THE UNIVERSITY OF BRITISH COLUMBIA

Department/Program: School of Kinesiology

Course title: Research Methods -- Year: 2011-2012
                            KIN 570 (3), Section 001

Course schedule: TH 10am – 1pm/(9:30-12:30pm)

Location: Rm, 20 (WMG)

_____

Instructor: Dr Nicola Hodges

Office location: War Gym, top floor (room 300)

Office Phone: 604 822 5895

Office hours: Tu, 3-4pm; Fri, 3-4pm

E-mail address: nicola.hodges@ubc.ca

*THIS COURSE OUTLINE IS MEANT AS A 'REFERENCE TOOL' – FOR NOW AND LATER - DON'T BE ALARMED BY THE AMOUNT OF MATERIAL!

Course objectives:

- Understand the development of research questions and the methods which enable research questions to be answered.
- Understand the relationship between theory and research
- Be aware of the 'scientific method' underpinning research in human kinetics and be able to evaluate this method of acquiring 'truth'.
- Have an understanding of the research methods available for collecting data
- Have an understanding of the research methods available for analyzing data
- Understand the importance of measurement in the answering of research questions
- Be able to critically and constructively analyze others' research
- Know the procedures and criteria for the presentation of research findings
- Understand your ethical role as a researcher in the human sciences
- Practice communication skills (reading, writing, presenting and using social communication tools)

Book (Highly recommended course text)

- Thomas, J.R., Nelson, J.K. & Silverman (2005 or 2011). <u>Research methods in physical activity</u> (5th or 6th edition). Champaign, Il: Human Kinetics.
  LIBRARY: The 2005 version is temporarily shelved at KOERNER LIBRARY reserve collection (Floor 3) # Call Number: GV361 .T47 2005 (# Items:2)

Suggested readings:

- *Berg, K.E., & Latin, R.W (2008). Research <u>methods in health, physical education, exercise science and recreation</u> (3rd ed). Philadelphia, PA: Lippincott, Williams & Wilkins.*
- *Pelham, B.W., & Blanton, H. (2003). <u>Conducting research in psychology: Measuring the weight of smoke</u>. Belmont, CA: Thomson/Wadsworth.*
- *Field, A. (2000 or 2005). <u>Discovering statistics using SPSS</u> (2nd ed). London: Sage Pub Ltd.*

Course assignments, due dates and grading:

assignment	Marks (%)	Date
A. Class participation/ answering questions	15	Ongoing (5 % based on group answers to weekly questions)
B. Stats projects	5	By March 1st (word files with excel tables and SPSS output files inserted or attached as appendices, 1/gp). n =2 or 3/gp.
C. Ethics' tutorial	5	Certificate must be shown to instructor by March 8th
D. Lead readings	20	As allocated
E. Critique of results section	20	By March 1st
F. Research project proposal	35	By March 29th

To make this course maximally beneficial I would encourage you to keep notes on the readings and take notes during the presentations. Make a point of highlighting issues /questions that you need to follow up and check back on these as the course progresses. Please share with the class valuable web sites, free downloads, insights etc (through web VISTA or through the UBC wiki). Try and reflect on the class discussions and issues at the end of each class. Use the internet and additional resources/readings to broaden your knowledge of concepts and issues.

Course assignments:

A. Class participation (10%)

You are required to attend all classes, complete assigned readings (these should be printed out and brought to class) and actively, constructively & respectfully participate in the class.

"Discussion points" (see below) before each class. (5%)

For each Presenter there will be 3 questions which you will have time to discuss and comment upon in groups in class (either all, or maybe 1 or 2 of the questions). You will receive these questions Tuesday evening, so that before the class on Thursday you would have had time to come up with some potential answers. **The class time is for discussion,** not for a first look at the questions. I might also add a question, where appropriate, so that there will be 3-4 discussion questions per presenter. In class, you will be asked to document (i.e., write notes about) the main group points (these will be collected). 5 % of your overall marks will be based on these discussion questions/answers.

In the event that you are unable to make a class you will be required to hand in a summary sheet of the readings as well as individual answers to the group discussion questions by **Monday 4pm following the missed class**.

B. Group statistic's project (5%)

In groups of 2 or 3, you will be required to complete the statistics' project (data will be collected **in class, Jan 26th** and the assignment will be made available just before this time). I have tried to guide you through each question/analysis as much as possible, so that this assignment will be a useful <u>reference</u> for future projects and analyses. The objective of this project is to encourage you to become familiar with a stats' package (SPSS), think about research design, and formulate a basic understanding of statistical issues. It's a good idea to team up so at least one person who has some stats' experience or has used SPSS, although this is not necessary. This class is not a statistics' class, although obviously a basic understanding of statistics is helpful as well as knowledge of a software package which can aid in this process. You are encouraged to take a stats course during your degree. Please discuss this with your supervisor.

The SPSS package is loaded onto the computers in the Education library. In the past it has also been possible to get a short term free version of SPSS http://www.spss.com/spss/. One assignment/group should be submitted to the instructor by **March 1st (1 mark/question)**. The questions are designed to encourage you to complete some basic /important functions and for you to think about the designs. However, feel free to "play" with your data and the SPSS functions. You might find a book by Andy Field (see above) to be particularly useful for running stats with SPSS and of course the 'HELP' menu on SPSS. You can of course complete the assignment individually, then come together as a group to discuss the answers and what to submit

C. Completing the on-line ethics quiz. Certificate needed for approval (5%)

As of September 1st 2005, graduate student researchers are required to complete an ethics' tutorial before submitting a request for an ethical review. UBC Research ethics board (REB) applications will be subject to an additional requirement that all graduate students and medical residents should have completed the Tri-Council Policy statement (TCPS) tutorial prior to submission. The aim of this requirement is to improve understanding of ethics in the research community and, in particular, to ground junior researchers in appreciation of ethical principles and ethical conduct from the start of their careers. Another benefit may be that applications to the BREB (Behavioural) and CREB (clinical) REBs will have fewer basic flaws than in the past. It is a good idea to get started on this straight away. In Sep 2010, the TCPS tutorial was being revamped and students were recommended to complete the online 'Course in Human Research Participant Protection' (CHRPP) offered through Queens' University. If you have completed either the TCPS1 or CHRPP ethics tutorial, then I will gladly accept a certificate of completion as evidence this has been done. If you want a refresher or have not completed the ethics tutorial, then the new tutorial (TCPS2) can be accessed through the Office of Research Services' website: http://research.ubc.ca/ethics/you-apply. You will need to register with an email and password. It can take anywhere from 1 - 3 hours to complete, depending on your interest in the examples and knowledge of research ethics'. It is an interesting, informative and fun tutorial. Please present **the certificate for approval by March 8th** (also please give a copy to your research supervisor).

D. Lead group discussion. (20% total)

In the first class you will be able to choose a topic and its associated readings and then lead a discussion on this topic in a later class (see marking criteria below). **Do not get bogged down with the statistics & formulas if you have a particularly 'complex' reading**, just try and understand the GENERAL concepts and what they might mean for you /us in a Kinesiology research context (especially if it surprises you). Before the class you will be asked to email 3 discussion questions to the instructor.

- BEFORE 4pm on the Tuesday before your lead presentation: **Discussion questions (5%)**

You will be required to identify and send me in a WORD document containing 3 important /relevant questions that relate to the assigned readings and/or the topic in general. These questions should be based on the primary class references (that everyone would have read – in BOLD). However, the main purpose of the questions is to generate discussion on the topic, rather than just testing knowledge of the readings. You are not required to know the 'exact' answer(s) to the question, but you must have thought about possible answers and hence be able to steer/lead the discussion. Sometimes good discussion questions bring in examples, research-relevant knowledge (from your lab experiences or from previous readings)

- Three good questions
- Try to design them so that they STIMULATE DISCUSSION.
- Make your questions CLEAR / DESCRIPTIVE
- There can be multiple parts to the question if helpful (avoid questions which can just be answered Yes/No).
- If you think it would help, perhaps direct the reader to a particular page/reference.

- IN CLASS (~ 1hr – 75 mins): **Lead the discussion and present (10%)**

For the first 10 minutes of each class, people will be working in pairs or small groups (2-3 /group) to discuss and share notes on their answers to the questions. Usually there will be 1-2 questions per group. The focus should be on the **discussion** during this time. The answers should be developed /anticipated before the actual class (questions are posted on WebCT Tuesday eve). Someone in the group will record the answer(s) to the question(s) and these will be collected each class. These can be in note form, but they should be clear and readable. As a lead presenter, you are welcome to listen in to these discussions, provide clarification of terms, but not to contribute conceptually.

The next 20 minutes will be spent talking as a class about these questions. You will lead this discussion with assistance from the instructor where appropriate. If you prefer you can use a few powerpoints to provide some thoughts about your answers to these questions, but this time should be an **interactive session** for all member of the class to participate.

You will then have about 30-40 min to lead a presentation on the topic/readings (plan for & expect ~ 10 min of potential questions/interactions/interruptions during your talk). Focus on the readings which were supplemental to the class reading(s), although don't ignore the main reading(s).

KEY POINTS TO CONSIDER WHEN PRESENTING:

- Use what you have learned from the first class about 'Effective Presentations'.
- Focus on KEY POINTS which span all the readings. Show your ability to synthesize/integrate
- BE SELECTIVE. Do not attempt to cover everything (even though you want to show sufficient evidence that you've done the readings).
- Focus on the USEFUL /CONTROVERSIAL/INTERESTING points
- Show your ability to be critical and thoughtful. Highlight what you think is new and interesting, or complex and perhaps worthy of further reflection/discussion.
- Try and relate the readings (and issues) to your research and desired area of study (or that of the class), your past EXPERIENCE or anticipated future experiences, and other readings/topics in previous classes (where appropriate).
- Incorporate examples, anecdotes or additional references/information -- perhaps from your own experience/ web based research -- into your presentation. You are encouraged to use figures, videos, class demonstrations, pictures or tables (make sure you properly reference any external sources).
- Include the audience in your presentation. This will help to make a more engaging presentation. However, be prepared to steer any discussion appropriately so that you have time to cover your material. Rhetorical questions are good, and inviting people to interrupt at planned times for clarification purposes (especially after something complex) is a good idea.

- AFTER CLASS: **Complete a summary page "Wiki" http://wiki.ubc.ca/course:KIN570 (5%)**

We're trying something new this year – instead of handing in a one-page paper summary of your talk, I would like you to enter your "summary" (approx. 1 WORD page worth) into a Wiki. For a definition of a Wiki see (http://en.wikipedia.org/wiki/Wiki). The UBC wiki is open source for all UBC users with a CWL login. As such, the information that is entered on this wiki is available (and can be edited) by any UBC member.

For each presenter I have made a PAGE for you to SHARE your important points from your presentation; this might include a glossary of important terms, key references, a summary table or figure, weblinks etc. The wiki will be a resource for you throughout the course and time at UBC. The wiki summary should be 'completed' one week after your presentation and will not be marked (by me) until this time. Other students in the class are invited and encouraged to view these pages, provide helpful edits and/or engage in discussion where topics merited such (all entries are clearly visible through the history tab).

All the information for editing your page in the wiki is available on the link. All you need to do is "edit" and "save", there is no need to create any new pages. The "difficult" part is using the wiki tools for uploading and linking or embedding figures or diagrams as well as for formatting. Please look at the "code" in the previous pages (or other wikis) to help with this, or view the tutorials and helps. Be prepared to spend at least half a day on this!

http://wiki.ubc.ca/course:KIN570/TOPICS/

Marking criteria for Lead readings / discussion:

Criteria	Marks	Comments /feedback
1. Depth of reading and understanding (content: demonstration of knowledge)	5	
2. Effort and ability to stimulate discussion. (enthusiasm, presentation style, aesthetics, engagement)	5	
3. Quality of the questions (stimulate discussion, thought provoking, relevant, applied?)	5	
4. Summary Page (3 -4 marks content; 1-2 marks – looks, aesthetics, creativity)	5	

E. Find, understand and Critique a RESULTS section of a paper. (20%)

The aim of this assignment is to help you understand the design/ data analysis/ and Results' section of an empirical paper. **THE ASSIGNMENT WILL BE MADE AVAILABLE IN THE FIRST FEW WEEKS OF CLASS (~13 QUESTIONS).**

Your task is to find an **Experimental or Quasi-experimental paper,** preferably from within your lab. group, something that your supervisor has been involved in, or someone that your supervisor has a connection to (perhaps through grad work or collaborations). This article should have been peer-reviewed and published (or in press). Hopefully this will be a paper that is also of interest to you. Your task is to find one paper that has at least **2 independent variables**. One of these variables should be a between (independent) subjects' variable <u>and preferably</u> one a repeated measures (within/repeated) variable. There should be at least **one figure displaying group-related mean data (not just example data from individual participants)**.

You are strongly encouraged not to repeat a paper reviewed by a fellow student who took this class in the preceding year. If you are repeating a paper reviewed by another student for this class in a previous year, please ensure that the thoughts, wording etc. are all your own.

Please **provide the DOI link (and weblink) to the reference at the top of the Critique**. I will read the Abstract, Methods and Results - although there will be other sections of the paper that might help you with the assignment. Remember that authors do not always explicitly state what the hypotheses are (even though you can still infer what these might or could be). Hidden or potentially missing information pertaining to definitions, inferential or descriptive stats, post-hoc or pre-planned comparisons should still be deduced/induced from the information available in the paper and from your knowledge about research methods.

F. Proposing a research project /experiment. (35%)

We will adopt a conference model whereby each person will be allotted a **40 min time slot for set-up, presentation & questions**. You will be expected to present in **15-20 min (consider these approximate minimums and maximums).** You will have 15-20 minutes for questions & feedback.

The objectives of this piece of coursework are for you to integrate information from the class in order to help you think about thesis-related research question(s) and develop potential solutions

to answer these questions. The proposal does not have to be your thesis proposal (although it is a good opportunity to start making some progress on this), and if it is, it does not need to be the complete proposal (e.g., experiments 1-3). <u>It should be more than a pilot study, in that the proposal should be developed in such a way that if completed it could be suitable for publication.</u>

You will not be assessed on the quality of the research question/proposal as this is something that you will discuss with your supervisor and committee. Some of your class mates (and maybe the instructor), might have some comments and feedback about the quality of your proposal, <u>but questions, feedback and assessment will primarily be based upon the quality of your research methods (ie how you go about 'solving' the question/problem)</u>. Therefore, make sure you answer the research methods' questions detailed below and keep the detail brief pertaining to the background for your research question and the procedures *unless there are reliability and validity issues.* For example, will the design you've chosen be able to answer your research question (so we need to be clear what the question is), will you be able to determine the scientific validity of your data, are your proposed statistics appropriate, is your choice of measurement sensitive to the potential variables you will manipulate, are you aware of potential limitations in the design/methods etc? When these are presented in class the discussion period following will be designed to help you address outstanding issues.

When you are part of the audience focus your questions (or feedback) on the design/research methods and analysis. Asking questions at this stage will HELP your peers write a potentially better proposal, so please try to engage in all of the talks and the question period.

Presentation: 10 %

5 marks will be awarded for the quality of the presentation (clarity, organization, timing). You should aim for ~17 min, in order that you cover sufficient information, but that you are concise and selective. 20 minutes is the absolute maximum, if you go beyond 20 minutes I will cut you off… SO PLEASE PRACTICE BEFOREHAND. **5** marks will also be awarded at this time for content (whether you have adequately addressed the 4 criteria below as well as presented tables and figures). It's a very good idea to get a friend to write notes for you during the question period so you have a record of the questions and can incorporate the feedback.

Written document: 25 %

A total of 25 marks will then be awarded ba**s**ed on the written document. These marks will be awarded for content (approx 5 marks/ section as detailed below, with 5 additional marks for the informativeness/ quality of the tables and figures). Please section your work according to the main headings and questions as detailed below: (1) Brief introduction /background, research question & hypotheses, (2) Methods (including participant information, experimental design, procedures as they relate to issues of validity and reliability…do not go into unnecessary detail here), (3) proposed analyses & anticipated results and (4) potential issues and limits. Figures and tables should go in appendices (there is no limit, but please only include appendices that add to your story and avoid redundancies such as making Figures for all the DVs if you think that they will respond in similar ways to the conditions). Please make sure you properly reference Tables and Figures in the text and explain what is in them if it is not immediately clear. The tables and figures should also, however, stand alone, so make sure you have informative captions, clear labeling etc.

Present and write up a research proposal (2 written pages maximum, 12 point font, Times New Roman – figures, tables, diagrams should be appended as additional pages and there is no limit, but avoid redundancy in presentation). The proposal should contain the following:

1.   Research question(s)-- general purpose/aims and specific hypotheses.

- You will need to provide some justification for the choice of question via a *brief* introduction (2 or 3 sentences). Why are you proposing to do this experiment /study?
- **Talk about predictions in terms** of **main effects and interactions** and state your experimental hypotheses (and direction) in terms of your **major dependent variables**. You can explicitly talk about main effects and interactions in this section, <u>or</u> in the Results' section (whatever makes most sense to you…there's no need to repeat this information). If you do not talk about main effects or interactions explicitly in this section, make sure your hypotheses relate to ALL your primary factors (Independent variables) and are stated in terms of your dependent variables. For example, it is expected that both groups will improve after exercise in terms of reaction times (RTs) (main effect), but more specifically that Group A will have faster RTs than group B, in the post-exercise test only (interaction – ie., the effect of group will <u>depend</u> on when it's assessed, such that only in the posttest will the groups be different because this is after the intervention).

2.   Methods

- Participants (who, how will they be chosen, allocated to groups, delimitations etc). Think about operational definitions and implications for validity (internal & external).
- Task /design. How many factors/variables? Think about implications for reliability /validity. What are between and what are your within/repeated measures/variables (see also analysis below).
- Procedure. What variables will you control?
- If it helps, use a figure to show your experimental set-up/equipment, where participants will stand /sit etc.
- <u>**Include at least one Table**</u> **showing the procedure and research design**. Think about the between and repeated/within variables (generally repeated measures would appear as different columns, showing a chronological progression in time of the methods, and different groups as different rows). You could also give some procedural information…what changes at different time points and across the various groups/conditions? Number or type of trials/exercises or blocks of trials etc.

3.   Analysis and Results

- Design /analysis (statistics). Consider how you will analyze your data (i.e., what stats you will use?). Are you using between or within subject factors? How will you compare means when there are more than 2? What are your dependent variables, are they sensitive to the effects of your independent variables?

Anticipated results:
- Think about your predictions here in terms of **main effects and interactions**. Make sure you include some statements here relating to these issues.
- <u>Figure</u> (s) showing anticipated results for at least one dependent variable. If you have more than one variable this should be an interaction graph. Make sure you label appropriately and think about your scale (at least approximately).

4. Anticipated problems/ issues

- Discuss any methods' based problems you forsee and how you propose to deal with these (these can also be discussed in the appropriate sections above). Will there be participant issues, equipment issues, statistical issues, potential confounds etc? How will/could these potentially affect your data? For example, "I anticipate that there will be a problem with fatigue, due to the repeated measures. I will need to monitor this potential issue during testing, perhaps run additional stats. to test for order effects as later conditions might be slower, and perhaps in further experiments change the procedures such that testing time is reduced."