

# **EE480 –Introduction to Nanoscience and Nanotechnology**

**Tuesday and Thursday, 2 – 3:30 pm  
KAP163**

**Chongwu (Dave) Zhou  
Professor**

**Department of Electrical Engineering  
University of Southern California**

**Course catalog description:** This class will present students with various aspects of active research on next-generation nanoscale materials and electronic devices. Topics include nanomaterials, nanofabrication, nanoelectronics, and bionanotechnology. The practical impact and ongoing commercialization of nanotechnology will also be discussed.

**Motivation:** This class is designed for senior undergraduate students, Master students, and also PhD students. Nanoscience and nanotechnology have become an important focus of today's scientific research. This class will serve to introduce the students to this interdisciplinary field and stimulate their interest for further study of this field.

**Instructor:** Chongwu (Dave) Zhou, Department of Electrical Engineering

**Class Hours:** T, Th, 2 – 3:20 pm

**Office Hours:** Tuesday 1 - 2 pm, RTH 511

**Teaching Assistant:** TBA

**TA office hour:** Thursday 1 – 2 pm, RTH B105

**Course Formats:** Lectures and Seminars.

**Textbook** Carbon Nanotube and Graphene Device Physics  
By H.-S. Philip Wong and Deji Akinwande

**Prerequisite:** Physical Electronics (EE338), or Modern Solid State devices (EE537)

**Grading:** Homework 20%; Midterm 30%; Final exam 30%; In-class presentations and reports 20%.

**Final exam:** Thursday, May 4, 2-4 pm.

## Course Contents (tentative)

1. Introduction to nanomaterials
2. Introduction to nanofabrication
3. Electrons in solids: a basic introduction
4. Graphene I: band structures
5. Graphene II: synthesis, properties, and applications
6. Carbon nanotube band structure I
7. Carbon nanotube band structure II
8. Carbon nanotube equilibrium properties
9. Carbon nanotube field-effect transistors I
10. Carbon nanotube field-effect transistors II
11. Applications of carbon nanotubes
12. Two-dimensional materials
13. Zero-dimensional quantum dots
14. Bionanotechnology

### Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

### Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://www.usc.edu/dept/publications/SCAMPUS/gov/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.