

Syllabus: Fall 2016 3000 & 3000H

Course: Physics 3000 & 3000H Sections 1, 2

Title: Introduction to Research

Credits: 2 credit hours

Instructor: Dr. Jens Oberheide, Dept. of Physics and Astronomy
Office hours are by request. Just send an email
email: joberhe@g.clemson.edu
Dr. Hugo Sanabria, Dept. of Physics and Astronomy
Office hours are by request. Just send us an email.
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Class Time: Wednesdays @ 12:20-1:10 pm: **Room 101 Kinard**
Students should give the instructor/speaker 15 minutes before dismissing.

Colloquium Time: Typically Thursdays @ 4-5 pm, **Room G001** (or TBA) Kinard
Refreshments served either before or after colloquium

Course Description: *Introduction to Research*

Acquaints students with current research in in the Department of Physics and Astronomy. Seminars are provided where research activities in various areas of Physics and Astronomy are summarized. Various faculty members will be recruited to give a brief (≈ 30 minutes) overview of their research and opportunities for student projects within their research group. This course should provide a basis to enable the students to choose a suitable topic for a senior thesis project. (Schedule of talks in progress.)

Prerequisites: (Level: Sophomore/Junior standing for Majors in Physics & Astronomy)

Textbooks: Required (None)

Grading Policy: (Phys. 3000, 3000H: Undergraduate Students)

90 - 100: A
80 - 89: B
70 - 79: C
60 - 69: D
0 - 59: F

70%: Research Reports and Summaries (Described Below)

30%: Class and/or Colloquium Attendance

Class Attendance:

Each student in Physics 3000 is expected to attend class (since we only meet once per week). It is essential that the students attend the presentations in order to be able to provide a write up as described

below. If you do not attend the class presentation, **a report will not be accepted**. Unless under very special circumstances, for which the instructors should be notified in advance.

There will be **N number of in Class presentation** dates scheduled. We will use the **top N-1** of these in determining your attendance grade, i.e., we will drop the lowest grade (or an absence for example). The same will be applied to Colloquium attendance.

Colloquium Attendance and Summaries:

Each student who is signed up for the Phys. 3000 & 3000H is required to attend as many colloquia as possible. There will be **N number of Colloquium presentations** dates scheduled. We will use the **top N-1** of these in determining your attendance grade, i.e., we will drop the lowest grade (or an absence for example). You will write up a short abstract/summary ($\approx 1/2$ page) including: the class, date, your name and the Colloquium speaker and topic. This will be how we will record attendance. **They must be handed in before departing the Colloquium room.**

Research Reports, Summaries & Attendance: (for 3000 & 3000H)

Seminars are provided where research activities in various areas of Physics and Astronomy are summarized. Various faculty members will be recruited to give a brief (≈ 30 minutes) overview of their research and opportunities for student projects within their research group. The specific grading procedure that will be used will be discussed in class on our first day of class. In the event of an emergency, the student should make direct contact with the course instructor, preferably before a class or presentation takes place. Students should speak with their course instructors regarding any scheduled absence as soon as possible and develop a plan for any make-up work.

Expectations & Requirements:

- (1.) The students will participate in the presentations and overviews of the respective research areas. Students are encouraged to interact and ask questions of the faculty members presenting.
- (2.) The students will provide a summary research report of the presentation. The report will be a minimum of 1.5 - 2 typed pages, double-spaced, (eg. #12 Times New Roman). The two pages are without figures (if you choose to include some) but include the references. Figures are not a requirement. See the specific instructions for the write-up that were sent to you by email. The report will be due the following class period after the lecture.

This will include a:

- (a) Title,
- (b) Faculty Presenter,
- (c) Student's Name
- (d) Synopsis of Presentation (2-3 sentences),
- (e) A summary of 1-2 paragraphs of what you learned from the presentation, including the experimental or theoretical techniques involved, and some of the important results presented.
- (f) A summary from further reading of a **minimum of 2 references** that expands on the research topic presented. The students will present a further discussion of the research topic and important questions that this area of research addresses.
- (g) References: The references are to be included in the report. Figures may also be used in the writeup. (please reference the source – see below).

Use scientific reference/citation styles, that is, don't give us the web address from where you downloaded it, but how you would cite the paper in a scientific journal. I give you an example for a paper by Willitsch et al. from one of the past presenters. In your text, refer to it as Willitsch et al. (2008). In the references, refer to it as:

S. Willitsch, M. T. Bell, A. D. Gingell, and T. P. Softley, *Chemical applications of laser- and sympathetically-cooled ions in ion traps*, Phys. Chem. Chem. Phys., 10(48), 7189-7336, doi:10.1039/B813408C, 2008.

The citation style can vary somewhat from one journal to another (it's usually provided in the paper). For example, some journals do not provide page numbers. The nomenclature in the example is as follows:

Author list, article title, journal abbreviation, volume(issue), pages, digital object identifier, year.

With this information, one can always find the article, for example using the web of science. The web of science is the method to find scientific articles using several search criteria, much better than google. Go to <http://thomsonreuters.com/web-of-science/> and click on product login. Clemson has a subscription and it should work if you are within the Clemson network. Also, if you know the digital object identifier (DOI), you can directly access the paper: <http://dx.doi.org/10.1039/B813408C> The 10.1039 is the journal ID and B8... the paper ID. Very convenient.

Very important: **Wikipedia is NOT an acceptable reference for the write-up!** You are required to provide references from the peer-reviewed scientific literature. Web pages are also not allowed. You can provide them but they do NOT count towards the 2 reference requirement.

See Write-up Instructions (attached)

Phys. 3000H Honor's Credit:

For those receiving Honor's Credit we require you to pick one of the presentation topics and go and talk to and interview the specific faculty member about their research. You will then comprise a **5-6 page paper** on this topic from further reading including a **minimum of 5 references** that is a short review on the topic and research that was presented. The references are to be included in the report. Figures may also be used in the write-up (please reference these). Dr. Oberheide should be notified as soon as possible to the title and abstract of the topic each Honor's student has chosen. **These papers will be due by Friday November 18, 2016**, via email to Dr. Oberheide at joberhe@g.clemson.edu.

Statement of Integrity:

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a high seminary of learning. Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

Policy Statement:

It is university policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students with disabilities requesting accommodations should make an appointment with Dr. Margaret Camp (656-6848), Director of Disability Services, to discuss specific needs within the first month of classes. Students should present a Faculty Accommodation Letter from Student Disability Services when they meet with instructors. Accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester.

Copyright Statement

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Title IX:

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