Spring 2016, Mystery of Matter: PHY 313 and CEI 544
When: Wednesday 5:30-8:30PM
Where: Melville Library, W4525
Who: Prof. Abhay Deshpande

This class deals with a) exploration of our understanding of the basic constituents of matter and b) how that understanding and c) the tools developed to study them affect aspects of contemporary society. Historical discoveries and their place in social and political institutions of the time are considered, along with the issues of government funding and cost to the society. We will also include discussions on developments at Brookhaven National Laboratory (Upton, NY) and Thomas Jefferson National Laboratory (Newport News, VA) their scientific and social impact.

This course is not intended for physics and astronomy majors with U3 or U4 standing.

Pre-requisite: U3 or U4 standing in non-physics/astronomy majors; one D.E.C. E or SNW course. All physics and astronomy majors need explicit permission to enroll. Please consult Prod. Abhay Deshpande followed by the Director of UG Studies Prof. Robert McCarthy.
Lecture Schedule

Most material for this course can be found on the Web. The links below represent specific material that will be covered in the lecture. Links will become alive during the semester with lectures. Links below do not constitute lectures but rather material covered in or for the lectures.

January 27, 2016
Course Introduction
Nature catches of with the 19th century physics. Light: Waves or Particles?
Homework

February 3, Week 2
Quantum Mechanics: particle waves, quantum numbers, wave function & uncertainty principle
Homework

February 10, Week 3
Discovery of nucleus, its size and radioactivity
Homework

February 17, Week 4
Structure of nucleus, nuclear decay, superheavy elements and effects of radioactivity
Homework

February 24, Week 5
Nuclear fission, fusion, nuclear reactors, nuclear bombs, proliferation & fusion energy
Homework

March 2, Week 6
Nuclear fusion and fission energy, how stars work including their birth, life and spectacular death

March 9, Week 7

March 16, Week 8

March 23, Week 9

March 30, Week 10

April 6, Week 11
April 13, Week 12
April 20, Week 13
April 27, Week 14
May 4, Week 15
May 11, Week 16
You should know

Americans with Disabilities Act:
If you have a physical, psychological, medical or learning disability that might impact your course work, examination taking abilities, please contact Disability Support Services (DSS). Educational Communication Center (ECC) Building Room 128 (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with the professors and DSS. For procedures and information see: http://www.sunysb.edu/ehs/fire/disabilities.html

Religious Holidays:
Homework are due weekly and there will be extra credit for quizzes occasionally, mostly unannounced. If you are planning to be absent due to conflict with your religious holidays, let Prof. Deshpande know during the first week of classes. We will make every effort to accommodate your needs. However, beyond 1st week, there will be no opportunity to be counted. No changes will be made to the class schedule, but extra time would be allotted according to the person’s need. This policy of declaring your absence in the 1st week of the class will be strictly enforced.

Academic Integrity:
Each student must pursue his/her academic goals honestly and be personally responsible for submitted work. Representing other person’s work as your own is always wrong. Faculty are required to report any suspicious activity of academic dishonesty to the Academic Judiciary. For comprehensive information on academic integrity, including categories of academic dishonesty please refer to: University’s web site on academic dishonesty.

Crisis Incident Management:
Stony Brook University expects students to respect the rights and privileges and property of other people. Faculty are required to report to the office of Judicial affairs any disruptive behavior that interrupts their ability to teach, compromise the safety of learning environment or inhibit student’s ability to learn. Faculty at HSC school and the school of Medicine are required to follow their school specific procedures.