

BBSR4161 Motor Learning Laboratory
Teachers College Columbia University
Department of Biobehavioral Sciences
Fall 2018

Instructor: Gregory Youdan, MA

Office: 1053 Thorndike

Office Hours: Wednesday 3 – 4:40 pm, By appointment (via email)

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Class Meeting Time/Location: Wednesdays, 7:20-9:00pm, Horace Mann 140

Co-Requisite: This course is designed to be taken in conjuncture with BBSR 4060 Motor Learning

Course Description:

This is a laboratory course. The primary purpose of this course is for students to carry out small experiments using principles associated with the acquisition of functional movement skills. This course is designed to allow students hands on exploration of the selected motor learning principles and theories and their applications in clinical practice, coaching and teaching of motor skills. Classes will involve hands-on laboratory exercises; attendance is mandatory. Labs will be based on the assigned readings, as well as supplementary materials (note that not all elements of the readings will be discussed in class). Course materials, additional information and useful links will be made available in Canvas.

Course Objective:

The objective of this course to gain an understanding of the concepts and techniques required to measure and analyze Motor Learning.

Required Text & Readings

- Magill, R.A., & Anderson, D.I. (2016). *Motor learning and control: Concepts and applications* (11th ed.). New York: McGraw Hill.
- TEXTBOOK ONLINE LEARNING CENTER: <http://www.mhhe.com/magill10e>
- Additional readings and articles will be listed through **Course Reserves** for students to acquire through e-journals of the TC and Columbia libraries.

Course Requirements

All students in the Motor Learning program must be enrolled for 2 credits; in specific situations, students may enroll for 1 credit.

Graded weight for 2 credits	Graded weight for 1 credit	Assignments
10%	10%	1. Read assignments <i>prior</i> to class; attend class and actively participate in class discussions
40%	55%	2. Submit weekly typed lab reports based on in-class labs. <ul style="list-style-type: none">• Lab Reports are due the following Friday by 11:59pm (submitted on Canvas) after they are assigned.
20%	35%	4. Complete & submit Take-Home Lab (Midterm) on Canvas

30%	NA	5. Complete & submit a final project on Canvas
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Lab Reports: Every week in class we will perform a weekly hands-on laboratory. Accompanying each laboratory will be a small set of questions. You are to type up these questions and submit electronically on Canvas the following Friday by 11:59pm, unless otherwise stated. **1 Credit Students** are responsible for **10/13 lab reports** and **2 Credit Students** are responsible for **12/13 lab reports**. Lab reports 1 and 9 are mandatory for all students.

Midterm: There will be one take-home lab that is similar to the in-class laboratory classes. This lab will require observing two participants (Novice and Expert) performing a motor skill of your choice. To adapt this skill to a physical rehabilitation context, the “novice” can be a patient who is beginning rehab for a skill; the expert is a person not in therapy and can do the skill well.

Examples of skills to observe: Serving a tennis ball; batting a baseball; competitive weightlifting lift; throwing a dart; a dance step or routine; transferring from a bed to wheelchair; using a walker; ascending or descending stairs; handwriting.

Final Project (2 Credit Students): Choose a topic we have discussed in class (*Must be approved by instructor) and write a short (4-5 pages) proposal for a motor learning experiment to address the topic of your choosing. The proposal should be *concise* (not longer than 4-5 typewritten pages), yet as *detailed* (and justified) as possible. Outline (rather than paragraph) format is fine as long as you include all details. Points will be deducted for making the proposal more complicated than necessary (e.g., equipment and variables not required to answer questions). Specifically, your proposal should include:

- 1) Short literature review on topic which provides reasoning for your proposal – Background
- 2) Hypothesis – Aims & Hypothesis
- 3) Experimental Set Up and Design – Subject and Methods
- 4) Limitations - What would your data or experimental setup not be able to tell you?
- 5) Possible Implications – Give an idea of possible results and discussion of those findings

In lieu of a research study, you can submit a short (5-7 pages) proposal for incorporating one motor learning principal or topic (*Must be approved by instructor) into your current practice or coaching. You are to design a plan based in the literature aimed at increasing motor learning. Specifically, your proposal should include:

- 1) Short literature review on topic which provides reasoning for your proposal – What do we know about this topic or principle? – Background
- 2) How you plan to incorporate this principle into your current practice?
- 3) How does the research support the method of your proposed plan?

Proposed Course Schedule

The following is a tentative schedule of the labs and topics to be discussed. Slight changes may be required. Also listed below are the relevant readings.

DATE	TOPIC	LAB	READINGS & ASSIGNMENTS
Week 1: 9/5	Course overview; Requirements and introductory information	Exploration of Central Tendency & Dispersion	

DATE	TOPIC	LAB	READINGS & ASSIGNMENTS
Week 2: 9/12	Motor skill classifications; Gentile's taxonomy of tasks No In-Person Class: Lab will be completed on your own and turned in the following Friday.	Lab 1: Gentile's Taxonomy of Motor Skills (REQUIRED)	<u>Textbook:</u> Ch. 1 Gentile, A. M. (2000). Pages 111 – 134:
Week 3: 9/19	Individual differences and motor abilities	Lab 2: Individual differences and motor abilities	<u>Textbook:</u> Ch. 3
Week 4: 9/26	Bimanual Coordination	Lab 3: Bimanual Coordination	<u>Textbook:</u> Ch. 5 & Ch. 7
Week 5: 10/3	Motor control theories	Lab 4: Spontaneous Gait Transitions Location: TH1049 *Must bring athletic shoes and clothes	<u>Textbook:</u> Ch. 5 Shapiro et al. (1981).
Week 6: 10/10	Vision and motor control	Lab 5: Vision and Ball Catching/Monocular vs. Binocular	<u>Textbook:</u> Ch. 6
Week 7: 10/10	Control of functional skills	Lab 6: Fitt's Law	<u>Textbook:</u> Ch. 7 Fitts, P. (1992).
Week 8: 10/17	Attention	Lab 7: Attention Capacity Demands	<u>Textbook:</u> Ch. 9
Week 9: 10/24	Memory	Lab 8: Working Memory – Remembering Limb Movements	<u>Textbook:</u> Ch. 10
Week 10: 11/7	Novice versus Skilled	Midterm Lab: Novice Versus Skilled Midterm Due 11/16 by 11:59pm	<u>Textbook:</u> Ch. 12 Gentile, A. M. (1972).
Week 11: 11/14	Stages of Learning	Lab 9: Performance Changes During Practice (REQUIRED)	<u>Textbook:</u> Ch. 12 Gentile, A. M. (1972).
Week 12: 11/21	NO CLASS– THANKSGIVING HOLIDAY		

DATE	TOPIC	LAB	READINGS & ASSIGNMENTS
Week 13: 11/28	Transfer of learning	Lab 10: Bilateral Transfer Final Project Topic Due for 2 Credit Students	<u>Textbook</u> : Ch. 13
Week 14: 12/5	Instruction: Demonstration / Observational learning	Lab 11: Observational Learning	<u>Textbook</u> : Ch. 14
Week 14: 12/12	Augmented feedback	Lab 12: Frequency of Knowledge of Results	<u>Textbook</u> : Ch. 15
Week 15: 12/19	Practice conditions	Lab 13: Contextual Interference Effect Final Project (2 Credit students) Due 12/19 by 11:59pm	<u>Textbook</u> : Ch. 16 Lab Report 13 Due 12/21 by 11:59 pm

Late work: All assignments are due as listed, unless previous arrangements are made with the professor. Weekly lab reports submitted after the due date will not be accepted and will receive zero points. The Take Home Lab and Final Project submitted after the due date and time, will be considered late and reduced by 5 points per day.

Attendance: Points will be deducted on a case by case basis if attendance requirement is not met.

Grading:

Average	Rare	(93,100]	(90,93]	(87,90]	(83,87]	(80,83]	(75,80]	(70,75]	(65,70]	(0,65]
Grade	A+	A	A-	B+	B	B-	C+	C	C-	F

For the full text of the grading symbols approved by Teachers College Faculty please refer to <http://www.tc.columbia.edu/policylibrary/Grading>.

Communications: Teachers College students have the responsibility for activating the Columbia University Network ID (UNI) and a free TC Gmail account. As official communications from the College – e.g., information on graduation, announcements of closing due to severe storm, flu epidemic, transportation disruption, etc. – will be sent to the student’s TC Gmail account, students are responsible for either reading email there, or, for utilizing the mail forwarding option to forward mail from their account to an email address which they will monitor.

Accommodations: 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.

Incompletes: The grade of Incomplete will be given **only** for emergency situations. In such cases the grade of Incomplete will be assigned only when the course attendance requirement has been met but, for reasons satisfactory to the instructor, the granting of a final grade has been postponed because certain course assignments are outstanding. If the outstanding assignments are completed within one calendar year from the date of the close of term in which the grade of Incomplete was received and a final grade submitted, the final grade will be recorded on the permanent transcript, replacing the grade of Incomplete, with a transcript notation indicating the date that the grade of Incomplete was replaced by a final grade. If the outstanding work is not completed within one calendar year from the date of the close of term in which the grade of Incomplete was received, the grade will remain as a permanent Incomplete on the transcript. In such instances, if the course is a required course or part of an approved program of study, students will be required to re-enroll in the course including repayment of all tuition and fee charges for the new registration and satisfactorily complete all course requirements. If the required course is not offered in subsequent terms, the student should speak with the faculty advisor or Program Coordinator about their options for fulfilling the degree requirement. Doctoral students with six or more credits with grades of Incomplete included on their program of study will not be allowed to sit for the certification exam.

Religious holidays: It is the policy of Teachers College to respect its members' observance of their major religious holidays. Students should notify instructors at the beginning of the semester about their wishes to observe holidays on days when class sessions are scheduled. Where academic scheduling conflicts prove unavoidable, no student will be penalized for absence due to religious reasons, and alternative means will be sought for satisfying the academic requirements involved. If a suitable arrangement cannot be worked out between the student and the instructor, students and instructors should consult the appropriate department chair or director. If an additional appeal is needed, it may be taken to the Provost.

Sexual harassment and violence reporting:

Teachers College is committed to maintaining a safe environment for students. Because of this commitment and because of federal and state regulations, the College must advise you that if you tell any of your instructors about sexual harassment or gender-based misconduct involving a member of the campus community, your instructor is required to report this information to the Title IX Coordinator, Janice Robinson. She will treat this information as private, but will need to follow up with you and possibly look into the matter. The Ombuds officer for Gender-Based Misconduct is a confidential resource available for students, staff and faculty. "Gender-based misconduct" includes sexual assault, stalking, sexual harassment, dating violence, domestic violence, sexual exploitation, and gender-based harassment. For more information, see <http://sexualrespect.columbia.edu/gender-based-misconduct-policy-students>.

Academic Integrity:

The highest level of ethical behavior is expected of all students. It is the responsibility of all students to be familiar with and to follow the Teachers College document entitled, *Guide to Students Rights and Responsibilities*, available online at: <http://www.tc.columbia.edu/oess/index.asp?Id=College+Policies&Info=Guide+to+Student%27s+Rights+%26+Responsibilities&cId=2>.

Plagiarism, cheating, and any form of unauthorized collaboration on examinations, written and oral reports will not be tolerated and will be handled in accordance with Teachers College policies. Submission of others' work, efforts, or ideas as your own is not permitted. Ideas or facts that have come from another person or a written source (including the internet) should be clearly cited within your work. Copying of Internet material, computer files or documents is not allowed at anytime. If you are unsure about what types of information deserve citation, please consult a style guide such as the APA style manual [American Psychological Association (2009). *Publication Manual of the American Psychological Association*].

Association (6th Ed.). Washington, DC: American Psychological Association. It is important to note that students are encouraged to discuss class material, and work together to develop a deeper understanding of the topics presented in this course. However, no collaboration is permitted on the lab reports or take-home lab, or final project which should represent work completed entirely on your own.

Each student is expected to prepare and submit his/her own work, written entirely in his/her own words. The words in your written work should be distinctly different from other students' and published work. It is not enough to change a few words or change the order of the words in a sentence---the sentences should be your own. As a general guideline, no direct quotations should be used. However, if there is a need to include a quotation in your report, do not directly copy more than one sentence from another source, even if it is properly cited. If your sentence is copied directly or closely from another source, including another student's work, put these words in quotations and provide a citation of the source of the words. Suspected violators will be given a zero on the submitted work and may be referred for disciplinary action, where penalties may include but are not restricted to: failure of the course, student placed on probation, submission of judicial findings in the students' permanent record.

Additional Reading References

- Week 2: Gentile A. Skill acquisition: action, movement, and neuromotor processes. In: Carr JA, Shepherd RB, eds. *Movement Science: Foundations for Physical Therapy in Rehabilitation*. Rockville, MD: Aspen Publishers; 2000:111-187.
- Week 5: Shapiro, D. C., Zernicke, R. F., Gregor, R. J., & Diestel, J. D. (1981). Evidence for generalized motor programs using gait pattern analysis. *Journal of Motor Behavior* 13(1), 33 -47.
- Week 7: Fitts, P. M. (1992). The information capacity of the human motor system in controlling the amplitude of movement. *Journal of Experimental Psychology*, 121(3), 262-269. doi: 10.1080/00222895.1981.10735235
- Week 10: Gentile AM. (1972). A working model of skill acquisition with application to teaching. *Quest* 17(1): 3-21.