

Physics 586 Course Information

- **Course Content**

Physics 586 is a one semester course focusing on the physics of particle detectors. The goals of the course are to understand the physics, detection, and applications of ionizing radiation. Applications will be drawn from both high energy physics and radiological physics. The course will cover the interactions of charged and neutral particles with matter and the principles of a wide variety of particle detectors. Some of the course content will be driven by student interest. An important component of the course is lab work where you will gain hands-on experience with a number of different particle detectors. At the end of the course you should be able to walk into any high energy physics experiment or radiation therapy lab and have a good understanding of the physics of the particle detectors and accelerators used.

- **Instructor**

Prof. Kenneth Johns (Experimental Particle Physics Group)

- **Contact**

Email johns@physics.arizona.edu or phone 621-6791 or visit my office PAS 454.

- **Class Hours**

Lecture Monday and Wednesday 1100-1150 in PAS 316

Lab times TBD in PAS 468

- **Office Hours (PAS 454)**

Tuesday afternoon 1400-1600

You are strongly encouraged to use the scheduled office hours but walk-ins at other times are welcome too. Occasionally this semester I may travel to experiments I am working on and will be unavailable except by email.

- **WWW Information**

Course information can be found on the D2L web site for Phys 586 at <http://d2l.arizona.edu/>. Here one can find links to reading, lab, and homework assignments, scanned lecture notes, homework solutions, and class news. There are also links to useful sites related to this course.

- **Texts (Required)**

“Radiation Detection and Measurement” by Knoll (2000)

- **References**

Other texts you might find helpful are:

“Particle Detectors” by Grupen and Shwartz (2008)

“Techniques for Nuclear and Particle Physics Experiments” by Leo (1994)

“Introduction to Experimental Particle Physics” by Fernow (1986)

“Introduction to Radiological Physics and Radiation Dosimetry” by Attix (2004)

“Radiation Therapy Physics” by Hendee, Ibbott, and Hendee (2005)

“The Physics of Radiation Therapy” by Khan (2010)

“Review of Particle Physics” by the Particle Data Group at http://pdg.lbl.gov/2009/reviews/contents_sports.html

- **Lectures**

There will be two one-hour lectures each week. We may occasionally make use of the Friday hour for make-up lectures in case of instructor absence due to research travel.

- **Class Notes**

Class notes are available in PDF format from the Phys 586 web site. While I try to have the notes available before each class this is not guaranteed.

- **Homework**

There will be a relatively small number of homework problems in the course. Most will consist of back-of-the-envelope calculations.

- **Talks**

Each student will be required to give two-three 15 minute talks during the semester. The topics are to be decided and will supplement material we are covering in class.

- **Laboratory**

Laboratory work is an important aspect of the course. You should purchase a bound lab notebook to record data and its subsequent analysis. You should treat the labs as you would any research project and document your work accordingly. A short lab write-up will be due a week after each lab is completed. Labs will be held in PAS 468.

- **Exams**

There will be one exam, the final. It will be a comprehensive exam. The date of the final will be announced later but will take place during finals week.

Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements must register with the Disability Resource Center. If you qualify for services through the Disability Resource Center, please bring me your identification letter within the first few days of

the course start date.

- **Grading**

The course grade will be determined using the following weights:

Homework	10%
Talks	20%
Laboratory	45%
Final Exam	25%

- **Student Conduct**

Students are expected to follow the University code of academic integrity and code of student conduct. These can be found at <http://deanofstudents.arizona.edu/policiesandcodes>.

- **Additional Information**

No material will be accepted two weeks after its due date. No material will be accepted after the last day of class.



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