

## SYLLABUS

### PHZ 7357, ELEMENTARY PARTICLE PHYSICS 2

Instructor: Prof. Sergey Klimenko, Office: NPB 2019, phone 352-392-9225  
email: [klimenko@phys.ufl.edu](mailto:klimenko@phys.ufl.edu), class is in room NPB 1200, MWF, starting at 5:10pm. Office hours: after the class or by appointment.

This course is the second part of the two-semester course PHZ 6355/7357. The course PHZ 7357 is taught from the phenomenological and experimental perspectives, covering more in depth the underlying theoretical and experimental concepts in particle physics. The first part PHZ 6355, which gives introduction to the history and basic ideas in particle physics and experiment, is a pre-requisite for PHZ 7357.

Topics to be covered by PHZ 7357.

- Space-time symmetries, classification of particles
- Discrete symmetries, CP violation in the Standard Model and beyond.
- The quark model.
- Quantum Electrodynamics, electron-positron annihilation
- Quantum Chromodynamics, jets and gluons
- Weak interactions, quarks and leptons, Cabibbo mixing
- Electroweak unification, neutral currents, gauge invariance and the Higgs Boson
- The Standard Model, precision tests
- Beyond Standard Model, dark matter, neutrino mixing and oscillations.

List of topics may be expanded depending on the interests of the students.

#### **Required textbook:**

- Particle Physics, B.R. Martin & G.Shaw, 4<sup>th</sup> edition, John Wiley & Sons

#### **Additional reading**

- The Experimental Foundation of Particle Physics, R. Cahn and G. Goldhaber, 2<sup>nd</sup> edition, Cambridge University Press

- Introduction to Elementary Particles, D. Griffiths, 2<sup>nd</sup> edition, Wiley-VCH
- Handout notes will be provided for extra material

**Sample HW problems** (the HWs will include some problems from the textbook and may include additional problems as well).

GRADING. Grades will be based on your homework assignments (one HW every two-three weeks), two partial tests (one in the middle of the semester, one in the end) and quick quizzes in class. The tests will be 20% of your grade each, the homework 50%, and in class quick quizzes 10%. There will be bonus questions in the HW and tests.

Late homework:

- -50% (within 7 days)
- homework overdue by more than one week will not be graded and no makeups will be possible except extraordinary circumstances

Your final grades will be based on the percentage from the maximum possible total score:

<b>grade</b>	<b>A</b>	<b>A-</b>	<b>A+</b>	<b>B</b>	<b>B-</b>	<b>C+</b>	<b>C</b>	<b>D</b>
<b>score</b>	<b>80%</b>	<b>75%</b>	<b>70%</b>	<b>65%</b>	<b>60%</b>	<b>50%</b>	<b>40%</b>	<b>20%</b>

For additional details regarding grading policies, please, see the university website:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

**Requirements for Class attendance and make-up** exams, assignments and other work in this course are consistent with the university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

**Students with disabilities** requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/) ) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor

when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

**Students are expected to provide feedback** on the quality of instruction in this course by completing the online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>

**UF students are bound by The Honor Pledge** which states “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. The Honor Code can be found here: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

### **Counseling and Wellness Center**

Contact information for the Counseling and Wellness Center:

<http://www.counseling.ufl.edu/cwc/Default.aspx> (392-1575),  
and the UF Police Department: 392-1111 or 911 for emergencies.