

# CURRICULUM VITAE

## **Dr. Jared R. Fletcher, PhD**

Mitacs-Accelerate Post-doctoral Scholar

Applied Muscle Physiology Laboratory  
Faculty of Kinesiology, University of Calgary

Research Consultant,  
Biomechanigg Sport and Health Research Inc.

Sport Physiology Consultant,  
National Paralympic Swim Team  
Swimming Canada

Areas of Expertise: running economy; muscle energetics; ultrasound imaging; tendon mechanics; muscle fatigue; heart rate variability; athlete readiness; applied sport physiology.

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Citizenship: Canadian  
Languages Spoken: English, French

**Education:**

Doctor of Philosophy (PhD) in Health and Exercise Physiology at the University of Calgary, Faculty of Kinesiology, Calgary, Alberta, 2014. My supervisor was Brian R. MacIntosh, PhD. The title of my dissertation was “Changes in Achilles tendon compliance and muscle energetics of in vivo human skeletal muscle”.

Master of Science (M.Sc.) in Health and Exercise Physiology at the University of Calgary, Faculty of Kinesiology, Calgary, Alberta, 2008. My supervisor was Brian R. MacIntosh, PhD. The title of my thesis was “the role of the triceps surae muscle-tendon unit on the economy of locomotion in highly-trained distance runners”.

Bachelor of Exercise and Sports Science (B.E.S.S.) at the University of Manitoba, Faculty of Physical Education and Recreation Studies, Winnipeg, Manitoba, 2004. I specialized in both biomechanics and exercise physiology.

**AWARDS and RECOGNITION**

- 2016-2017 Mitacs-Accelerate Postdoctoral Fellowship, in partnership with Own the Podium and BSHR Inc. *Training response of elite athletes using heart rate variability and low-frequency fatigue*”.
- 2015 Research Grant, *Evaluation of Training Readiness using Heart Rate Variability*. Adidas AG Innovation Team and BSHR Inc.
- 2014 Graduate Assistantship (Research)
- 2014 Faculty of Graduate Studies Travel Award
- 2014 Dr. Gord Sleivert Young Investigator Award nominee, Sport Innovation Summit, Montreal, QC
- 2014 Fellow, Teaching Academy, Taylor Institute for Teaching and Learning, University of Calgary
- 2014 Teaching Award for Graduate Assistants (Teaching), University of Calgary
- 2014 Faculty of Graduate Studies Scholarship, University of Calgary
- 2014 Faculty of Kinesiology Presentation Award, University of Calgary
- 2012-2014 Queen Elizabeth II Doctoral Scholarship, University of Calgary
- 2013 Outstanding Doctoral poster presentation nominee, Canadian Society for Exercise Physiology, Toronto, ON
- 2013 Captain Nichola K.S. Goddard Memorial Graduate Scholarship, University of Calgary,
- 2013 Sport Science Excellence Scholarship, Sport Science Association of Alberta
- 2013 Faculty of Kinesiology Presentation Award, University of Calgary
- 2005-2013 Graduate Assistantship (Teaching)
- 2012 Michael Lazar Community Service Award, Faculty of Graduate Studies,
- 2012 Kinesiology Alumni Graduate Award, University of Calgary
- 2012 Most Innovative Student Abstract, Non-invasive Neuromuscular Interest Group, American College of Sports Medicine Annual Meeting, San Francisco CA
- 2010-2012 PGS-D, NSERC Canada
- 2012 Faculty of Graduate Studies (Kinesiology) Special Recognition Scholarship
- 2011 Faculty of Graduate Studies Scholarship
- 2011 Faculty of Graduate Studies Scholarship Special Top-Up Award, University of Calgary,
- 2010 Award for Presentation at an International Conference University of Calgary
- 2010 Queen Elizabeth II Doctoral Scholarship, University of Calgary
- 2009 Outstanding Contribution to the Human Performance Lab, University of Calgary
- 2009 Multi-Scale Muscle Mechanics Conference Travel Award
- 2009 Outstanding Doctoral Student Presentation, EPOWC Conferenc, \$500
- 2009 Graduate Conference Travel Grant
- 2009 Faculty of Graduate Studies Scholarship
- 2007 Faculty of Kinesiology Graduate Scholarship
- 2006 International Studentship Award, German Sport School, Cologne, GER
- 2004-2006 National Aboriginal Achievement Foundation
- 2005 City of Winnipeg Youth Role Model Award
- 2004 University of Manitoba Student Union Scholarship
- 2004 Tom Longboat Award – Manitoba Male Aboriginal Athlete of the Year
- 2004 Canada-West University Athletics Association All-Star
- 2003-2004 RBC Financial Group Academic All-Canadian
- 2003-2004 University of Manitoba Dean’s Honours List
- 2003 Manitoba Aboriginal Youth Achievement Award

### **ARTICLES PUBLISHED IN REFEREED JOURNALS**

- Stoter, I.K., MacIntosh, B.R., **Fletcher, J.R.**, Pootz, S., Zijdwind, I. and F.J. Hettinga. Pacing strategy, muscle fatigue and technique in 1500m speed skating and cycling time-trials. *International Journal of Sports Physiology and Performance*, 2015 Aug 10 [Epub ahead of print].
- Fletcher, J.R.** and B.R. MacIntosh. Achilles tendon strain energy in distance running: consider the muscle energy cost. *Journal of Applied Physiology*, 118:193-199, 2015.
- Fletcher, J.R.**, Pfister, T.R. and B.R. MacIntosh. Energy cost of running and Achilles tendon stiffness in man and woman trained runners. *Physiol Rep*, 1(7), e00178, doi:10.1002/phys2.178, 2013.
- Fletcher, J.R.**, Groves, E.M., Pfister, T.R. and B.R. MacIntosh. Does muscle shortening alone explain the energy cost of muscle contraction in vivo? *European Journal of Applied Physiology*, 113: 2312-2322. 2013.
- Stirling L.M., von Tscharnner V., **Fletcher J.R.**, and B.M. Nigg. Quantification of the manifestations of fatigue during treadmill running. *European Journal of Sports Sciences*, 1-7, 2011.
- MacIntosh, B.R., Esau, S.P., Holash, R.J. and **J.R. Fletcher**. Procedures of rat in situ skeletal muscle contractile properties. *J Vis Exp*. 56:3167. DOI: 10.3791/3167
- Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. Changes in tendon stiffness and running economy in highly-trained distance runners. *Eur J Appl Physiol*. 110: 1037-1046, 2010.
- Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. Economy of running: beyond the measurement of oxygen uptake. *J Appl Physiol*. 107:19,18-22, 2009.

### **LETTERS AND COMMENTARY PUBLISHED IN REFEREED JOURNALS**

- MacIntosh, B.R. and **J.R. Fletcher**. Reply to: Reply to: The parabolic power-velocity relationship does apply to fatigued states. *Eur J Appl Physiol*. Accepted June 3, 2011.
- MacIntosh, B.R. and **J.R. Fletcher**. The parabolic power-velocity relationship does apply to fatigued states. *Eur J Appl Physiol*. 111: 319-320, 2011.
- Fletcher, J.R.** Esau, S.P., Holash, R.J and B.R. MacIntosh. The feasibility of the two-hour marathon is a burning issue. *J Appl Physiol*. 110: 282, 2011

### **ABSTRACTS AND PRESENTATIONS**

- Power, G.A., **Fletcher, J.R.**, Crooks, S., MacIntosh, B.R. and W. Herzog. In situ force-sarcomere length relationship in old rats. *American College of Sports Medicine*, Boston MA. May 2016.
- Power, G.A., Crooks, S., **Fletcher, J.R.**, MacIntosh, B.R. and W. Herzog. Age-related reductions in the length and number of serial sarcomeres contribute to shortened fascicle lengths: a source of elevated passive tension in the elderly? *International Society of Biomechanics*, Glasgow, Scotland. July 2015.
- Power, G.A., **Fletcher, J.R.**, Herzog, W. and B.R. MacIntosh. Comparing apples and oranges: Superimposed twitch vs a control twitch in estimating voluntary activation. *American College of Sports Medicine*, San Diego CA. May 2015.

- Fletcher, J.R.** and B.R. MacIntosh. Theoretical considerations for muscle energy-savings during distance running. Canadian Society for Exercise Physiology, St. John's, NL. Oct 2014.
- Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. Evaluation of low-frequency fatigue in elite Paralympic swimmers: a feasibility study. Sport Innovation Summit, Montreal, QC. Oct 2014.
- Fletcher, J.R.** and B.R. MacIntosh. Changes in Achilles tendon energy return and muscle energy cost following prolonged submaximal running in trained runners. International Calgary Running Symposium, Calgary, AB. Aug 2014.
- Fletcher, J.R.** and B.R. MacIntosh. Theoretical considerations for muscle energy-savings during distance running. Exercise Physiologists of Western Canada Conference, Kelowna, BC. July 2014.
- Fletcher, J.R.** and B.R. MacIntosh. Achilles tendon elastic energy contribution to the energy cost of running. Canadian Society for Exercise Physiology, Toronto, ON. Oct 2013
- Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. A longitudinal examination of blood lactate clearance rates following supramaximal exercise in elite Paralympic swimmers. Sport Innovation Summit. Calgary, AB. Sept 2013.
- Gowans, J., **Fletcher, J.R.** and B.R. MacIntosh. Examination of the force-velocity properties and voluntary activation ratio of the plantarflexors in an elite female Paralympic swimmer. Sport Innovation Summit. Calgary, AB. Sept 2013.
- Fletcher, J.R.** and B.R. MacIntosh. Estimates of Achilles tendon energy storage in distance running. International Workshop on the Biomedical Basis of Human Performance across the Lifespan. Calgary, AB. June 2013.
- Stoter, I.K., MacIntosh, B.R., **Fletcher, J.R.**, Pootz, S., Zijdwind, I. and F.J. Hettinga. The effect of pacing strategy on muscle fatigue and technique in 1500m speed skating and cycling. European College of Sport Science Congress, Bruges, Belgium. May 2012.
- Fletcher, J.R.**, Groves, E.M. and B.R. MacIntosh. *In vivo* human muscle shortening and oxygen consumption. American College of Sports Medicine, San Francisco, CA. *Medicine and Science in Sport and Exercise*, 44(5): S112, 2012
- Esau, S.P., **Fletcher, J.R.** and B.R. MacIntosh. Establishing an active recovery protocol for Paralympic-level swimmers. American College of Sports Medicine, San Francisco, CA. *Medicine and Science in Sport and Exercise*, 44(5): S172, 2012
- Fletcher, J.R.**, Pfister, T., Groves, E.M. and B.R. MacIntosh. The relationship between tendon compliance and the energy cost of running in men and women. Canadian Society for Exercise Physiology, Quebec, QC. *Applied Physiology, Nutrition and Metabolism*, 36:S2, 2011.
- Pfister, T. **Fletcher, J.R.**, Groves, E.M. and B.R. MacIntosh. The effects of Achilles tendon stiffness on muscle energetics and running economy. University of Calgary Students' Union Undergraduate Research Symposium. Calgary, AB. 2010.
- Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. The relationship between  $\text{VO}_2\text{max}$ , body mass and running economy in highly-trained distance runners. Canadian Society for Exercise Physiology, Vancouver, BC, 2009. *Applied Physiology, Nutrition and metabolism*, 34 (S1), 2009.
- Fletcher, J.R.**, MacIntosh, B.R., Austin, N.P. and W. Herzog. Inter-tester reliability of the force-length relationship *in vivo* human vastus lateralis. Proceedings for the Workshop on multi-scale muscle mechanics, Woods Hole, MA., 26, 2009.

**Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. The VO<sub>2</sub>max – running economy relationship in highly-trained distance runners. Exercise Physiologists of Western Canada conference in Winnipeg, MB, August 2009.

**Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. Caloric unit cost as a measure of running economy in trained distance runners. American College of Sports Medicine, Seattle, WA., 2009. *Medicine and Science in Sport and Exercise*, 41(5): S66, 2009.

**Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. Medial gastrocnemius muscle fascicle radius change during maximal plantar flexion and its effect on tendon-aponeurosis elongation. Canadian Society for Exercise Physiology, 2008 in Banff, AB. *Applied Physiology, Nutrition and Metabolism* 33 (S1): S32, 2008.

Esau, S.P., **Fletcher, J.R.** and B.R. MacIntosh. The effects of air quality index levels on the respiratory function of disabled athletes. American College of Sports Medicine conference, Indianapolis, 2008. *Medicine and Science in Sport and Exercise*, 40(5): S362-3, 2008.

**Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh. The effect of isometric training on muscle tendon unit stiffness of medial gastrocnemius and the economy of locomotion in highly trained distance runners. American College of Sports Medicine conference, Indianapolis, IN., 2008. *Medicine and Science in Sport and Exercise*, 40(5): S392, 2008.

Esau, S.P., **Fletcher J.R.** and B.R. MacIntosh. Posttrace lactate levels and classification in international level physically disabled swimmers. Canadian Society for Exercise Physiologists conference in London, ON, Nov, *Applied Physiology, Nutrition and Metabolism* 32: S28, 2007.

**Fletcher, J.R.**, Esau S.P. and B.R. MacIntosh. A novel method to estimate the role of muscle tendon unit stiffness on running economy in highly trained distance runners. Canadian Society for Exercise Physiologists conference in London, ON, Nov, *Applied Physiology, Nutrition and Metabolism* 32: S31, 2007.

**Fletcher, J.R.**, Esau S.P. and B.R. MacIntosh. A novel method to estimate the role of muscle tendon unit stiffness on running economy in highly trained distance runners. Exercise Physiologists of Western Canada conference in Calgary, AB, August, 2007.

Esau, S.P. **Fletcher, J.R.** and B.R. MacIntosh. Posttrace lactate levels and classification in international level physically disabled swimmers. Vista conference of IPC in Bonn, Germany, 2006.

### **ARTICLES IN NON-REFEREED PUBLICATIONS**

**Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh (2015). Evaluation of low-frequency fatigue in elite Paralympic swimmers: a feasibility study. *High Performance SIRCuit*. Winter, 2015, 9.

**Fletcher, J.R.**, Esau, S.P. and B.R. MacIntosh (2008). A novel method to estimate the role of the muscle-tendon unit stiffness on running economy in highly-trained distance runners. *Fitness Informer*. Provincial Fitness Unit of Alberta, Winter 2008, 3.

**Fletcher, J.R.** and S. Aune (2008). What happened to motion control? *Impact Magazine*. March 2008, 55.

### TECHNICAL AND INDUSTRY REPORTS

- Fletcher, J.R.**, Nigg, S. and B.M. Nigg (2015). Monitoring athlete readiness using heart rate variability. Adidas AG, December, 2015.
- Fletcher, J.R.**, Nigg, S. and B.M. Nigg (2015). AFT compression socks: a pilot study. Adidas AG, December, 2015.
- Fletcher, J.R.**, Raso, V., Nigg, S. and B.M. Nigg (2015). Energy cost of walking and lower limb tissue oxygen saturation of *Fit Flop* sandals. Fit Flop Inc. December, 2015.
- Fletcher, J.R.**, Raso, V., Nigg, S. and B.M. Nigg (2015). Does wearing MBT shoes post-exercise speed recovery and improve performance? Masai Barefoot Technology (MBT) Inc. June, 2015.
- Nigg, S., von Tsharner V., Bauman, J., **Fletcher, J.R.** and B.M. Nigg (2015). Heart rate research highlights for studies conducted in 2014. Executive summary Adidas AG. January, 2015.
- Fletcher, J.R.** and S.P. Esau (2013). Benefits of altitude training camps for elite Paralympic swimmers. Technical report for Own the Podium, October 2013

### INVITED LECTURES AND SEMINARS

- Fletcher, J.R.** Physiological and Training Considerations for Paralympic Swimmers: methods of measurement and monitoring. Own the Podium Sport Innovation Summit. Toronto, ON. October 2015.
- Fletcher, J.R.** Assessing athlete readiness using heart rate & heart rate variability. Swimming-Natation Canada Carded Coaches Conference, Montreal, QC. Sept 2015
- Esau, S.P. and **J.R. Fletcher**. Swim too fast and not fast enough: Polarized training in Paralympic swimming. Swimming-Natation Canada Carded Coaches Conference, Calgary, AB. Sept 2014.
- Fletcher, J.R.** The role of the Achilles tendon in distance running: Considerations for the return of elastic energy in reducing the energy cost. Human Performance Lab Seminar Series. April 2014.
- Fletcher, J.R.** and S.P. Esau. Testing and monitoring of elite Paralympic swimmers: how and why? Swimming-Natation Canada Carded Coaches Conference, Toronto, ON. Jan 2014.
- Esau, S.P. and **J.R. Fletcher**. The 'Hothousing Effect': Physiological benefits of planned training camps for Paralympic swimmers. Swimming Natation-Canada Carded Coaches Conference, Toronto, ON. Jan 2014.
- Fletcher, J.R.** Training considerations for Youth swimmers: A physiologist's perspective. Alberta Age Group Championships Coaches Seminar, Calgary, AB. March 2013.
- Fletcher, J.R.** Developing Swimmers' Abilities, Swimming 302, Canadian Swimming Coaches and Teachers' Association, Airdrie, AB. December 2012.
- Fletcher, J.R.** Developing Swimmers' Abilities, Swimming 301, Canadian Swimming Coaches and Teachers' Association, Airdrie, AB. March 2012.
- Fletcher, J.R.** Tendon compliance and skeletal muscle oxygen uptake. International Sports Sciences Symposium, Waseda University, Faculty of Sports Sciences, Tokyo, Japan. February 2012.

**Fletcher, J.R.** Is in-series compliance the distance runner's Achilles heel? The role of tendon stiffness on the economy of locomotion. Human Performance Lab Seminar Series, May, 2011.

**Fletcher, J.R.** Tendon compliance and running economy: A graduate student's research overview. Ambrose University College. Calgary, AB, March, 2011.

**Fletcher, J.R.** and J.P. Sasso. Testing and monitoring of elite athletes: How Canada owned the podium. University of Calgary Chancellor's Tour. February, 2011.

**Fletcher, J.R.** Economy of locomotion and tendon compliance. Applied Exercise Physiology Seminar, Human Performance Lab, Faculty of Kinesiology, University of Calgary. January, 2011.

**Fletcher, J.R.** Chair, Student presentations, Exercise Physiologists of Western Canada Conference, Calgary, AB. August 2007.

**Fletcher, J.R.** Experiences as an Aboriginal student and athlete. 2005 Aboriginal Sport Research Symposium Final Report and Proceedings. Forsyth J. and V. Paraschak. (Ed.), 29-32. Ottawa, ON.

### **MEMBERSHIPS IN PROFESSIONAL SOCIETIES**

American College of Sports Medicine  
Canadian Society for Exercise Physiology  
European College of Sport Sciences

### **REFEREE FOR SCIENTIFIC JOURNALS**

Annals of Human Biology  
Applied Physiology, Nutrition and Metabolism (under B.R. MacIntosh supervision)  
Clinical Physiology and Functional Imaging  
European Journal of Sport Sciences  
Journal of Experimental Biology (under B.R. MacIntosh supervision)  
Journal of Applied Biomechanics  
Journal of Applied Physiology  
Journal of Sports Sciences  
Medicine and Science in Sport and Exercise  
Perceptual & Motor Skills  
Scientific Reports  
Sports Medicine - Open



### **STUDENT/TRAINEE SUPERVISION**

2013-Present	Tessa Gallinger, Strength & Conditioning Specialist, Canadian Sport Institute Calgary <i>Metabolic priming and optimal warm-up for Paralympic swimmers.</i>
2011-2013	Julie Gowans, Strength & Conditioning Specialist, Canadian Sport Institute Calgary <i>Examination of the force-velocity properties and voluntary activation ratio of the plantarflexors in an elite female Paralympic swimmer.</i> (under B.R. MacIntosh supervision)
Winter 2012	Mohammad Maghfourian, Undergraduate honours student <i>The effects of seated yoga on upper extremity isometric strength and muscle activation in female Multiple Sclerosis patients: a pilot study</i> (under B.R. MacIntosh supervision)
Summer 2011	Spencer Pootz, Undergraduate honours student <i>Pacing strategy, muscle fatigue and technique in 1500m speed skating and cycling.</i> (under B.R. MacIntosh supervision)
Summer 2010	Ted Pfister, Undergraduate student, Program for Undergraduate Research Excellence <i>The effects of Achilles tendon stiffness on muscle energetics and running economy</i> (under B.R. MacIntosh supervision)

### **RELEVANT WORK & CONSULTATION EXPERIENCE**

Mar 2010-Present	<p>Sport Physiologist, Para-Swimming division, Swimming Canada. I have been responsible for the regular physiological testing and monitoring of the Canadian Paralympic Swimming team at regular training camps and competitions as well as in the athletes' daily training environments. The monitoring includes daily analysis of heart rate variability, hydration status, haemoglobin and haematocrit changes, including at sea-level and moderate altitude camps as well as frequent consultation and communication with coaches on training theory, periodization and statistical race analyses.</p> <p>Specific training interventions aimed at optimizing training response include:</p> <ul style="list-style-type: none"> <li>• Assessment of training zones and periodized training plans using heart rate and blood lactate analysis.</li> <li>• Estimation of energy cost of swimming and caloric requirements.</li> <li>• Development and implementation of optimal post-race active recovery protocols.</li> <li>• Evaluation of skeletal muscle properties, including force-velocity properties and measurement of low-frequency fatigue.</li> <li>• Biomechanical analysis of the swim start</li> <li>• Statistical analyses of race performance</li> </ul>
Sept 2014-Present	<p>Physiology Consultant, Biomechanigg Sport &amp; Health Research Inc. I have been responsible for physiological monitoring and testing for Industry-sponsored projects supported by BSHR Inc. These include submaximal and maximal metabolic evaluation of different footwear properties in soccer, monitoring of athlete recovery using heart rate and heart rate variability and dynamometry. Industry partners include: Adidas AG, MBT, FitFlop.</p>

- Sept 2015-Present      Exercise Physiology laboratory supervisor. Duties included supervising up to 10 graduate teaching assistants, to lead undergraduate exercise physiology labs. I am responsible for ensuring consistent marking of assignments between TAs, proper functioning of laboratory equipment and appropriate interpretation of laboratory results collected during laboratory time. My duties also include student administration, which includes student accommodations, developing and administering lab quizzes and assignments as well as TA marking keys.
- Feb 2011-Mar 2013      National Coaching Certification Program, Level 3 Learning Facilitator and Sport Specialist, Canadian Swimming Coaches and Teachers Association. I was responsible for preparing and delivering lectures in swimming physiology, training periodization and testing and monitoring of swimmers to coaches (Provincial and National) as well as evaluating comprehension through quizzes, group activity and applicable practice monitoring and evaluation.
- Feb 2007-Mar 2010      Sport physiology technician, Cross Country Canada Para-Nordic Ski team. Responsible for regular testing and monitoring of Canadian Paralympic Nordic skiers at training camps, including hydration status, blood lactate analysis and orthostatic intolerance.

### **TEACHING**

- KNES 373/473      Exercise Physiology. Sept 2006 to Dec 2013. I conducted the fourth year exercise physiology laboratories. Responsibilities included teaching the proper and safe use of physiology laboratory equipment and testing protocols, reinforcing lecture material, marking lab assignments, tests and exams. Topics included isokinetic dynamometry, determination of ventilatory and lactate thresholds, cycle ergometry peak power output, blood lactate testing, determination of maximal oxygen uptake and body composition (skinfolds, hydrostatic weighing, BIA).
- KNES 673      Exercise Physiology (Graduate) Laboratory. Sept 2015 to present. I am responsible for designing, implementing and supervising the 1<sup>st</sup> year graduate course in exercise physiology. Responsibilities also included teaching lab theory, and appropriate use of exercise physiology equipment, appropriate creating and use of physiological data, creating and marking assignments, including manuscript-style lab reports.
- KNES 373      Exercise Physiology. Fall 2011, sessional instructor. Responsibilities include preparing and leading lectures for third and fourth year exercise physiology students, preparing, delivering and administering examinations as well as supervising undergraduate laboratories, including supervising three laboratory assistants for the course.
- KNES 375      Tests and Measurements in Kinesiology. Winter 2011-2012. Responsibilities included teaching the establishment of tests, criteria for selection of tests, measurement devices used to evaluate physiological status, human growth, and skill levels in physical activity programs as well as data analysis techniques, including statistics.

KNES 203/475/485/663

Invited to present select lectures in areas of skeletal muscle energetics, applied exercise physiology, oxygen uptake and caloric expenditure during exercise and imaging of skeletal muscle during exercise (2006-present).

**DEPARTMENTAL AND UNIVERSITY COMMITTEE WORK**

2014-2015	Fellow, Teaching Academy, Taylor Institute for Teaching and Learning, University of Calgary
2010-2013	Student Representative, Graduate Education Committee, Faculty of Kinesiology, University of Calgary
2011-2013	Social Media Director, Graduate Student Executive Council, Canadian Society for Exercise Physiology
2012-2013	Kinesiology Graduate Student Association Secretary-Treasurer, University of Calgary
2011-2012	Graduate Representative, Kinesiology Decanal Search Committee, University of Calgary
2011-2012	Kinesiology Graduate Student Association member-at-large, University of Calgary
2010-2011	President, Kinesiology Graduate Student Association, University of Calgary
2009-2010	Vice-president (Academic, PhD), president-elect, Kinesiology Graduate Student Association, University of Calgary
2007-2010	Student Representative (Kinesiology), Graduate Representative Council, U of C Graduate Student Association
2008-2009	Secretary, Kinesiology Graduate Student Association
2008	Canadian Society for Exercise Physiology Annual Meeting, organizing committee
2007-2008	Research technician, Applied Muscle Physiology Lab, University of Calgary
2007-2008	Member-at-large, University of Calgary Athletics Club
2004	Research assistant, Faculty of Physical Education, University of Manitoba
2004	Student representative, Aboriginal Scholar search committee, Faculty of Physical Education and Recreation Studies, University of Manitoba
2002-2004	President, Manitoba Athletics Athletes' Council
2002-2004	Track and Field/Cross Country team representative, University of Manitoba Athlete Council
1999-2004	University of Manitoba Track and Field and Cross country team member