

Douglas N. Martini, PhD

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Department of Kinesiology
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Websites: PubMed, <https://www.ncbi.nlm.nih.gov/myncbi/douglas.martini.1/bibliography/public/>
Research Gait, https://www.researchgate.net/profile/Douglas_Martini
Google Scholar, <https://scholar.google.com/citations?user=wsXrzH4AAAAJ&hl=en>

Education:

Doctorate of Philosophy: Kinesiology

University of Michigan at Ann Arbor, Ann Arbor, MI 2015
Dissertation: *Long-Term Effects of Concussion on Motor Performance Across the Lifespan*
Committee Chair: Steven P. Broglio, PhD, ATC

Master of Science: Kinesiology

University of Illinois at Urbana-Champaign, Urbana, IL 2010
Thesis: *The Long-Term Effects of Concussion on Gait*

Bachelor of Arts: Biology

Augustana College, Rock Island, IL 2008

Professional Experience:

Faculty

Center for Personalized Health Monitoring 2020 – Present
Institute of Applied Life Sciences, University of Massachusetts Amherst

Research

Director

Movement Neuroscience Laboratory, U of Massachusetts Amherst 2020 – Present

Postdoctoral Research Fellow

Sensorimotor Neuroimaging Laboratory, OHSU 2015 – 2016

Balance Disorders Laboratory, OHSU 2015 – 2020

Graduate Research Assistant

NeuroSport Research Laboratory, University of Michigan 2011 – 2015

Human Sensorimotor Laboratory, University of Michigan 2012 – 2015

Neurotrauma Research Laboratory, University of Illinois 2008 – 2011

Clinical

Rehabilitation Assistant
AthletiCo – Urbana, IL

2008 – 2011

Athletic Training Student
Augustana College Sports Medicine

2004 – 2008

Honors and Awards

Best Poster Award for Postdoctoral Fellow Honorable Mention, ISPGR Conference 2017
American Kinesiology Association Doctoral Scholarship Award, AKA 2015
UM Injury Center – Rackham Graduate Student Research Assistantship 2014
Doctoral Oral Student Award Finalist, NATA Conference 2013
Phi Kappa Phi Honors Society, University of Illinois 2009
Viking Leadership Award, Augustana College 2007

Travel

Military Health System Research Symposium Travel Award (\$2500) 2019
International Parkinson & Movement Disorders Society Travel Grant (\$1000) 2018
School of Kinesiology Travel Grant (\$500) 2015
Rackham Conference Travel Grant (\$700) 2014
School of Kinesiology Travel Grant (\$500) 2014
Rackham Conference Travel Grant (\$700) 2013
School of Kinesiology Travel Grant (\$500) 2013
Rackham Conference Travel Grant (\$700) 2012
School of Kinesiology Travel Grant (\$500) 2012

Grants

Parkinson's Center of Oregon Pilot Grant (\$25,000), PI 2018
Oregon Medical Research Foundation Early Clinical Investigator Award (\$20,000), PI 2017
NIH Loan Repayment Program (\$18,000), Trainee 2017
NIH Loan Repayment Program (\$36,000), Trainee 2015
Rackham Centennial Award (\$6000), PI 2013
Rackham Graduate Student Research Grant (\$3000), PI 2012
Rackham Graduate Student Research Grant (\$1500), PI 2012

Publications

Martini D.N., Morris, R., Madhyastha, T.M., Grabowski, T.J., Oakley, J., Hu, S-C., Zabetian, Edwards, K.L., Hiller, A., Chung, K., Ramsey, K., Lapidus, J.A., Cholerton, B., Montine, T.J., Quinn, J.F., Horak, F. (2020). Relationship between Sensorimotor Inhibition and Mobility in Older Adults with and without Parkinson's Disease. *The Journals of Gerontology: Serie A*.

Parrington, L., Popa, B., **Martini, D.N.**, Chesnutt, J.C., King, L.A. (2020). Instrumented balance assessment in mild traumatic brain injury: Normative values and descriptive data for acute, sub-acute and chronic populations. *Journal of Concussion*.

Vieira-Yano, B., **Martini, D.N.**, Horak, F.B., de Lima-Pardini, A., Almeida, F, Pereira Santana, V, Lima, D, Xavier Batista, A., Marquesini, R., Lira, J, Barbosa, E., Corcos, D.M., Ugrinowitsch, C., Silva-Batista, C. (2020). The Adapted Resistance Training with Instability Randomized Controlled Trial for Gait Automaticity. *Movement Disorders*.

Martini, D.N., Parrington, L., Stuart, S., Fino, P.C., King, L.A. (2020). Gait Performance in People with Symptomatic, Chronic Mild Traumatic Brain Injury. *Journal of Neurotrauma*.

Martini D.N., Morris, R., Kelly, V.E., Oakley, J., Grabowski, T.J., Hiller, A., Chung, K., Hu, S-C., Zabetian, C.P., Poston, K., Mata, I.F., Edwards, K.L., Lapidus, J.A., Montine, T.J., Quinn, J.F., Horak, F. (2020). Sensorimotor inhibition and Mobility in Genetic Subgroups of Parkinson's Disease. *Frontiers in Neurology*.

Mancini, M., Chung, K., Zajack, A., **Martini, D.N.**, Ramsey, K., Horak, F.B., Nutt, J.G. (2019). Effects of augmenting cholinergic neurotransmission on balance in Parkinson's disease. *Parkinsonism & Related Disorders*, 69, 40-7.

Morris, R., **Martini D.N.**, Smulders, K., Kelly, V.E., Zabetian, C.P., Poston, K., Edwards, K., Cholerton, B., Grabowski, T., Montine, Quinn, J.F., Horak, F. (2019). Cognitive associations with comprehensive gait and balance measures in Parkinson's disease. *Parkinsonism & Related Disorders*, 69 104-10.

Stuart, S., Parrington, L., **Martini, D.N.**, Kreter, N., Chestnutt, J.C., Fino, P.C., King, L.A. Analysis of free-living mobility in people with mild traumatic brain injury and healthy controls: Quality over Quantity. *Journal of Neurotrauma*, 37, 139-45.

Stuart, S., Parrington, L., Morris, R., **Martini, D.N.**, Fino, P.C., King, L.A. (2019). Gait Measurement in Chronic Mild Traumatic Brain Injury: A Model Approach. *Gait & Posture*, 69, 102557.

Fling, B.W., **Martini, D.N.**, Zeeboer, E, Hildebrand, A, Cameron, M. (2019). Neuroplasticity of the sensorimotor neural network associated with walking aid training in people with multiple sclerosis. *Multiple Sclerosis & Related Disorder*, 31, 1-4.

Morris, R., **Martini D.N.**, Madhyastha, T., Kelly, V.E., Nutt, J., Horak, F. (2019) Overview of the cholinergic contribution to gait, balance and falls in Parkinson's disease. *Parkinsonism & Related Disorders*, 63, 20-30.

Martini, D.N., Zeeboer, E, Hildebrand, A, Fling, B.W., Cameron, M. (2018). Ambulatory assistive device training prevents falls and may increase physical activity and reduce sitting in multiple sclerosis. *Archives of Physical Medicine & Rehabilitation*, 99(10), 2050-58.

Stuart, S., Vitorio, R., Morris, R., **Martini, D.N.**, Fino, P.C., Mancini, M. (2018). Cortical activity during walking and balance tasks in older adults and in people with Parkinson's disease: A structured review. *Maturitas*, 113, 53-72.

Fino, P., Parrington, L., Pitt, W., **Martini, D.N.**, Chesnutt, J., Chou, L., King, L. (2018). Detecting gait abnormalities after concussion or mild traumatic brain injury: A systematic review of single-task, dual-task, and complex gait. *Gait & Posture*, 62, 157-166.

Martini, D.N. and Broglio, S.P. (2017). Long-term effects of sport concussion on cognitive and motor performance: A review. *International Journal of Psychophysiology*, 132, 25-30.

Lapointe, A., Nolasco, L., Sosnowski, A., Andrews, A., **Martini, D. N.**, Palmieri-Smith, R. M., Gates, D. H., Broglio, S. P. (2017). Kinematic differences during a jump cut maneuver between individuals with and without a concussion history. *International Journal of Psychophysiology*, PIMD: 28818697.

Meehan, S.K., Mirdamadi, J.L., **Martini, D.N.**, Broglio, S.P. (2017). Changes in cortical plasticity in relation to a history of concussion during adolescence. *Frontiers in Human Neuroscience*, 11(5).

Martini, D.N., Eckner, J.T., Meehan, S.K., Broglio, S.P. (2017). Long-term effects of adolescent, sport concussion across the age spectrum. *American Journal of Sports Medicine*, 49(6), 1420-28.

Martini, D.N., Goulet, G.C., Gates, D.H., Broglio, S.P. (2016). Long-term effect of adolescent concussion history on gait, across age. *Gait & Posture*, 49, 264-70.

Broglio, S.P. and **Martini, D.N.** (2016). What are the long-term concerns with concussion? *Athletic Training & Sports Health Care*, 8(5), 191-92.

Whiteside, D., **Martini, D.N.**, Lepley, A., Zernicke, R., & Goulet, G. (2016). Predictors of ulnar collateral ligament reconstruction in Major League Baseball pitchers. *American Journal of Sports Medicine*, 44(9), 2202–2209.

Whiteside, D., **Martini, D.N.**, Zernicke, R., & Goulet, G. (2016). Ball speed and release consistency predict pitching success in Major League Baseball. *Journal of Strength and Conditioning Research*, 30(7), 1787–1795.

Whiteside, D., **Martini, D.N.**, Zernicke, R.F., Goulet, G.C. (2015). Changes in a starting pitcher's performance characteristics across the duration of a Major League Baseball game. *International Journal of Sports Physiology and Performance*, 11(2), 247-54.

Broglio, S.P., Eckner, J.T., **Martini, D.N.**, Kasper, L., Kutcher, J.S. (2013). Estimation of Head Impact Exposure in High School Football: Implications for Regulating Contact Practices. *American Journal of Sports Medicine*, 41(12): 2877-84.

Martini, D.N., Eckner, J.T., Kutcher, J.S., Broglio, S.P. (2013). Sub-Concussive Head Impact Biomechanics: Comparing Differing Offensive Schemes. *Medicine and Science in Sports and Exercise*, 45(4), 755-61.

Broglia, S.P., Eckner, J.T., **Martini, D.N.**, Sosnoff, J.J., Kutcher, J.S., & Randolph, C. (2011). Cumulative Head Impact Burden in High School Football. *Journal of Neurotrauma*, 28(10), 2069-78.

Martini, D.N., Sabin, M.J., DePesa, S.A., Leal, E.W., Negrete, T.N., Sosnoff, J.J., & Broglia, S.P. (2011). The Chronic Effects of Concussion on Gait. *Archives of Physical Medicine and Rehabilitation*, 92(4), 585-89.

Manuscripts Submitted:

Martini D.N., Morris, R., Madhyastha, T.M., Grabowski, T.J., Oakley, J., Hu, S-C., Zabetian, C.P., Edwards, K.L., Hiller, A., Chung, K., Ramsey, K., Lapidus, J.A., Montine, Quinn, J.F., Horak, F. (Under Review). Does attention mediate the relationship between cholinergic activity and mobility in Parkinson's? *Gerontology*.

Martini, D.N., Pettigre, N.C., Wilhelm, J.L., Parrington, L., King, L.A. (Under Review). Wearable sensors for vestibular rehabilitation therapy: a reliability study. *Sensors*.

Martini, D.N., Campbell, K., Parrington, L., Brumbach, B., King, L. A. (Under Review). Instrumenting balance testing for mTBI: the what and which of it all. *J Neurotrauma*.

Morris, R., **Martini D.N.**, Ramsey, K., Kelly, V.E., Smulders, K., Hiller, A., Chung, K., Hu, S-C., Zabetian, C.P., Poston, K., Mata, I., Edwards, K.L., Lapidus, J.A., Cholerton, B., Montine, J.T., Quinn, J.F., Horak, F. (Under Review). Cognition as a mediator of balance and gait in GBA-related Parkinson's disease. *Movement Disorders*.

Wapstra, N. J., Pettet, M. W., **Martini, D. N.**, Lee, A., Zabetian, C. P., Montine, T. J., Koh, N., Horak, F., Oakley, J., Madhyastha, T. M., Grabowski, T. J. (Under Review). Electrophysiological and Cognitive Correlates of Short Latency Afferent Inhibition in Parkinson's Disease. *Frontier in Neuroscience*.

Madhyastha, T., Koh, N., **Martini, D.N.**, Morris, R., Day, T.K.M., Nichols, E., Montine, T.J., Horak, F., Oakley, J., Grabowski, T. (Under Review). Functional correlates of short latency afferent inhibition in Parkinson's disease. *Brain*.

Invited Talks

Gait Domains and Symptom Severity in Chronic mTBI. *4th Annual Traumatic Brain Injury Symposium*, Portland, OR, 2019.

Sensorimotor Integration and Gait in Parkinson's disease. *12th Annual Pacific Northwest Basal Ganglia Coterie*, Salishan, OR, 2019.

Role of Sex on cholinergic activity and attention in Parkinson's disease. *Oregon Health & Science University Neurology Research Day*, Portland, OR, 2018.

Role of Sex on cholinergic activity and attention in Parkinson's disease. *Oregon Health & Science University Research Week*, Portland, OR, 2018.

Gait & Balance in Parkinson's disease; the role of cholinergic activity. *11th Annual Pacific Northwest Basal Ganglia Coterie*, Union, WA, 2018.

Effects of Cholinergic Activity on Gait and Balance in PD. *10th Annual Pacific Northwest Basal Ganglia Coterie*, Whistler, BC, 2017.

Abstracts

Martini DN, Morris R, Madhyastha T, Grabowski T, Hu S-C, Zabetian C, Hiller A, Chung K, Quin, J, Horak F. Role of APOE ϵ 4 status and Sex on Somatosensory Integration and Dual-Task Cost in Parkinson's disease. *International Congress of Parkinson's Disease and Movement Disorders*. Nice, FR, 2019.

Morris, R., **Martini, D.N.**, McBarron, G., Mancini, M., Horak, F. The interplay between cholinergic activity, attention, and turning in Parkinson's disease. *International Congress of Parkinson's Disease and Movement Disorders*. Nice, FR, 2019.

Martini, D.N., Parrington, L., Kreter, N., Chesnutt, J., King, L.A. Assessing the Relationship between Symptom Severity and Gait Performance in a Symptomatic, Chronic mTBI Population Before and After Vestibular Rehabilitation. *2019 Military Health System Research Symposium*, Orlando, FL, 2019. (Platform)

Martini, D.N., Parrington, L., Fino, P.C., Peterka, R.J., Ling, L.A. Central sensorimotor integration delays: does response latency to pseudorandom balance perturbations relate to reaction time? *2019 International Society for Posture and Gait Research World Congress*, Edinburgh, Scotland, 2019.

Martini, D.N., Harker, G., Nutt, J.G., Horak, F. The effects of dopaminergic drug on turning in people with and without Parkinson's disease. *2019 International Society for Posture and Gait Research World Congress*, Edinburgh, Scotland, 2019.

Stuart, S., Parrington, L., **Martini, D.N.**, Fino, P., Chesnutt, J., King, L. Visual exploration during walking and turning in mild traumatic brain injury and controls. *2019 International Society for Posture and Gait Research World Congress*, Edinburgh, Scotland, 2019.

Morris, R., **Martini, D.N.**, Smulders, K., Kelly, V.E., Hiller, A., Chung, K., Hu, S., Zabetian, C.P., Poston, K., Mata, I., Edwards, K.L., Montine, T.J., Quinn, J.F., Horak, F. Comprehensive measures of balance and gait in GBA mutation carriers and non-carriers in Parkinson's disease. *International Society for Posture and Gait Research*. Edinburgh, Scotland, 2019.

Morris, R., **Martini, D.N.**, Smulders, K., Kelly, V.E., Zabetian, C.P., Poston, K., Edwards, K.L., Cholerton, B., Grabowski, T.J., Montine, T.J., Quinn, J.F., Horak, F. Cognitive

Associations with Comprehensive Gait and Balance Measures in Parkinson's disease. *World Parkinson's Congress*, Kyoto, Japan, 2019.

Martini, D.N., Morris, R., Chung, K., Hiller, A., Grabowski, T., Montine, T., Quinn, J., Horak, F. The role of cortical cholinergic activity on mobility and cognition in people with PD with and without cognitive impairment. *Alzheimer's & Parkinson's disease Congress*, Lisbon, Portugal, 2019.

Morris, R., **Martini, D.N.**, Smulders, K., Kelly, V.E., Cholerton, B., Poston, K., Edwards, K.L., Zabetian, C.P., Montine, T.J., Quinn, J.F., Horak, F. Effects of MCI on turning and gait in older adults and Parkinson's disease. *Alzheimer's and Parkinson's disease Congress*, Lisbon, Portugal, 2019.

Martini, D.N., Morris, R., Madhyastha, T., Grabowski, T., Zabetian, C., Kelly, V., Montine, T., Quinn, J., Horak, F. Role of Sex on cholinergic activity on attention and gait in Parkinson's disease. *National Society for Neuroscience*, San Diego, CA, 2018.

Martini, D.N., Morris, R., McBarron, G., Madhyastha, T., Grabowski, T., Quinn, J., Horak, F. Role of Sex on cholinergic activity and attention in Parkinson's disease. *22st International Congress of Parkinson's Disease and Movement Disorders*, Hong Kong, 2018.

Morris, R., Madhyastha, T., **Martini, D.N.**, Smulders, K., Quinn, J., Kelly, V., Edwards, K., Zabetian, C., Grabowski, T., Horak, F. Turning during gait is associated with gray matter density of the nucleus basalis of Meynert in Parkinson's disease. *22st International Congress of Parkinson's Disease and Movement Disorders*, Hong Kong, 2018.

Martini, D.N., Smulders, K., Smith, S., Quinn, J., Horak, F. The interaction of cholinergic activity, gait, balance, and attention in mild cognitive impairment. *2017 International Society for Posture and Gait Research World Congress*, Fort Lauderdale, FL, 2017.

Fling, B.W., **Martini, D.N.**, Hildebrand, A., Zeeboer, E., Cameron, M. Structural and functional connectivity underlying assistive device training-related mobility improvements in people with MS. *2017 International Society for Posture and Gait Research World Congress*, Fort Lauderdale, FL, 2017.

Martini, D.N., Smulders, K., Hiller, A., Chung, K., Quinn, J., Horak, F. Cholinergic activity, mobility, and attention in mild cognitive impairment. *21st International Congress of Parkinson's Disease and Movement Disorders*, Vancouver, BC, 2017.

Martini, D.N., Fling, B.W., Mancini, M., Gendreau A., Horak, F.B., Nutt, J.G. Effects of cholinergic tone on gait and cognition in Parkinson's disease. *National Society for Neuroscience*, San Diego, CA, 2016.

Lapointe, A.P., Nolasco, L., Sosnowski, A., Andrews, E., **Martini, D.N.**, Gates, D.H., & Broglio, S.P. Biomechanical differences during a jump cut motion in those with and without a

concussion history. *5th International Consensus on Concussion in Sport*, Berlin, Germany, 2016.

Martini, D. N., Meehan, S.K., Eckner, J.T., Broglio, S.P. Long-term effects of Adolescent Concussion History on Cognition. *63st Annual Meeting, 7th Exercise is Medicine Congress*, Boston, MA, *Medicine and Science in Sports and Exercise*, 2016.

Lapointe, A.P., Sosnowski, A., Andrewes, E., **Martini, D. N.**, Broglio, S.P. Landing Kinetics Differences in Individuals with and without a History of Concussion. *63st Annual Meeting, 7th Exercise is Medicine Congress*, Boston, MA, *Medicine and Science in Sports and Exercise*, 2016.

Fling B, **Martini D**, Hildebrand A, Zeeboer E, Cameron M. Assistive device training results in improved functional mobility and reduced thalamo-cortical connectivity in people with MS. *Consortium of Multiple Sclerosis Centers Annual Meeting*, Washington, D.C., 2016.

Martini, D.N., Meehan, S.K., Broglio, S.P. Preliminary investigation: Long-term Effects of Concussion on Obstacle Crossing. *62st Annual Meeting, 6th Exercise is Medicine Congress*, San Diego, CA, *Medicine and Science in Sports and Exercise*, 2015. (Platform)

Whiteside, D., **Martini, D.N.**, Zernicke, R., & Goulet, G. Variations in pitching performance during a Major League Baseball game: What can we learn from ball tracking data? *Proceedings of the XXXIII Conference of the International Society for Biomechanics in Sports*, Poitiers, France, 2015.

Whiteside, D., McGinnis, R.S., Deneweth, J.M., Holstad, R., **Martini, D.N.**, Zernicke, R.F., Goulet, G.C. Relating ball flight characteristics, variability in release location and game success in elite baseball pitchers. *XIX Annual Congress of the European College of Sport Science*, Amsterdam, Netherlands, 2014.

Martini, D.N., Mirdamdi, J.L., Meehan, S.K., Broglio, S.P. The Effects of TMS on Neural Plasticity in Young Adults with a Concussion History. *AAN First Annual Sports Concussion Conference*, Chicago, IL, 2014.

Martini, D.N., Meehan, S.K., Broglio, S.P. Preliminary investigation: effects of concussion history on visuomotor performance. *61st Annual Meeting, 5th Exercise is Medicine Congress*, Orlando, FL, *Medicine and Science in Sports and Exercise*, 2014. (Platform)

Martini, D. N., Scott, S.M., Weindorf, J.H, Hudson, S.R., Broglio, S.P., Long-term upper extremity motor performance following concussion: A preliminary investigation, *NATA Annual Meeting & Clinical Symposia*, Las Vegas, NV, 2013 (Platform)

Martini, D. N., Broglio, S. P., The Relationship of Sub-concussive Impacts and Cognition, *59th Annual Meeting, 3rd Exercise is Medicine Congress*, San Francisco, CA, *Medicine and Science in Sports and Exercise*, 44(5): S543, 2012. (Platform)

Broglia, S.P., **Martini, D.N.**, Sosnoff, J.J., Medial-lateral center of pressure velocity is greater in those with a concussion history, *58th Annual Meeting, 2nd Exercise is Medicine Congress*, Denver, CO, *Medicine and Science in Sports and Exercise*, 2011.

Martini, D.N., Sabin, M.J., DePesa, S.A., Leal, E.W., Negrete, T.N., Sosnoff, J.J., Broglia, S.P., The chronic effects of concussion on gait, *International Olympic Committee World Conference on Prevention of Injury and Illness in Sport*, Monte-Carlo, Monaco, *British Journal of Sports Medicine*, 45(4): 361-362, 2011.

Service

Ad-hoc Grant Reviewer
National Athletic Trainer's Association 2016 – Present
Act as an invited external reviewer for proposals

Ad-hoc Journal Editor 2020 – Present
Frontiers in Neurology – Movement Disorders
Frontiers in Rehabilitation Sciences – Interventions for Rehabilitation

Ad-hoc Journal Reviewer 2012 – Present
American Journal of Sports Medicine
Annals of Sports Medicine and Research
Archives of Physical Medicine and Rehabilitation, Elite Reviewer 2017
Athletic Training & Sports Health Care
Clinical Journal of Sports Medicine
Gait & Posture
Journal of Athletic Training
Journal of Applied Biomechanics
Journal of the Neurological Sciences
Journal of Neurotrauma
Journal of Science and Medicine in Sport
Journal of Sport and Health Sciences
Journal of Sports Sciences
Journal of Visualized Experiments
Neural Rehabilitation and Neural Repair
Sensors
Sports
Provide peer-review for 10 articles per year, on average.

Community Outreach
Oregon Museum of Science & Industry Annual Brain Fair 2016 – Present
Volunteer annually educating Portland area youths about static balance with an emphasis on the effects of neurodegeneration and concussion on static balance.

Student Research Mentoring

Annually supervise undergraduate and high school volunteers 2015 – Present
Oversaw two honors students' research projects that develop into presentations to meet honors requirements for the Camas Highschool STEM program. In addition, guiding a Portland State University BUILD EXITO NIH funded undergraduate through statistical analyses and the manuscript writing/submission process.

Professional Organizations

International Society for Posture and Gait 2017 – Present
Movement Disorders Society 2017 – Present
Society for Neuroscience 2016 – Present
American College of Sports Medicine 2010 – 2016

Teaching

Postdoctoral Research Fellow Guest Lecturer

OHSU School of Medicine Guest Lecturer 2018
Lectured on the Cognitive Contributions to Mobility
Pacific University – Physical Therapy Guest Lecturer 2015 – 2016
Lectured on Balance and Postural Control

Graduate Student Instructor

University of Michigan, School of Kinesiology 2011 – 2014
Movement Science 230/231 – Human Musculoskeletal Anatomy 2011 – 2014
Undergraduate course with a focus on full body musculoskeletal anatomy
Athletic Training 310 – Applied Human Anatomy and Physiology 2012
Undergraduate course with expanding musculoskeletal anatomy to the vascular and nervous systems