Text (REQUIRED):
1. *Introductory Nuclear Physics*, Samuel S.M. Wong

Supplementary text:
*Nuclear Physics in a Nutshell*, C. Bertulani

Course time and date: Monday, Wednesday 11.00-12.23 (P123)
Office hours: Wednesday 2-3pm (C109)
Course URL: http://skipper.physics.sunysb.edu/~joanna/Lectures/PHY551/

Topics:

Introduction
1. What is Nuclear Physics?
2. History and Overview

Neutron Structure
1. Quark Parton Model
2. Magnetic Moments and Spin structure
3. Confinement of Quarks and Gluons

Nuclear Force and Two-Nucleon Systems
1. Deuteron
2. Symmetry and Nuclear Force
3. Nucleon-Nucleon Scattering

Properties of Nuclei
1. Form factors, Charge Radius and Charge density
2. Deep Inelastic Lepton-Nuclei Scattering, structure functions
3. Nuclear Shape and Electromagnetic Moments

Models of Nuclear Structure
1. Liquid Drop Model
2. Fermi Gas-Model
3. Nuclear Shell Model

Nuclear Excitations
1. Collective Modes of Motion: Nuclear Vibrations and Rotations
2. Deformed and Extremely Unstable Nuclei

Nuclear Decay and Radioactivity
1. Radioactive Decays
2. \( \alpha, \beta, \gamma \) Decay

Nuclei Under Extreme Conditions
1. Relativistic Heavy Ion Collisions
2. Phase Transition and Quark Gluon Plasma

**Nuclear Astrophysics**
1. Stellar Evolution
2. Solar Neutrino Problem

**Nuclear Physics: Present and Future**

**Homework:** every 2 weeks, 2 weeks to turn it in. **No credit for late homework.** Students are encouraged to work together, but write up should be their own (copies will be disqualified). Any (serious!) excuses (medical or otherwise) are to be documented and discussed with the instructor in a timely manner.

**Exams:** There will be two midterm exams and a final exam (final exam covers the whole course material). Midterm exams will be given during the regular lecture hours.

**Grading:** Your final course grade will be determined by weighting the various portions of the course as follows:

- 40% midterm (20% each)
- 20% homework
- 40% final

**ACADEMIC INTEGRITY**
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at [http://www.stonybrook.edu/uaa/academicjudiciary/](http://www.stonybrook.edu/uaa/academicjudiciary/)

**ELECTRONIC COMMUNICATION**
Email to your University email account is an important way of communicating with you for this course. For most students the email address is ‘firstname.lastname@stonybrook.edu’, and the account can be accessed here: [http://www.stonybrook.edu/mycloud](http://www.stonybrook.edu/mycloud). *It is your responsibility to read your email received at this account.*

For instructions about how to verify your University email address see this: [http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo](http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo). You can set up email forwarding using instructions here: [http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail](http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail). If you choose to forward your University email to another account, we are not responsible for any undeliverable messages.
RELIGIOUS OBSERVANCES
See the policy statement regarding religious holidays at http://www.stonybrook.edu/registrar/forms/RelHolPol%20081612%20cr.pdf
Students are expected to notify the course professors by email of their intention to take time out for religious observance. This should be done as soon as possible but definitely before the end of the 'add/drop' period. At that time they can discuss with the instructor(s) how they will be able to make up the work covered.

DISABILITIES
If you have a physical, psychiatric/emotional, medical or learning disability that may impact on your ability to carry out assigned course work, you should contact the staff in the Disability Support Services office [DSS], 632-6748/9. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the website http://www.sunysb.edu/ehs/fire/disabilities.shtml

CRITICAL INCIDENT MANAGEMENT
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the University Police and the Office of University Community Standards any serious disruptive behavior that interrupts teaching, compromises the safety of the learning environment, and/or inhibits students’ ability to learn. See more here: http://www.stonybrook.edu/sb/behavior.shtml