EXERSCI 309

Practicum in the Exercise Sciences

(15 points)

(Semester 1 or 2, Tāmaki Innovation/Newmarket Campus)

Who should take this course?

The course is designed for those who want to be involved in scientific research in various areas of Exercise Sciences. The location of research can be in one of our Health and Performance clinics, or in one or more research laboratories at the University of Auckland. Research on clinical populations can be conducted in either of these settings. A new option in 2014 relates to Clinical Exercise Physiology where research is conducted into the effects of exercise in people with a wide range of progressive or non-progressive diseases such as kidney disease and stroke respectively.

Learning Outcomes

The experience will help you make a decision as to whether you have interest in postgraduate study, and if so in which area. You shall develop capabilities in technical/science writing, experimental design, and in communicating with clients or participants in clinical or laboratory based studies. The course introduces you to the process of initiating and conducting a research project, such that you develop a capability to discern whether new scientific information is reliable or not.

Learning and Teaching

This is largely active, and experiential. There are no lectures or tutorials, only one-on-one meetings with your academic supervisor. Long before the semester starts, your involvement needs to have been discussed with your supervisor. Details are recorded carefully so that the understandings are clear and defined. You can then prepare for the course and the milestones you shall have to meet with regard to making observations, recording and analysing them, writing a report on your project, and presenting your findings to the Department. Early discussions with your supervisor means that everything can be in place for beginning the project immediately once the semester starts, which helps you progress to your milestones on time and without stress. Please complete the 'intentions sheet' which is available separately.

Teaching Staff

Any academic staff member of the department may have projects which are suitable for hosting you and enrolling in EXERSCI 309. In many cases these possibilities are not highly publicized, so it is best to decide on the kind of area and involvement you want, check with either the departmental administrator or course co-ordinator which staff member(s) to approach, and then do so as early as possible. Sometimes project involvement can be created for you, if you approach the relevant staff member early. The onus is upon the interested student to make the approach, and discuss with the potential supervisor whether a project is possible and viable, and that it is suitable to you (and vice versa).

Some examples of previous years EXERSCI 309 projects are given below.

Assessment (subject to change)

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Pass/Fail</th>
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<tbody>
<tr>
<td>Written Logbook (this substantiates hours)</td>
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<tr>
<td>Preparation and presentation of two reports, 10% each</td>
<td>20%</td>
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<tr>
<td>Final Report &gt;50% of this requirement must be achieved</td>
<td>50%</td>
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<tr>
<td>Oral Presentation</td>
<td>30%</td>
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Student Feedback
Feedback for the last three years has been positive.

Examples of SPORTSCI 309 project topics

- Quantifying Anthropometric Gender Differences within the New Zealand Defence Force.
- Effects of creatine supplementation on time of useful consciousness during extreme hypoxia.
- Biomechanical analysis of ROM before and after FAI surgery.
- Measurement of different forms of sedentary Behaviour.
- The effect of healthy aging and lifelong exercise on left ventricular function during exercise in women.
- Immunohistochemical Staining.
- Comparison of the endurance of CO2 absorbants in a closed-circuit rebreather.
- Moments and angle variation on the hip joint during front squat and back squats.
- Reliability Study of Lower Limb Strength Measured in Adults.
- The characterization of heart rate and metabolic responses to different interval training protocols in healthy adults aged 50 and over.
- Does ankle strength training improve balance after stroke?
- The effect of voluntary exercise on responsivity to occlusion treatment for amblyopia.
- Laboratory evaluations conducted to determine footedness after stroke.
- Practical application of high intensity interval training to cardiac rehabilitation exercise programming.
- The correlation between heart rate and rating of perceived exertion in cardiac patients performing steady state exercise.
- Physical activity, sedentary behaviour and health outcomes in cardiac rehab patients.
- Implement nutritional-based theoretical tools available in common work environments to provide dietary recommendations.
- Biomechanical research study using the 8-camera VICON system and the OpenSim simulation software, to assess variation in gait of normal young adults.
- Investigation of key issues related to VO2 max testing of various clinical populations to determine incorrect prognosis, incorrect re-stratification, incorrect/inaccurate exercise prescription, and the difficulty in evaluating an intervention.
- Study on stroke patients: neurophysiological data collection during TMS (transcranial magnetic stimulation) tests and grip-lift kinetics tests from stroke patients at the chronic stage.
- Using 3D motion analysis to define the contribution of the metatarso-phalangeal joint and the effect of stretching the calf muscles in determining vertical jump performance in young adults.
- Force plate and clinical testing to determine the effect(s) of high dosage Vitamin D administration on the temporal and spatial parameters of gait and on the dynamic balance in elderly people.
- The effects of adrenaline on Oxygen consumption kinetics during intense bouts of cycling.
- Muscle size & function in older New Zealanders - ethnicity, genotypes & vitamin D supplementation.
- Nutritional advice for cardiac rehab clients.
- Investigation of fibre type specific metabolic properties of hypertropic skeletal muscle in myostatin deficient mice.
- Assist with collection of neurophysiological data being conducted in Movement Neuroscience Lab.
- Effects of age on dynamic balance analysing centre of pressure distributions during gait cycle tests.
- Biomechanical Gait Analysis of patients with Hereditary Spastic Paraparesis.
- Biomechanical analysis of long and short grip hitting techniques in the sport of Field Hockey.
- The effect of Vitamin D and Aging on lower limb strength and balance in older New Zealanders.
- Evaluation of the success of the Cardiac Rehab Clinic in reducing risk factors of Stage 2 rehab clients.
- Cardiac Rehab- profiling lipids and improvements in nutrition.
- Sequential Visual Isometric Pinch Task (SVIPT) motor skill learning and retention.
- Biomechanical evaluation of rehabilitation devices.