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Psychology 430	Psychophysiology in Health Research	Fall 2015
<b>Instructor:</b>	Mr. Josh Rash	<b>Lecture Location:</b> AD 051/053
<b>Phone:</b>	403-210-8606	<b>Lecture Days/Time:</b> TR 12:30 – 13:45 PM
<b>Email:</b>	<a href="mailto:jarash@ucalgary.ca">jarash@ucalgary.ca</a>	<b>Lab Location:</b> AD 051/053
<b>Office:</b>	A-225	<b>Lab 1 Day/Time</b> Fri 9:00am-10:50am
<b>Office Hours:</b>	By appointment only	<b>Lab 2 Day/Time</b> Fri 11:00am-12:50pm
		<b>Teaching Assistant</b> Jill Johnson
		<b>Email</b> <a href="mailto:J.a.johnson@ucalgary.ca">J.a.johnson@ucalgary.ca</a>

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### Course Description

This course will provide an overview of the basic theoretical, methodological, and applied issues in the field of psychophysiology. Psychophysiology takes an integrative perspective on the mind-body relationship that involves the synthesis of physiological changes that occur during cognitive, affective, and behavioral states. Psychophysiological methodology has been traditionally characterized by non-invasive electrophysiological measures of central and autonomic nervous system activity (e.g., heart rate, electroencephalography, and skin conductance), taken in conjunction with psychological and behavioral indices. Contemporary psychophysiologicalists may also employ brain imaging techniques such as fMRI as well as endocrine measures such as cortisol. Psychophysiology is therefore a theoretical exploration of the mind-body relationship with a characteristic methodology to assess that relationship. This course addresses fundamental issues that historically have driven the field, and also covers applications of psychophysiology to cognitive, clinical, developmental, social, and personality psychology.

This is not a course on nervous system anatomy and physiology, but we will spend a little time reviewing these topics. It is assumed that you have a basic familiarity with these areas through previous coursework, and you can review them further as you see fit (a solid foundation in these areas is essential to becoming a good psychophysiologicalist). This is also not a hands-on, technical course in psychophysiological recording; an in-depth consideration of that area exceeds the scope of the course. Again, such technical knowledge is critical, and it will be addressed to some degree, but expertise in this area is generally better acquired after one has a basic knowledge of the fundamentals.

**Course Objectives:** After completing this course, students should know

1. The conceptual basis of several psychophysiological measures
2. How to perform a select set of psychophysiological measurements, including set-up, administration, data acquisition, and data processing.
3. The principles of study design in psychophysiology

#### 4. How to critically evaluate the advantages and disadvantages of psychophysiological techniques

#### **Course Structure:**

The course will involve a combination of lecture, discussion, and demonstrations. This will be a very interesting course consisting of a healthy mixture of lecture, discussion, and hands on learning.

#### **Prerequisites**

Psychology 312: Experimental Design and Quantitative Methods for Psychology; and  
Psychology 330/437: Health Psychology

#### **Text**

Andreassi, J. L. (2007). *Psychophysiology: Human behavior and physiological response*(5<sup>th</sup> ed.). Mahwah :  
Lawrence Erlbaum Associates. **(Recommended but not required)**

Stern, R.M., Ray, W.J., & Quigley, K.S. (2001). *Psychophysiological recording*(2<sup>nd</sup>ed.) Oxford: University  
Press Inc. **(Available online through the U of C library)**

Journal articles: The text will be supplemented by readings that will be announced in class.

#### **Additional Materials Available in the Library:**

Cacioppo, J.T., & Tassinari, L. G. (Eds.) (1990). *Principles of psychophysiology: Physical, social, and  
inferential elements*. Cambridge: Cambridge University Press.

Cacioppo, J. T., Tassinari, L. G., & Berntson, G. G. (Eds.) (2007). *Handbook of psychophysiology* (3<sup>rd</sup>  
ed).Cambridge: Cambridge University Press.

#### **Evaluation**

- 1. 2 Lab reports [20% of final grade (10% per lab report)]:** Students in the class will conduct psychophysiology experiments during scheduled laboratory times. You will write a brief research report detailing the results from two laboratory experiments (i.e., Electrodermal activity lab conducted on September 25<sup>th</sup> and Cardiovascular Activity lab conducted October 9<sup>th</sup>). Your lab reports should adhere to the following guidelines:

- Formatted for *Psychophysiology* (APA style)
- Sections
  - *Title Page*
  - *Abstract* – 250 words or less
  - *Introduction*: Explain the rationale for the experiment in 500 words or less
  - *Materials and Methods*: No word limit. Be thorough but concise.
    - Clearly explain who was tested, what equipment was used, and the experimental procedure.
  - *Data Processing*: No word limit.
    - Explain how the data was processed and the variables of interest were quantified
  - *Results*: No word limit

- You will be provided with statistical results (performed using SPSS and posted on blackboard) on the Tuesday following the electrodermal activity lab and the mental stress lab. You are to prepare a results section using the statistics provided.
  - Refer to academic manuscripts if you need help (e.g., *Biological Psychology, Psychophysiology*)
  - *Discussion*: No more than 500 words
    - Were your hypotheses tested?
    - How does this data fit in with previous research?
    - What new information does this data add to the literature?
    - What are future directions?
    - What limitations were there?
  - **Due Dates**: Your lab report for the Electrodermal Activity experiment is due on **October 13, 2015** and your lab report for the Mental Stress experiment is due on **October 27, 2015**. Electronic copies of your lab reports are due at the start of class and should be submitted via e-mail.
  - **Late submissions**: Will be assessed a penalty of 10% per day for each day following the submission deadline (including weekends).
- 2. Individual Research Proposal (25% of final grade)**: As scientists, we are detectives. We are each here to identify and solve a mystery. Your first assignment is to develop a research proposal to answer a scientific question that you can test using at least one psychophysiological measure that covered in this course. As you think about what you should do, remember this: BABY STEPS. It would be really exciting to come up with something grand and dramatic, however that is probably unrealistic. Think along the lines of a subtle twist, something simple and small, but clear and elegant. Your research proposal must adhere to the following guidelines
- Length 4-7 pages (not including title page, abstract, and references)
  - Formatted for *Psychophysiology* (APA style)
  - Sections
    - *Title page*
    - *Abstract* - 250 words or less
    - *Introduction*: Tell the story of your project in 500 words or less
      - Start by getting the reader's attention: Why should your project be chosen?
      - Present the evidence: What is the mystery? What evidence do you have? What is the missing link?
      - State your **hypothesis**: Very briefly, how do you propose to solve your mystery? Based on the evidence, what do you think the results will be?
    - *Materials and Methods*: No word limit. Be thorough but concise. THE ISSUE HERE IS NOT QUANTITY, BUT QUALITY!! YOUR EXPLANATIONS MUST BE CLEAR!
      - Exactly how will you conduct your research?
        - What participants will be tested?

- Clearly state your variables. What apparatus will you need?
  - What procedures will you use?
  - How will your data be processed and analyzed?
  - *Anticipated results*: In one paragraph, state your anticipated results and their relevance
  - Due Date: **October 29, 2015**. An electronic copy of the research proposals is to be submitted by the beginning of class via e-mail.
  - **Late submissions**: Will be assessed a penalty of 10% per day for each day following the submission deadline (including weekends).
- 3. Presentation (15% of final grade)**: You are to select a psychophysiology research article of your choice and prepare a 10-minute presentation summarizing this article. You will then present this to the class. Your presentation should include:
- An informative summary of the psychophysiological article that describes:
    - The issue under investigation
    - What psychophysiological measures were used
    - How the experiment was conducted
    - What the findings were
  - **Importantly**: Your presentation should also mention
    - Why the authors used the particular psychophysiological measures that they chose
    - The advantages and disadvantages of this technique
    - Other techniques that could be used (if other psychophysiological techniques could be used to answer this question).
  - You are to provide me with a copy of the article that you have selected along with your powerpoint slides (via e-mail or printed copy) on the day of your presentation.
  - Consider looking in the following journals to locate research articles (*Biological Psychology*, *Psychophysiology*, *International Journal of Psychophysiology*)
  - **Missed Presentations** will be assigned a grade of 0%.
- 4. Manuscript write-up from class research project (40% of final grade)**: Students in the class will conduct a basic research project during the month of November. Each student is to recruit 2 participants (friends, family members, fellow students not enrolled in this class) for a research project that we have designed for you. This research project will be conducted outside of class time. A key can be signed out from the main office allowing access to a room with psychophysiological recording equipment where participants can be tested. **THIS EQUIPMENT IS EXPENSIVE AND IT IS YOUR RESPONSIBILITY TO CARE FOR THE EQUIPMENT WHILE YOU ARE TESTING YOUR PARTICIPANTS.** During this research project you will:
- Inform your participant about the nature of their participation and have them completed an informed consent form (we will provide this form).
  - Turn on the psychophysiology recording equipment.
  - Attach ECG leads and skin conductance electrodes
  - Ensure that the signal is recording

- Begin the experiment and flag events (baseline, response task 1, return to baseline, response task 2, recovery)
- Save the file as (your last name-participant01)

Once members of the class have run their research participants I will clean and analyze the data to obtain informative information. I will then spend one class period performing basic statistical analyses on the data. These analyses will be given to students to write up into a manuscript. The manuscript should include the following sections:

- *Abstract*: No more than 250 words
- *Introduction*: No more than 500 words
- *Materials and Methods*: No word limit. Be thorough and concise
- *Results*: No word limit. Be thorough and concise. Include
  - Descriptive statistics
  - Correlations
  - Mixed model analyses of variances
  - Refer to academic manuscripts if you need help (e.g., *Biological Psychology*, *Psychophysiology*)
- *Discussion*: No more than 1000 Words.
  - Were your hypotheses tested?
  - How does this data fit in with previous research?
  - What new information does this data add to the literature?
  - What are future directions?
  - What limitations were there?
- **Due Date: December 15, 2015.** An electronic copy of your term manuscript is to be submitted by 4:00pm via e-mail.
- **Late submissions:** Will be assessed a penalty of 10% per day for each day following the submission deadline (including weekends).

### **Department of Psychology Grade Distribution Policy**

The distribution of grades in Psychology courses (the percentage of A grades, B grades, etc.) will be similar to the distribution of grades in other courses in the Faculty of Arts. The Department monitors the grade distributions of 200-, 300-, and 400-level courses in the Faculty to ensure that the grade distributions in Psychology courses are comparable. Based on these reviews, students can expect that 1) up to 30% of grades in 200- and 300-level psychology courses will be “A” grades (A+, A, and A-), and 2) up to 40% of grades 400-level psychology courses will be “A” grades.

### **Department of Psychology Criteria for Letter Grades**

Psychology professors use the following criteria when assigning letter grades:

**A+ grade: *Exceptional Performance.*** An A+ grade indicates near perfect performance on multiple choice and short answer exams. For research papers/essays/course projects/presentations, an A+ grade is awarded for exceptional work deserving of special recognition and is therefore not a common grade.

A, A- Range: *Excellent Performance*. Superior understanding of course material. Written work is very strong in terms of critical and original thinking, content, organization, and the expression of ideas, and demonstrates student's thorough knowledge of subject matter.

B Range: *Good Performance*. Above average understanding of course material. Written work shows evidence of critical thinking and attention to organization and editing but could be improved in form and/or content.

C Range: *Satisfactory Performance*. Adequate understanding of course material. Knowledge of basic concepts and terminology is demonstrated. Written work is satisfactory and meets essential requirements but could be improved significantly in form and content. Note: All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of C-.

D range: *Marginally meets standards*. Minimal understanding of subject matter. Written work is marginally acceptable and meets basic requirements but requires substantial improvements in form and content. Student has not mastered course material at a level sufficient for advancement into more senior courses in the same or related subjects.

F grade: *Course standards not met*. Inadequate understanding of subject matter. Written work does not meet basic requirements. Student has not demonstrated knowledge of course material at a level sufficient for course credit.

### Grading Scale

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

As stated in the University Calendar, it is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades.

In this course there will be no rounding up of final grades, especially in light of the opportunities students have to increase their final grade via research participation.

### Tentative Lecture Schedule for Fall 2015 (subject to modifications)

Date	Topic	Readings	Due Dates and Course Info	Important Dates
T Sep 8	Course information & Syllabus	None		Lectures begin.
R Sep 10	Basic principles of Psychophysiology	1) "Ch's 1& 5" in Stern, Ray & Quigley, (2001). <i>Psychophysiological recording</i> . 2) Optional "Ch's 1 & 2" in Andreassi, J. L. (2007). Psychophysiology book		
T Sep 15	The nervous	1) "Ch's 2& 3" in Stern, Ray &		

	system and measurement of its activity	Quigley, (2001). <i>Psychophysiological recording</i> . 2) Optional "Ch's 3" in Andreassi, J. L. (2007). <i>Psychophysiology book</i>		
R Sep 17	Equipment for psychophysiology recording	1) For Reference "Biopac Systems, <i>Biopac student lab PRO manual</i> " available from <a href="http://www.biopac.com/Manuals/bsl%20pro%203_7%20manual.pdf">http://www.biopac.com/Manuals/bsl%20pro%203_7%20manual.pdf</a>		
T Sep 22	Electrodermal activity	1) "Ch 13: Electrodermal activity" in Stern, Ray & Quigley, (2001). <i>Psychophysiological recording</i> . 2) Optional "Ch 9" in Andreassi, J. L. (2007). <i>Psychophysiology book</i>	Lecture on Skin conductance	
R Sep 24	Electrodermal activity	1) Meijer, E. H., Selle, N. K., Elber, L., & Ben-Shakhar, G. (2014). Memory detection with the Concealed Information Test: A meta analysis of skin conductance, respiration, heart rate, and P300 data. <i>Psychophysiology, 51</i> (9), 879-904.	Experiment on lie detection	
T Sep 29	Electrodermal Activity – Lab Assignment	Boucsein, w., Fowles, D. C., Grimnes, S., Ben Shakhar, G., Roth, W. T., Dawson, M. E., & Fillion, D. L. (2012). Publication recommendations for electrodermal measurements. <i>Psychophysiology, 49</i> , 1017-1034.	Review output for Electrodermal Activity Assignment	
R Oct 1	Measurement of Blood Pressure	1) O'Brien, E., Asmar, R., Beilin, L., Imai, Y., Mallion, J. M., Mancia, G., ... (2003). European Society of Hypertension recommendations for conventional, ambulatory and home blood pressure measurement. <i>Journal of hypertension, 21</i> (5), 821-848. 2) Optional "Ch 14" in Andreassi, J. L. (2007). <i>Psychophysiology book</i>	British Hypertension Society guidelines	
T Oct 6	Cardiovascular Activity	1) "Ch 12: Cardiovascular system" in Stern, Ray & Quigley, (2001). <i>Psychophysiological recording</i> . 2) Appelhans, B. M., & Luecken,	ECG basics, cardiovascular reactivity and recovery	

		L. J. (2006). Heart rate variability as an index of regulated emotional responding. <i>Review of general psychology, 10</i> (3), 229. 3) Optional "Ch's 12&13" in Andreassi, J. L. (2007). Psychophysiology book		
R Oct 8	Cardiovascular Activity		1) Experimental stress task 2) Heart Rate Variability Measurement <b>Must have idea for research proposal approved</b>	
T Oct 13	Cardiovascular Activity – Lab Assignment		Review output for Cardiovascular Activity Lab <b>Electrodermal Activity Lab Report Due</b>	
R Oct 15	Salivary Biomarkers	To be assigned	Guest lecture Dr. Gerald Giesbrecht	
T Oct 20	Electromyography	1) "Ch 8: Electromyography" in Stern, Ray & Quigley, (2001). <i>Psychophysiological recording</i> . 2) Fridlund, & Cacioppo, (1986). Guidelines for human electromyographic research. <i>Psychophysiology, 23</i> (5), 567-589. 3) Optional "Ch 8" in Andreassi, J. L. (2007). Psychophysiology book	Basics of electromyography	
R Oct 22	Electromyography		Specificity of emotion experiment	
T Oct 27	Research Project Demonstration		<b>Cardiovascular Activity Lab Report Due</b>	
R Oct 29	To be Determined		<b>Research Proposal Due</b>	
T Nov 3	EEG	1) "Ch 7: Electroencephalography" in Stern, Ray & Quigley, (2001). <i>Psychophysiological recording</i> . 3) Optional "Ch's 3&4" in Andreassi, J. L. (2007).	EEG guest lecture Mr. Filomeno Cortese	



		Psychophysiology book		
R Nov 5	fMRI	To be assigned	Guest Lecture Mr. Ted Sloan	
T Nov 10	Biofeedback	To be assigned		
Nov 11-15	Reading Days. No lectures.			
R Nov 12	Reading Days. No lectures.			
T Nov 17	Sleep	To be assigned	Methods and measurement in sleep research	
R Nov 19	Student Presentations		Student Presentations	
T Nov 24	Student Presentations		Student Presentations	
R Nov 26	Student Presentations		Student Presentations	
T Dec 1	Research Project Results		Review output and discuss results of research project	
R Dec 3	Research Project Results		Review output and discuss results of research project	
T Dec 8	No Class			Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.
Dec 15	Fall Term Exam Period.		<b>Research project manuscript is due</b>	

### Important Dates

- **Friday September 18** - Last day to drop full courses (Multi-term) and Fall Term half courses. No refunds for full courses (Multi-term) or Fall Term half courses after this date
- **Monday September 21** - Last day to add or swap full courses (Multi-term) and Fall Term half courses. Last day for change of registration from audit to credit or credit to audit.
- **Friday September 25** - Fee payment deadline for Fall Term full and half courses.
- **Monday October 12** - Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.
- **Wednesday November 11** - Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.

### Reappraisal of Grades

A student who feels that a piece of graded term work (e.g., term paper, essay, test) has been unfairly graded, may have the work re-graded as follows. The student shall discuss the work with the instructor within 15 days of being notified about the mark or of the item's return to the class; no reappraisal of term work is permitted after the 15 days. If not satisfied, the student shall immediately take the matter to the Head of the department offering the course, who will arrange for a reassessment of the work

within the next 15 days. The reappraisal of term work may cause the grade to be raised, lowered, or to remain the same. If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the Dean of the faculty offering the course within 15 days of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal, and the remedies being sought, along with any special circumstances that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

### **Plagiarism and Other Academic Misconduct**

Intellectual honesty is the cornerstone of the development and acquisition of knowledge and requires that the contribution of others be acknowledged. Consequently, plagiarism or cheating on any assignment is regarded as an extremely serious academic offense. Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Students should examine sections of the University Calendar that present a Statement of Intellectual honesty and definitions and penalties associated with Plagiarism/Cheating/Other Academic Misconduct.

### **Academic Accommodation**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services ; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://www.ucalgary.ca/access/).

Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor.

The full policy on Student Accommodations is available at [http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy\\_0.pdf](http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy_0.pdf) .

Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than 14 days after the start of this course.

### **Absence From A Test/Exam**

Makeup tests/exams are **NOT** an option without an official University medical excuse (see the University Calendar). A completed Physician/Counselor Statement will be required to confirm absence from a test/exam for health reasons; the student will be required to pay any cost associated with this Statement. Students who miss a test/exam have up to 48 hours to contact the instructor and to schedule a makeup test/exam. Students who do not schedule a makeup test/exam with the instructor within this 48-hour period forfeit the right to a makeup test/exam. At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Except in extenuating circumstances (documented by an official University medical excuse), a makeup test/exam must be written within 2 weeks of the missed test/exam during exam make-up hours provided by the department <http://psychology.ucalgary.ca/undergraduate/exam-and-course-information#mues>. If a student cannot make write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam

[http://www.ucalgary.ca/registrar/exams/deferred\\_final](http://www.ucalgary.ca/registrar/exams/deferred_final). Under no circumstances will this be accommodated by the department.

### **Travel During Exams**

Consistent with University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods. Requests to write a make-up exam because of conflicting travel plans (e.g., flight bookings) will NOT be considered by the department. Students are advised to wait until the final examination schedule is posted before making any travel arrangements. If a student cannot make write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam

[http://www.ucalgary.ca/registrar/exams/deferred\\_final](http://www.ucalgary.ca/registrar/exams/deferred_final). Under no circumstances will this be accommodated by the department.

### **Freedom of Information and Protection of Privacy (FOIP) Act**

The FOIP legislation disallows the practice of having student's retrieve tests and assignments from a public place. Therefore, tests and assignments may be returned to students during class/lab, or during office hours, or via the Department Office (Admin 255), or will be made available only for viewing during exam review sessions scheduled by the Department. Tests and assignments will be shredded after one year. Instructors should take care to not link students' names with their grades, UCIDs, or other FOIP-sensitive information.

### **Course Credits for Research Participation (Max 2% of final grade)**

Students in most psychology courses are eligible to participate in Departmentally approved research and earn credits toward their final grades. **A maximum of two credits (2%) per course, including this course, may be applied to the student's final grade. Students earn 0.5% (0.5 credits) for each full 30 minutes of participation.** The demand for timeslots may exceed the supply in a given term. Thus, students are not guaranteed that there will be enough studies available to them to meet their credit requirements. Students should seek studies early in the term and should frequently check for open timeslots. Students can create an account and participate in Departmentally approved research studies at <http://ucalgary.sona-systems.com>. The last day to participate in studies and to assign or reassign earned credits to courses is **Dec 8, 2015**

### **Evacuation Assembly Point**

In case of an emergency evacuation during class, students must gather at the designated assembly point nearest to the classroom. The list of assembly points is found at

<http://www.ucalgary.ca/emergencyplan/assemblypoints>

Please check this website and note the nearest assembly point for this course.

### **Student Organizations**

Psychology students may wish to join the Psychology Undergraduate Students' Association (PSYCHS). They are located in Administration 170 and may be contacted at 403-220-5567.

**Student Union VP Academic:** Phone: 403-220-3911

[suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)

**Student Union Faculty Rep.:** Phone: 403-220-3913

[socialscirep@su.ucalgary.ca](mailto:socialscirep@su.ucalgary.ca)

### **Student Ombudsman's Office**

The Office of the Student Ombudsmen provides independent, impartial and confidential support for students who require assistance and advice in addressing issues and concerns related to their academic

careers. The office can be reached at 403-220-6420 or [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca) (<http://www.su.ucalgary.ca/services/student-services/student-rights.html>).

### **Safewalk**

The safewalk program provides volunteers to walk students safely to their destination anywhere on campus. This service is free and available 24 hrs/day, 365 days a year.

Call 403-220-5333.

### **Important Dates**

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **September 18, 2015**. Last day for registration/change of registration is **September 21, 2015**. The last day to withdraw from this course is **December 8, 2015**.