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Physical Education and Sports Science
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SPORT SCIENCE & MANAGEMENT
SS1024 FOUNDATIONS OF MOTOR BEHAVIOUR AND LEARNING

Academic Year	2024-25	**Semester**	2
Course Coordinator			
Course Code	SS1024		
Course Title	Foundations of Motor Behaviour and Learning		
Pre-requisites	-		
No of AUs	3		
Contact Hours	39		

Course Aims

This course aims to give you an appreciation for the field of motor behaviour and build foundational knowledge across key areas of motor control, motor learning, and motor development, which can be applied to advanced courses. Key theories and concepts will be introduced to help you understand the effects of the complex interaction between organisms, tasks, and environments on human motor behaviour. Important concepts, including degrees of freedom in motor control and practice strategies in motor skill learning, will be gleaned through lectures, tutorials, and practical exercises.

Intended Learning Outcomes (ILO)

By the end of this course, you should be able to:

1. explain the concepts, theories, and problems underpinning human growth, motor control and motor learning.
2. explain the neural mechanisms of motor control.
3. differentiate the learning characteristics as defined in motor learning models.
4. distinguish the different instructional approaches, feedback and practices in motor learning.
5. discuss the factors that influence physical growth and motor development.

Course Content

The following topics will be covered:

1. Overview of motor behaviour as a field.
2. Theories underpinning motor control, motor learning, and motor development.
3. Neuromotor and sensory control of movement.
4. Assessment of motor control and motor learning.
5. Approaches to motor learning (instruction, feedback, practice)
6. Overview of motor development from cradle to grave: growth, maturation, ageing.
7. Fundamental movement skills

NTU Competencies & Graduate Attributes

NTU Competencies	
Character	√
Competence	√
Cognitive agility	

NTU Graduate Attributes	
Graduate Attributes	Level (i.e., basic, intermediate, advanced)
1. Decision Making	Basic
2. Critical Thinking	Basic
3. Project Management	Intermediate
4. Collaboration	Advanced

Assessment (includes both continuous and summative assessment)

Component	**ILO Tested**	**Weighting**	**Team/ Individual**	**Assessment Rubrics**
1. Quiz	1-5	20%	Individual	
2. Video Presentation	1, 3, 4	40%	Team	Appendix 1, 2
3. Final Examination	1-5	40%	Individual	
Total		100%		

Formative Feedback

Feedback for learning will be in verbal form. Group and individual level feedback will be provided on the written test and motor learning sessions. For the written test, general feedback on common mistakes will be provided. For the motor learning assignment, you will receive verbal feedback on the instructional strategies, practice conditions, and types of feedback that are useful for skill acquisition.

Learning and Teaching Approach

Approach	**How does this approach support you in achieving the learning outcomes?**
Lectures	Lectures will provide information on key learning concepts and theories and support understanding how they may be applied in the real world.
Online Learning	Time will be given for learning from online materials as a part of flip teaching approach. These materials will support key concepts covered in lectures, tutorials, and practical sessions.
Laboratories	You will gain exposure to the motor behaviour laboratory and techniques used to measure motor skills and motor learning. Practical classes will also provide study opportunities to create their own

	practice of novel motor skills. The lecturer will provide feedback and information to facilitate your learning of a motor skill and discuss methods of quantifying motor learning.

Reading and References

NIE Research and Publications

1. Chai, K.X.Y., Goodwill, A.M., Leuk, J.S.P., & Teo, W.P. (2023). Treadmill walking maintains dual-task gait performance and reduces frontopolar cortex activation in healthy adults. Neuroscience, 521, 148-156.

2. Teo, W.P., Rantalainen, T., Nuzum, N., Valente, L., & Macpherson, H. (2020). Altered prefrontal cortex responses in older adults with subjective memory complaints and dementia during dual-task gait: An fNIRS study. European Journal of Neuroscience, 53(null), 1324-1333, 3.386.

3. Teo, W.P., Goodwill, A.M., Hendy, A.M., Muthalib, M. & Macpherson, H. (2018). Sensory manipulation results in increased dorsolateral prefrontal cortex activation during static postural balance in sedentary older adults: An fNIRS study. Brain and Behavior, 8(null), e01109.

Other Readings and References

4. Magill, R. A. & Anderson, D. I. (2021). *Motor learning and control: Concepts and applications (12th Ed.)*. New York: McGraw-Hill.
5. Haywood, K.M., & Getchell, N. (2020). *Life Span Motor Development* (7th Ed.). Human Kinetics: Champaign, Illinois.

6. Additional readings will be posted in NTULearn

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned pre-class readings and activities, attend all classes – lecture and laboratory – punctually, submit all scheduled assignments and take tests by due dates. You are not allowed to swap laboratory groups without express permission from the course coordinator. You are expected to take responsibility to follow up with course notes, assignments and course related announcements for sessions they have missed. You are expected to participate in all discussions and class activities unless there is a valid medical reason not to do so.

(2) Absenteeism

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick, supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies.

If you miss a lecture, you must inform the course instructor via email prior to the start of the class.

(3) Absence Due to Medical or Other Reasons

If you are sick and not able to complete a test or submit an assignment, you have to submit the original Medical Certificate (or another relevant document) to the Sport Science & Management (or Home School) administration to obtain official leave. Without this, the missed assessment component will not be counted towards the final grade. There are no make-ups allowed.

(4) Attire and safety

You are expected to participate in practical laboratory activities. Some of these activities involve exercise. You are expected to wear appropriate attire for participation, obey laboratory safety rules, and take appropriate care of and return all equipment after use.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognise your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion, and cheating. If you are uncertain of the definitions of any of these terms, you should go to the NTU Student Academic Integrity Policy and Procedures link in the Student Portal for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Special note: Generative AI tools will be allowed to the extent stipulated for each assignment in the assignment instructions, and any such use must be duly referenced or disclosed.

Course Instructors

Instructor	Office Location	Phone	Email
TBA			

Planned Weekly Schedule

Week	Topic	ILO	Readings/ Activities
1	Course introduction and overview of motor behaviour field	1	Magill & Andersen (2021). Chap 1, 2, 3
2	Theories underpinning motor control	1	Magill & Andersen (2021). Chap 5
3	Neuromotor basis of motor control	1, 2	Magill & Andersen (2021). Chap 4
4	Sensory basis of motor control	1, 2	Magill & Andersen (2021). Chap 6

5	Assessment of motor performance & control	1, 2	Magill & Andersen (2021). Chap 7
6	Definition and stages of motor learning	1, 3	Magill & Andersen (2021). Chap 11,12,13
7	Evidence for efficacy of motor learning	1, 3	Magill & Andersen (2021). Chap 11,12,13
Recess Week			
8	Instruction and feedback for motor learning	1, 4	Magill & Andersen (2021). Chap 14, 15
9	Practice conditions for motor learning	1, 4	Magill & Andersen (2021). Chap 16, 17, 18
10	Fundamental concepts and theoretical perspectives of motor development	1, 5	Haywood & Getchell (2020) Chap 1, 2
11	Growth, maturation, and ageing	1, 5	Haywood & Getchell (2020) Chap 8
12	Fundamental movement skills	1, 5	Haywood & Getchell (2020) Chap 5, 6, 7
13	Revision	1-5	

Appendix 1: Assessment Criteria for Video Presentation (30%)

	A+, A, A-	B+, B	B-, C+, C	D+, D	F
Quality of Content (max 20)	Information provided clearly answers the question set out. Presentation is clear and the flow is coherent and logical.	Information mostly answers the question set. Presentation is mostly clear and the flow generally coherent and logical.	There are weaknesses or absences in the information provided, and the flow of presentation is unclear at times.	Much of the information provided does not answer the question, and the flow is difficult to understand.	Little relevant information and unclear flow.
Use of Theories & Concepts (max 30)	Excellent application of theories and concepts and very clear explanation of processes associated with motor control and motor learning.	Good application of theories and concepts and mostly clear explanation of processes associated with motor control motor learning.	Average application of theories and concepts and, at times unclear explanation of processes associated with motor control and motor learning.	Poor application of theories and concepts, and it is difficult to understand the explanation of processes associated with motor control and motor learning.	No application of theories and concepts to explain the processes of motor control and motor learning.
Quality of Visual & Audio Media (max 20) Clarity refers to clarity of speech narration and clarity of video quality and/or views that are in line with your narration.	Visual and audio media are very clear.	Visual and audio media are mostly clear.	Visual and audio media are unclear at times.	Visual and audio media are unclear most of the time.	No visual or audio media.
Communication and teamwork* (max 20)	Communication is very clear and easy to understand. All members	Communication is clear and easy to understand most of the time. Most	Communication is unclear at times. Varied contributions of different	Communication is unclear and difficult to understand most of the	Communication is unclear and impossible to understand. No team

	of the team make active contributions .	members of the team make good contributions .	team members.	time. Most contributions are provided by a single team member.	member makes an active contribution.
*All individuals within the group are expected to contribute to work involved in the planning, data collection and output. An individual's score may vary from that of the team based on feedback and observations in this area.					

Appendix 2: Peer Evaluation Component for Presentation

For the peer evaluation component, group members within each group will be asked to rate each of their peers, and the score received for each group member will be the average of the scores from their peers' round to the nearest integer (e.g., student gets a score of 9, 8 and 8, respectively from the 3 other group members and will receive a score of 8 (average of 8.3).

Marks	10, 9	8, 7	6, 5	4, 3	2, 1, 0
Peer Evaluation **(10 max)**	Excellent work; was a crucial component of the group's success.	Very strong work; contributed significantly to the group.	Sufficient effort; contributed adequately to the group.	Insufficient effort; met minimal standards of the group.	Little or weak effort; was detrimental to the group.

NB: Numeric scores for peer review do not necessarily align with the letter grade categories.