student may be dismissed from the program. Where there are concerns about satisfactory progress, students will be informed by the program faculty.

Doctor of Education - 90 points

Measurement and Evaluation Core Courses (18 points):

- HU DM 5059 Psychological measurement (3)
- HU DM 5250 Research practicum in measurement and evaluation (0-4)
- HU DM 6030 Multilevel and longitudinal analysis (3)
- HU DM 6051-6052 Psychometric theory I and II (3 each)

- HUDM 6055 Latent structure analysis (3)

And a minimum of 9 points selected from the following:

- HUDM 5058 Choice and decision making (3)

With at least one evaluation course selected from the following:

- T6416 Program evaluation in social services (3) at School of Social Work
- P8582 Program evaluation design for health policy and management (3) at Mailman School of Public Health
- P8640 Methods in program evaluation (3) at Mailman School of Public Health
- Evaluation of health programs (3) at Mailman School of Public Health

Quantitative Methods and Research Design (27 points):

- HUDM 4122 Probability and statistical inference (3)*
- HUDM 5122 Applied regression analysis (3)*
- HUDM 5123 Linear models and experimental design (3)
- HUDM 5124 Multidimensional scaling and clustering (3)
- HUDM 6026 Computational statistics (3)
- HUDM 6122 Multivariate analysis (3)
- HUDM 7500 Dissertation seminar (1-3 points each for two semesters)
- P8120 Analysis of categorical data (3) at Mailman School of Public Health
- P8121 Generalized linear models (3) at Mailman School of Public Health
- W4640 Bayesian statistics (3) offered by the Statistics Program at CU
- HUDM 8900 Dissertation advisement (0)

*HUDM 4125 may be substituted for HUDM 4122 and HUDM 5126 may be substituted for HUDM 5122.

Psychology (minimum of 18 points):

A group of courses aimed at substantive preparation in the field of psychology. Please consult with an advisor before selecting courses.

Related Courses (minimum of 6 points):

Selected from the areas of curriculum development, guidance, applied human development, supervision, and administration.

Electives (maximum of 10 points):

Selected to meet special interests and needs.

Special Requirements:

The first two years require full-time study. In addition to the above coursework, an approved certification paper, successful performance on the certification examination, and completion of an approved doctoral dissertation are also required.

Transfer Credits:

A maximum of 45 points may be transferred from other graduate institutions for the Ed.D. degree. Only completed courses with earned grades of B or higher will be considered for transfer credit. For more information, please contact the Transfer Credit Coordinator in the Registrar's Office.

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. Where there are concerns about satisfactory progress, students will be informed by the program faculty.

Doctor of Philosophy - 75 points

Measurement and Evaluation Core Courses (21 points):

- HUDM 5059 Psychological measurement (3)
- HUDM 5124 Multidimensional scaling and clustering (3)
- HUDM 5250 Research practicum in measurement and evaluation (0-4)
- HUDM 6030 Multilevel and longitudinal data analysis (3)
- HUDM 6051-6052 Psychometric theory I and II (3 each)
- HUDM 6055 Latent structure analysis (3)

And at least 3 points selected from the following:

- HUDM 5058 Choice and decision making (3)

Quantitative Methods and Research Design (29 points):

- HUDM 4125 Statistical inference (3)
- HUDM 5123 Linear models and experimental design (3)
- HUDM 5126 Linear models and regression analysis (3)
- HUDM 5123 Linear models and experimental design (3)
- HUDM 6026 Computational statistics (3)
- HUDM 6122 Multivariate analysis (3 each)
- HUDM 7500 Dissertation seminar (1-3 points each for two semesters)
- HUDM 8900 Dissertation advisement (0)
- P8120 Analysis of categorical data (3) at Mailman School of Public Health
- P8121 Generalized linear models (3) at Mailman School of Public Health
- W4640 Bayesian statistics (3) offered by the Statistics Program at CU

Psychology (minimum of 15 points):

A group of courses aimed at substantive preparation in the field of psychology. Please consult with an advisor before selecting courses.

Non-department Requirement (7 points):

Courses in the social sciences, curriculum and teaching, and educational leadership selected in consultation with an advisor.

Special Requirements:

The first two years require full-time study. In addition to the above coursework, an approved empirical paper, an approved research paper, successful performance on the certification examination, and completion of an approved doctoral dissertation are required for the Ph.D.

M. Phil. Degree:

The M.Phil. is an *en passant* degree awarded to those nearing the completion of the Ph.D. degree. Students wishing to file for the M. Phil. should speak with their academic advisor. Please visit the Office of Doctoral Studies for more information.

Transfer Credit:

Students may transfer a maximum of 30 points from institutions other than Teachers College and Columbia University affiliated graduate programs. A maximum of 45 points of relevant coursework completed at TC or in another Faculty of Columbia University may be transferred for the Ph.D. Please contact the Transfer Coordinator in the Registrar's Office for more information.

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. Where there are concerns about satisfactory progress, students will be informed by the program faculty.

Application Information

Applied Statistics

GRE General Test is required for the M.S. in Applied Statistics. Background in calculus is also required.

Measurement and Evaluation

GRE General Test is required for all programs in Measurement and Evaluation. Some preparation in college-level mathematics or statistics coursework is required for doctoral study

Faculty List

Faculty

JAMES E CORTER ([HTTP://TC.EDU/FACULTY/JEC34](http://tc.edu/faculty/jec34))
Professor of Statistics and Education

LAWRENCE DeCARLO
([HTTP://TC.EDU/FACULTY/LD208](http://tc.edu/faculty/ld208))
Professor of Psychology and Education

MATTHEW S. JOHNSON
([HTTP://TC.EDU/FACULTY/MSJ2119](http://tc.edu/faculty/msj2119))
Associate Professor of Statistics and Education

BRYAN SEAN KELLER
([HTTP://TC.EDU/FACULTY/BSK2131](http://tc.edu/faculty/bsk2131))
Assistant Professor of Applied Statistics

YOUNG-SUN LEE ([HTTP://TC.EDU/FACULTY/SLY2003](http://tc.edu/faculty/sly2003))
Associate Professor of Psychology and Education

LAURA ELIZABETH TIPTON
([HTTP://TC.EDU/FACULTY/LET2119](http://tc.edu/faculty/let2119))
Assistant Professor of Applied Statistics

Adjunct

MICHAEL JEFFREY DEAN
([HTTP://TC.EDU/FACULTY/MJD44](http://tc.edu/faculty/mjd44))
Adjunct Assistant Professor of Education

DORIS CHEN ZAHNER
([HTTP://TC.EDU/FACULTY/DWC14](http://tc.edu/faculty/dwc14))
Adjunct Assistant Professor of Psychology and Education

Course List

HUD 4120 METHODS OF EMPIRICAL RESEARCH

An introduction to the methods of scientific inquiry, research planning, and techniques of making observations and analyzing and presenting data.

HUDM 4050 INTRODUCTION TO MEASUREMENT

An introduction to basic concepts and issues in measurement. Descriptive statistics, scales of measurement, norms, reliability, validity. Advantages and limitations of measurement techniques are discussed and illustrated.

HUDM 4120 BASIC CONCEPTS IN STATISTICS

Descriptive statistics including organizing, summarizing, reporting, and interpreting data. Understanding relationships expressed by cross-tabulation, breakdown, and scatterdiagrams. Designed as a one-semester introduction to statistical methods. Will include reading journal articles.

HUDM 4122 PROBABILITY AND STATISTICAL INFERENCE

Elementary probability theory; random variables and probability distributions; sampling distributions; estimation theory and hypothesis testing using binomial, normal, T, chi square, and F distributions.

HUDM 4901 RESEARCH AND INDEPENDENT STUDY: MEASUREMENT AND EVALUATION

Permission required.

HUDM 4902 RESEARCH AND INDEPENDENT STUDY: APPLIED STATISTICS

Permission required.

HUDM 5058 CHOICE AND DECISION MAKING

Prerequisite: HUDM 4122 or equivalent. Surveys quantitative models of individual decision making, from the introduction of the notion of "utility" by Daniel Bernoulli through current models such as Tversky and Kahneman's "Prospect Theory." The focus is on psychological or descriptive models of how people make decisions, although methods of rational decision analysis are briefly discussed.

HUDM 5059 PSYCHOLOGICAL MEASUREMENT

A previous course in statistics or measurement is recommended. An in-depth examination of measurement and associated techniques, norms, classical test theory, reliability, validity, item response theory, issues, and applications. Open to doctoral students and Ed.M students in psychology; others only by permission.

HUDM 5122 APPLIED REGRESSION ANALYSIS

Least squares estimation theory. Traditional simple and multiple regression models and polynomial regression models, with grouping variables including one-way ANOVA, two-way ANOVA, and analysis of covariance. Lab devoted to applications of SPSS regression program.

HUDM 5123 LINEAR MODELS AND EXPERIMENTAL DESIGN

Analysis of variance models including within subject designs, mixed models, blocking, Latin Square, path analysis, and models with categorical dependent variables. Lab devoted to computer applications.

HUDM 5124 MULTIDIMENSIONAL SCALING AND CLUSTERING

Permission required. Prerequisites: HUDM 4122 and HUDM 5122 or equivalent. Methods of analyzing proximity data (similarities, correlations, etc.), including multidimensional scaling, which represents similarities among items by plotting the items into a geometric space, and cluster analysis for grouping items.

HUDM 5250 RESEARCH PRACTICUM IN MEASUREMENT AND EVALUATION

Permission required. Students enrolled are expected to spend a semester involved in a research project, either assisting a faculty member or in an applied setting. A formal report will be submitted.

HUDM 6026 COMPUTATIONAL STATISTICS

Prerequisite: HUDM 4125 and either HUDM 5122 or HUDM 5126. Provides an introduction to computationally intense methods in applied statistics, taught in R. Topics include methods of evaluating statistical estimators; design, implementation, and reporting of Monte Carlo simulation studies; resampling and reordering methods; and nonparametric and data mining approaches to regression.

HUDM 6030 MULTILEVEL LONGITUDINAL DATA ANALYSIS

Prerequisite: HUDM 5122. Multilevel models include a broad range of models called by various names, such as random effects models, multi-level models, and growth curve models. This course introduces the background and computer skills needed to understand and utilize these models.

HUDM 6051 INTERMEDIATE PSYCHOMETRICS

Permission required. Prerequisites: HUDM 5059, HUDM 5122, or equivalents. Psychometric theory underlying test construction; classical test theory, item response theory, and applications.

HUDM 6052 PSYCHOMETRIC THEORY II

Permission required. Prerequisites: HUDM 5059, HUDM 5122, or equivalents. Psychometric theory underlying test construction; classical test theory, item response theory, and applications.

HUDM 6055 LATENT STRUCTURE ANALYSIS

Permission required. Prerequisite: HUDM 5122. Recommended: HUDM 6122. Study of latent structure analysis, including measurement models for latent traits and latent classes, path analysis, factor analysis, structural equations, and categorical data analysis.

HUDM 6122 MULTIVARIATE ANALYSIS I

Prerequisite: HUDM 5122 or HUDM 5126; HUDM 5123 is recommended. An introduction to multivariate statistical analysis, including matrix algebra, general linear hypothesis and application, profile analysis, principal components analysis, discriminant analysis, and classification methods.

HUDM 6900 ADVANCED RESEARCH AND INDEPENDENT STUDY

Permission required.

HUDM 7500 DISSERTATION SEMINAR

Permission required. Development of doctoral dissertations and presentation of plans for approval. Registration limited to two terms.

HUDM 8900 DISSERTATION ADVISEMENT

Individual advisement on doctoral dissertation. Fee to equal 3 points at current tuition rate for each term. See section in catalog on Continuous Registration for Ed.D./ Ph.D. degrees.

Learning Analytics

Department of - Human Development

Contact Information

Phone: (212) 678-3882

Email: hud1@tc.columbia.edu

Director: Ryan Baker

Program Description

Studying with a faculty of internationally recognized experts, students in the Master of Science in Learning Analytics program work with real-world data collected from massive open online courses (MOOCs) and other educational domains. The degree requires 32 credits of coursework on learning analytics methods, tools, and theory, as well as key background in related areas such as cognition, educational theory, and statistics and measurement. Students are also required to complete an integrative project in which they apply data analytics to real-world large-scale educational data sets.

Degree Summary

Master of Science (32-Credits)

For a complete listing of degree requirements, please continue on to this program's "Degrees" section in this document

Degree Requirements

Masters of Science (32-credits)

Program Core Courses:

- HUDK 4050: Core Methods in Educational Data Mining
- HUDK 4051: Learning Analytics: Process and Theory
- HUDK 4052: Normative Perspectives on the Analysis of Learners and Learning
- HUDK 4054: Managing Educational Data
- HUDK 5053: Feature Engineering Studio

Additional Core Courses:

- HUDK 4029: Human Cognition and Learning
- HUDK 5030: Visual Explanations
- HUDM 5124: Multidimensional Scaling and Clustering

Measurement:

- HUDM 4050 Introduction to measurement
OR
- HUDM 5059 Psychological Measurement

Capstone Project:

Students will complete an integrative capstone project, involving conducting analytics on real-world educational data to solve a real-world problem or answer a real-world question.

In addition, a minimum of two additional Teachers College courses outside of HUDK are selected in consultation with an advisor. Some potential courses include:

- HUDM 5123 Linear Models and Experimental Design
- HUDM 5133 Causal Inference for Program Evaluation
- ITSF 4010 Cultural and social bases of education
- MSTU 4001 Technology and School Change
- MSTU 4020 Social and Communicative Aspects of the Internet and other ICTs
- MSTU 4022 Telecommunications, distance learning, and collaborative interchange
- MSTU 4036 Hypermedia and education
- MSTU 4037 Computers and the uses of information in education
- MSTU 4039 Video games in education
- MSTU 4052 Computers, problem solving, and cooperative learning
- MSTU 4083 Instructional design of educational technology
- MSTU 4085 New technologies for learning
- MSTU 4133 Cognition and computers
- MSTU 5001 Assessing the impact of technology in our schools
- MSTU 5005 Case-based Teaching and Learning in Electronic Environments
- MSTU 5030 Intelligent computer-assisted instruction
- MSTU 5035 Technology and Metacognition
- ORLA 6641 Advanced topics in research methods and design

Faculty List

Faculty

RYAN S. BAKER ([HTTP://TC.EDU/FACULTY/RSB2162](http://tc.edu/faculty/rsb2162))

Associate Professor of Cognitive Studies

JOHN B BLACK ([HTTP://TC.EDU/FACULTY/JBB21](http://tc.edu/faculty/jbb21))

Cleveland E. Dodge Professor of Telecommunications
& Ed.

JAMES E CORTER ([HTTP://TC.EDU/FACULTY/JEC34](http://tc.edu/faculty/jec34))

Professor of Statistics and Education

GARY J NATRIELLO ([HTTP://TC.EDU/FACULTY/GJN6](http://tc.edu/faculty/gjn6))

Ruth L. Gottesman Prof. in Educ. Research

BARBARA TVERSKY ([HTTP://TC.EDU/FACULTY/BT2158](http://tc.edu/faculty/bt2158))

Professor of Psychology and Education

Course List

HUDK 4050 CORE METHODS IN EDUCATIONAL DATA MINING

Prerequisite: HUDM 5122 or equivalent, or approved statistics or computer science data mining course. Methods of educational data mining focused on automated discovery of patterns in large-scale educational data, execution of methods in standard software packages, limitations of existing implementations of methods, and when and why to use these methods. Discussion of how EDM uses some of the same mathematical frameworks as traditional statistics and how their use in EDM differs.

HUDK 4051 LEARNING ANALYTICS: PROCESS AND THEORY

Prerequisite: Course in statistics is recommended. Framework for understanding the emerging field of learning analytics. Examines primary perspectives on what the field should be, including educational data mining, learning analytics and big data perspectives, and relationships to related and existing fields. Includes perspectives on philosophy and theory of design and inquiry, validity of a learning analytics analysis or model, and challenges to its effectiveness and appropriate use.

HUDK 4052 NORMATIVE PERSPECTIVES ON THE ANALYSIS OF LEARNING AND LEARNERS

Introduction to multiple perspectives on activities connected to progress in our capacity to examine learning and learners, represented by the rise of learning analytics. Students develop strategies for framing and responding to the ranges of values-laden opportunities and dilemmas presented to research, policy, and practice communities as a result of the increasing capacity to monitor learning and learners.

HUDK 4054 MANAGING EDUCATION DATA

Attaining, compiling, analyzing, and reporting data for academic research. Includes data definitions, forms, and descriptions; data and the research lifecycle; data and public policies; and data preservation practices, policies, and costs.

HUDK 5030 VISUAL EXPLANATIONS

Surveys production and comprehension of visualizations ranging from ancient cave paintings and petroglyphs to diagrams, charts, graphs, comics, picture books, photographs, gesture, and film to extract and apply techniques for conveying objects, actions, forces relations, and emotions, meanings that are both inherently visible and non-visible. Implications for education, art, media, and HCI are drawn.

HUDK 5053 FEATURE ENGINEERING STUDIO

Prerequisite: HUDK 4050. Design studio-style course covers the process of feature engineering and distillation, including brainstorming features, deciding what features to create, and criteria for selecting features for data mining. Students learn how to create features in Excel, Java, Google Refine, EDM Workbench, and other relevant tools.