Biobehavioral Sciences

Teachers College
COLUMBIA UNIVERSITY

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Program in Motor Learning and Control
Department of Biobehavioral Sciences

MA Program Handbook
2025-26

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Program Overview

The Master of Arts (M.A.) program in Motor Learning & Control (Major Code: MTLG) is a program within Movement Sciences and Education in the Department of Biobehavioral Sciences (BBS). The program is designed to provide students with a broad background in movement sciences and related areas, including motor learning and control. Students with any undergraduate major will be considered. The program provides content relevant to students from a range of applied areas, including dance, Pilates, yoga, movement practitioners (e.g. Feldenkrais Method, Alexander technique), physical and occupational therapists, coaches, and trainers. Students can use this degree to advance their professional practice or to use as a stepping stone for subsequent application to medical, physical therapy, or occupational therapy schools, or doctoral study in kinesiology or rehabilitation sciences.

Study focuses on the behavioral, biomechanical, and neural bases of development, acquisition, and performance of functional movement skills. Acquisition of skill is examined over the life span in typically developing children and adults and individuals with movement disorders. Movement analysis is used to elucidate the neuromotor control processes underlying skilled performance in everyday functional behaviors. The practitioner's role in facilitating skill learning and performance is emphasized.

The M.A. program emphasizes bridging between the movement sciences and clinical or educational practice. The objective is to develop a comprehensive and coherent view of theory and research that can be applied to practice within the student's professional field.

The program requires 32 points of graduate study and includes:

1. Substantive study of theory and research as embodied in lecture and laboratory courses.
2. Development of clinical or educational skills in laboratory and fieldwork courses.
3. Research training to enable students to read and interpret original research and to carry out educational, clinical, or laboratory research.
4. Seminars to discuss theory and research, identification of research problems, and clinical/educational applications.
5. Elective courses to meet specific student needs which may be taken throughout Teachers College in such areas as anatomy, biology, business, computer science, health education, higher and adult education, neurosciences, nutrition, physiology, psychology, science education, and statistics.

A final project is required for the M.A. and may involve one of three options:

1. A scholarly review of research and theory within a topical area drawing application to educational or clinical practice.
2. An educational project including the development of an assessment instrument/method for clinical or educational practice or a presentation for a continuing education program.

3. A basic or applied research study under the advisement of a faculty member or advanced doctoral student (note this option is required if considering doctoral study).

For the M.A. degree, students may also, in consultation with their faculty advisor, create a flexibly designed program of study cutting across specialization areas (Motor Learning and Applied Exercise Physiology), which will meet their professional needs and academic interests. Students with diverse interests may also exchange courses for other department offerings in consult with an advisor. The M.A. program can be completed in 18 months of full-time study or two to three years of part-time study (depending on the student's other responsibilities).

Special Admission Requirements/Academic Prerequisites

While students have come from a variety of fields, the following backgrounds are most appropriate: movement sciences, exercise science, physical therapy, occupational therapy, physical education, dance, athletic training, biology, nutrition, nursing, and psychology. Students with strong academic records, who have deficiencies in their science backgrounds, may be admitted with the understanding that these deficiencies will be remedied with appropriate courses.

Students are required to complete all of the following courses with a grade of B or better. Students who earn grades B- or below will need to retake those courses and will be charged tuition again. It is recommended that prospective students communicate with an academic advisor to discuss program plans prior to admission. Students are encouraged to make an appointment to visit the college for at least half a day to meet with faculty and current students, to audit a course or seminar, and to become acquainted with research areas and resources. Applicants are reviewed on an ongoing basis throughout the academic year. Prior to formal admission, enrollment in up to 8 points of study as a non-matriculated student is permitted.

Course Work Requirements

<u>Core Coursework (23 Credits)</u>

BBS	5060	Neuromuscular response and adaptation to exercise (2 points)
BBS	5068	Brain and Behavior I: Communication in the nervous system (2 points)
BBSR	5055	Bases of motor control systems (3 points)
BBSR	5582	Research design in the movement sciences (3 points)
BBSR	4060	Motor learning (3 points)
BBSR	4161	Motor learning laboratory (2 points with *co-requisite BBSR 4060*)
BBSR	5028	Motor development across the lifespan (3 points)

BBSR 4050 Biomechanical analysis of human movement (3 points)
BBSR 5504 Research training seminar (Section 002) (2 points)

Substantive Study (6 credits)

Standard Courses

BBSR 4005 Applied anatomy and biomechanics (3 points)
BBSR 4055 Neuromotor processes (3 points)
BBSR 4090 Physical fitness, weight control, and relaxation (3 points)
BBSR 4095 Applied physiology I (3 points)
BBSR 5050 Neurophysiology of motor control and electromyography (3 points)
BBSR 5057 Movement disorders (3 points)
BBSR 5095 Exercise and health (3 points)
BBSR 4070 Psychosocial Aspects of Sports and Exercise (3 points)
BBSR 5199 Conference Seminar (3 points)

Laboratory Courses

BBSR 4151 Laboratory methods in biomechanics (3 points)
BBSR 4195 Applied physiology laboratory I (3 points)
BBSR 5151 Introduction to the analysis of biomechanical signals (3 points)
BBSR 5194 Applied physiology laboratory II (3 points)
BBSR 5195 Advanced applied physiology laboratory (3 points)
HUDM 5026 Introduction to Data Analysis in R (3 points)

Elective Courses (3 credits)

Students should take 2-3 credits outside the Movement Sciences area (along with required courses BBS 5060 and BBS 5068) to meet the Teachers College breadth requirement. Please see the academic schedule and academic catalog for a full list of available courses. Popular breadth elective courses for students in Movement Sciences have included courses in Health and Behavioral Studies (HBSE), Human Development (HUDM), Neuroscience and Education (BBSN), Dance (A&HG), and Measurement and Statistics (HUDM).

Please note that courses taken at Columbia Schools outside of Teachers College cannot count toward the breadth elective requirement. It is recommended that you discuss your electives with your advisor or program faculty for assistance in selecting courses that may contribute toward your educational and career goals. Courses outside of Movement Sciences (BBSR) that you use to fulfill core degree requirements and/or research methods requirements can also count toward the breadth requirement.

Advisement

All students will be provided with academic advisement by Dr. Julie Fineman, Master's Program Coordinator. Students are required to meet with Dr. Fineman each semester to review their plan of study and confirm coursework. The first semester of registration, students will require a PIN in order to register for classes. This will be provided during their first advisement session with Dr. Fineman. Advisement for master's projects will be decided based on content area.

Research Training Requirements

BBSR 5504 (sect 002) Research training in motor learning (2). Students will enroll in this competency-based course during their last semester of study to immerse themselves in current research in motor learning and control, as well as receive advisement on their final project. Students are expected to attend monthly course meetings during each semester of their MA program but are only required to enroll in this course in their final semester. Note that if all coursework is complete but the student has not completed the final project, students must continue to enroll for 1 point (above and beyond the 32 points) each semester until the project is complete.

Work-Study and Financial Aid

Work-study positions are also available to US citizens and permanent residents who have applied for and received work-study allocations. Financial aid is also available, and students are encouraged to indicate being considered for financial aid on their applications. For more information, contact the Teachers College Office of Financial Aid.

Research & Teaching Assistant Positions

We have a limited number of Research Assistant (RA) and Teaching Assistant (TA) positions available in the BBS Department. To inquire about current RA positions, please contact individual faculty to identify what positions are available. TA positions are typically reserved for advanced master's or doctoral students, but other students with expertise in an area may be considered.

Additional Information

Additional information about the program and labs can be found on our website:
https://www.tc.columbia.edu/biobehavioral-sciences/motor-learning-and-control/

A description of the above courses can be found at
http://www.tc.columbia.edu/biobehavioral-sciences/movement-science-and-education/academics/courses-offered/

Additional BBSR and other courses can be found in the Teachers College Academic Catalogue at - http://www.tc.columbia.edu/catalog/

Additional information about Financial Aid can be found here: https://www.tc.columbia.edu/admission/financial-aid/

For international students, please visit our International Students Website: https://www.tc.columbia.edu/international/

Sample Program Plan – Full time

Semester: Fall I

Course #	Name	Type	Points
BBSR 4060	Motor learning	Required/Core	3
BBSR 4161	Motor learning lab (corequisite of BBSR 4060)	Required/Core	2
BBSR 5582	Research design in movement sciences	Required/Core	3
BBSR 4050	Biomechanical analysis of human movement	Required/Core	3
		Total	**11**

		Credits	

Semester: Spring I

Course #	Name	Type	Points
BBS 5068	Brain and Behavior I	Required/Core/Elective	2
BBS 5060	Neuromuscular response and adaptation to exercise	Required/Core/Elective	2
BBSR 5055	Bases of Motor Control	Required/Core/Elective	3
BBSR 5028	Motor Development across the life span	Required/Sub	3
	Elective	Elective	3
		Total Credits	**13**

Semester: Summer I

BBSR 4151	Laboratory methods in biomechanics	Option/Laboratory	3
BBSR 5151	Introduction to Analysis of Biomechanical Signals	Option/Laboratory	3
		Total Credits	**3**

Semester: Fall II

Course #	Name	Type	Points
BBSR 5504 (02)	Research training seminar	Seminar	2
BBSR 5057	Movement Disorders	Option/Substantive Study	3
		Total Credits	**5**

Program Total	**32**

Sample Program Plan – Part-time

Semester: Fall I

Course #	Name	Type	Points
BBSR 4060	Motor learning	Required/Core	3

BBSR 4161	Motor learning lab (corequisite of BBSR 4060)	Required/Core	2
		Total Credits	**5**

Semester: Spring I

Course #	Name	Type	Points
BBS 5068	Brain and Behavior I	Required/Core/Elective	2
BBS 5060	Neuromuscular response and adaptation to exercise	Required/Core/Elective	2
BBSR 5028	Motor development across the life span	Required/Sub	3
		Total Credits	**7**

Semester: Summer I

	Out of Department Elective	Elective	3
		Total Credits	**3**

Semester: Fall II

Course #	Name	Type	Points
BBSR 5582	Research design in movement sciences	Required/Core	3
BBSR 4050	Biomechanical analysis of human movement	Required/Core	3
		Total Credits	**6**

Semester: Spring II

BBSR 5055	Bases of Motor Control	Required/Core/Elective	3
BBS 5060	Neuromuscular response and adaptation to exercise	Required/Core/Elective	(2)
		Total Credits	**3**

Semester: Summer II

BBSR 4151	Laboratory methods in biomechanics	Option/Laboratory	3
BBSR 5151	Introduction to Analysis of Biomechanical Signals	Option/Laboratory	3

		Total Credits	**3**

Semester: Fall III

BBSR 5504 (02)	Research training seminar	Seminar	2
BBSR 5057	Movement Disorders	Option/Substantive Study	3
		Total Credits	**5**

Program Total	**32**

Final Project

1. Types of MA Projects

As part of the requirements for completion of the Master of Arts (MA) degree, you must complete a master's (MA) project. Three options for fulfilling this requirement are available.

1.1 **Literature Review**

The goal of this project is to review research and theory in motor learning related to a specific problem encountered in clinical or educational practice or across research specialization areas. The review paper aims to apply theory to practice or to generate testable hypotheses having relevance to educational or clinical practice. Alternatively, the review paper can cover a narrowly defined topic in motor learning and control by integrating research literature across neuromotor, biomechanical, and behavioral levels of inquiry. A minimum of one semester is usually needed to complete this type of project.

1.2 Basic or Applied Research Project

A basic or applied research project requires the completion of a single case study, pilot study, or full experimental study (e.g., in conjunction with a doctoral student's work).
A pilot study or full experimental study is suggested to those students considering continuing on to the EdM, EdD, or Ph.D. programs. A minimum of two semesters is usually needed to complete this type of project.

1.3 Educational Project

An educational project may include the development of an instruction tool to be utilized in educational or clinical practice (e.g., DVD-video, web-based instruction) or a presentation for a continuing education program. A minimum of one semester is usually needed to complete this type of project.

2. Advisement

Regardless of the type of project, it is suggested that you discuss your preliminary ideas with the Master's Program Coordinator as early as possible, but no later than the semester prior to the last semester of studies. You may also seek advice from the Master's Program Coordinator in the selection of a suitable topic.

Subsequently, if you plan to conduct a basic or applied research project, in consultation with the Master's Program Coordinator, you may approach a faculty member, doctoral student, or suitable

person outside the College (e.g., clinician) in the research area of your project. Students who conduct a literature review or educational project will be advised by the Masters Program Coordinator or be connected with another advisor (e.g., doctor student).

3. Proposals

Prior to the start of a project, a proposal has to be written and discussed with your advisor. Typically, for literature reviews and educational projects, the proposal is completed in the semester prior to the last semester of studies. For research projects, additional time is needed. Thus, you would need to submit your proposal earlier. You can start your project as soon as your proposal is formally accepted by your advisor and (if you are not advised by the Master's Program Coordinator) by the Masters Program Coordinator. The proposal (max. 2 pages long [single-spaced], without references and/or bibliography) should cover the points below. Make subtitles where appropriate.

3.1 Literature Review Proposal

1. **Proposal** of [your name]
2. **Working title**
3. **Type of project**: Literature review
4. **Advisor**(s)
5. **Background**: Write a one-paragraph summary of the current body of knowledge in connection with your topic.
6. **Main questions of concern**
7. **Rationale**: Why do you think it is important to investigate these questions? How relevant are these questions in the clinical or educational practice?
8. **Purpose** of your paper
9. **Outline** of the contents: Main points that you plan to cover (e.g., preliminary ideas of the main sections of your paper: titles and subtitles including an estimate of the number of pages in each section)
10. **Working plan**: Provide a preliminary working plan with the major steps of your project (including a time schedule).
11. **Proposal's date**
12. **References**

3.2 Basic or Applied Research Project Proposal

1. **Proposal** of [your name]
2. **Working title**
3. **Type of project**: e.g., basic or applied research; single case study, pilot study, study
4. **Advisor**(s)
5. **Background**: Write a one-paragraph summary of the current body of knowledge in

connection with your topic and how your research will complement it

6. **Research question**(s) and/or **Purpose** of your research
7. **Rationale**: Why do you think it is important to investigate this/(these) question(s)? What contributions are you expecting from your findings – e.g., how could your findings potentially affect future therapeutic or training approaches?
8. **Hypotheses**: What outcomes do you expect - and why? State one or more hypotheses and provide some evidence-based arguments for your expectations.
9. **Methods**: How are you planning to investigate your research question?
10. **Outline** of the contents: Main points that you plan to cover (e.g., preliminary ideas of the main sections of your paper: titles and subtitles including an estimate of the number of pages in each section)
11. **Working plan**: Provide a preliminary working plan with the major steps of your project (including a time schedule). For a full experimental study, the plan includes the collection of pilot data and the experiment has to be approved by the Teachers College Institutional Review Board.
12. **Date** of the proposal
13. **References** and **Bibliography**

3.3 Educational Project Proposal

1. **Proposal** of [your name]
2. **Working title**
3. **Type of project**: Educational project
4. **Advisor**(s)
5. **Background:** Write a one-paragraph summary of the current body of knowledge in connection with your topic.
6. **Main questions of concern**
7. **Rationale**:Why do you think it is important to investigate these questions? How
8. relevant are these questions in clinical or educational practice?
9. **Purpose** of your project
10. **Methods:** Depending upon the type of project (assessment instrument/method for clinical or educational practice or presentation for a continuing education program) describe the methods that you are planning to use. In presentations for a continuing education program, this part includes a description of the addressees and presentation format.
11. **Outline of the contents**: Main points that you plan to cover (e.g., preliminary ideas of the main sections of your presentation: titles and subtitles including an estimate of the number of slides per section).
12. **Working plan**: Provide a preliminary working plan with the major steps of your project (with a time schedule including the date of the presentation).While it is expected that the presentation actually be given, for the purpose of formal acceptance of the

project, submitting the finalized version is sufficient.

13. **References**

4. <u>Format of the MA Project</u>

The format of all papers must follow APA style. All papers must include an abstract (maximum one page long) and an introduction. The papers have numbered pages, are written in a double-spaced text format, and have a title page. Furthermore, the papers have to meet the following specific requirements:

- A literature review must be at least 15 pages and no longer than 20 pages in length (not including the abstract, figures, tables, and references).

- A basic or applied research project require a paper to be written in the format of a research study (introduction 2-3 pages, methods 3-4 pages, results 2-4 pages, discussion 3-5 pages).

- An educational project, consisting of a presentation for a continuing education program contains: a 2-3 pages introduction, a 1-2 pages didactical plan for the presentation, copies of the slides of the PowerPoint presentation (numbered; with a maximum of 45-50 slides for a 1-hour presentation), a narrative/legend to each slide. The appendix of the paper may include handouts, an evaluation form, or any other material pertinent to the presentation.

- The format of all other educational projects depends on the type of project chosen and would be discussed with the Masters Program Coordinator.

Approval of MA Projects and Filing Deadlines for Graduation

It is very important that you plan sufficient time with your advisor for final revisions on the paper, prior to the Teachers College filing deadlines for MA projects. Your final paper has to be formally accepted by your advisor and (if you are not advised by the Master's Program Coordinator) by the Master's Program Coordinator. Upon formal acceptance of the paper and dependent upon when the project is accomplished, the advisor and (if you are not advised by the Master's Program Coordinator) the Masters Program Coordinator will approve your final project.

Degree Application Due	**MA Project Approval Deadline**	**Date of Degree Award**
August 1	September 1	October
November 1	January 2	February
February 1	April 30	May

Teachers College and Program Policies

Teachers College Diversity Mission Statement
To establish Teachers College as an institution that actively attracts, supports and retains diverse students, faculty and staff at all levels, demonstrated through its commitment to social justice, its respectful and vibrant community and its encouragement and support of each individual in the achievement of his or her full potential.

Transfer Credit
No transfer credits may be accepted for the Master of Arts program.

Satisfactory Progress
Students are expected to make satisfactory progress toward the completion of degree requirements. Program faculty will review each student's progress annually. Please note that satisfactory performance in the Motor Learning program is defined as: no incomplete grades, and no core required courses in which the grade earned is lower than B. Grades of B- or below in any core required course will result in retaking of the course. Any student receiving 8 or more points in grades of C- or lower is not permitted to continue registration at the College in any capacity and may not receive a degree or diploma. Petitions for exception to this policy are to be submitted, in writing, to the Registrar with a written recommendation from the department in which the student was last enrolled. Such petitions will be submitted to a faculty committee for review and decision.

Where there are concerns about satisfactory progress, students will be informed by the program faculty. If a student is performing below expectations, he/she may be required to complete additional course work. The program will provide a plan and timeline for remediation, so students know the expectation for them to continue in the program. If satisfactory progress is not maintained a student may be dismissed from the program.

Resolution of Student Academic Program Concerns
Any student who has a concern regarding an academic matter may seek assistance. The procedure for resolving academic program concerns (see note of grade correction process below) begins with either the faculty member (if the concern is related to a course) or the student's advisor. If the student is not satisfied with the response or resolution achieved at this first level, or if speaking with the faculty member presents a conflict of interest for the student, the student should proceed to speak with the Program Director in the area in which the academic concern resides. If the student is not satisfied with the response or resolution achieved through the Program Director, the student should proceed to speak with the Chair of the academic department in which the academic concern resides. If the student is still not satisfied with the response or resolution achieved through the Department Chair, or if speaking with the Department Chair presents a conflict of interest for the student, the next step is to contact the Office of the Vice Provost. At any stage of the process, students are welcome to seek the advice and guidance of the Ombudsman, who is charged with attempting to informally resolve student dissatisfaction of an academic nature on a completely confidential basis.

Grade Correction Procedure
The instructor for a course has the responsibility for setting the requirements for a course and making an evaluation of students' work. Once a grade has been given, the instructor is not free to change the grade unless the instructor indicates to the Registrar that an error was made in the original grade transmitted. If a student believes that an error has been made, he/she must take the initiative in bringing about the necessary correction prior to the conclusion of the semester immediately following the semester in which the course was taken. The normal procedure for effecting a correction would be through direct discussion between the student and the instructor. If redress cannot be attained through such discussions, the student may next appeal to the

department chairperson of the department offering the course. If resolution cannot be attained through appeal, the student may next appeal to the Vice Provost. In situations where the student feels that such an appeal process might not be in the student's interest, counsel and assistance can be sought from the Ombudsman or the Vice Provost.

Students with Disabilities
The College will make reasonable accommodations for persons with documented disabilities. Students are encouraged to contact the Office of Access and Services for Individuals with Disabilities (OASID) for information about registering with the office. You can reach OASID by email at oasid@tc.columbia.edu, stop by 163 Thorndike Hall or call 212-678-3689. Services are available only to students who are registered and submit appropriate documentation. As your instructor, I am happy to discuss specific needs with you as well.

Students' Rights & Responsibilities
The rights and responsibilities of students and other members of the Teachers College community are addressed in the annual Catalog and the Statutes of Teachers College as well as in College policies and practices. The information provided within the relevant section of the Student Handbook includes selected policies and practices, as well as outline the disciplinary procedures of the College. Students are expected to be familiar with and adhere to these policies and practices. The most current versions of Teachers College policies are available in the TC Policy Library.

Statement on Academic Conduct
Teachers College (TC or the College) expects members of the College community to observe traditional norms of scholarly discourse, academic integrity, and fairness. All members of the College community are expected to exhibit the high level of personal integrity which society must demand of professionals.

Teachers College insists on the greatest degree of freedom of inquiry, teaching, learning, and expression for all of its members. Thus activities which disrupt the regular and essential operation of the College or Columbia University are not permitted. For matters of gender-based misconduct involving students including sexual assault, domestic violence, dating violence, and stalking the Gender-Baser Misconduct Policy for Students can be found at http://sexualrespect.columbia.edu.

Students or other members of the College community may charge students with violating these standards. Students found guilty of violating these standards of conduct may be subject to appropriate disciplinary action, ranging from reprimand to disciplinary probation, suspension or expulsion. For a full statement of the policy, please visit the TC Policy Library.

Non-Discrimination Policy
Continuing its long-standing policy to support active equality for all persons, Teachers College does not discriminate on the basis of race, color, religion, creed, sex, sexual orientation, national origin, ancestry, age, marital status, citizenship status, veteran status, disability, pregnancy, gender expression or any other criterion specified by federal, state or local laws, in the administration of its admissions, employment and educational policies or scholarship, loan, athletic and other school-administered programs. Rather, Teachers College affirms that it admits students and selects employees regardless of their race, color, religion, creed, sex, sexual orientation, national origin, ancestry, age, marital status, citizenship status, veteran status, disability, pregnancy, gender expression or any other criterion specified by federal, state or local laws and thereafter accords them all the rights and privileges generally made available to students or employees at the school.

Students with concerns about the application of civil rights laws (including Title IX, the Americans with Disabilities Act, Section 504 of the Rehabilitation Act, and the Age Discrimination Act) may wish to speak with Vice Provost Katie Embree, 113 Zankel, (212) 678-3991, Vice President for Diversity and Community Affairs

Janice Robinson, 128 Zankel, (212) 678-3391, Executive Director for Equity and Section 504 Compliance Officer, Melissa Rooker, 128 Zankel, (212) 678-7508, or Ombuds Officer Erwin Flaxman,280 Grace Dodge, (212) 678-4169. Students with Title IX concerns may also contact Ombuds for Gender-Based Misconduct Riddhi Sandil, 325 Horace Mann, (212) 678-4016.
For a full statement of the policy, please visit the TC Policy Library.

Contact information

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