M.S. Materials Science and Engineering

The Master of Science degree Program in Materials Science & Engineering (MSE) is an interdisciplinary program that provides a rigorous education in the fundamentals of both Materials Science and Materials Engineering. The curriculum will include a core of materials science courses covering the structure, properties, processing, and performance of materials. The core will be supplemented by electives in materials chemistry, solid state physics, biomaterials, or engineering materials.

Admission to the Program

In addition to University requirements for admission to graduate study, applicants must have a baccalaureate of science degree in mathematics, natural sciences, or engineering with minimum 3.0 GPA to be considered for acceptance to the department.

Requirements for the Degree (30 units)

A total of 30 units is required, with at least 18 in 5000-level courses.

Required Courses (16)

- ENGR 4970 Seminar in Interdisciplinary STEM Research, prerequisite Senior undergraduate or graduate standing (1)
- MSE/ME 4141, Engineering of Materials, prerequisite MATH 2150 (3)
- MSE/CHEM/PHYS 4142, Chemistry and Physics of Materials, prerequisite MATH 2150 (3)
- MSE/ME5140, Mechanical Behavior of Materials, prerequisite ME 4141 (3)
- MSE/CHEM 5510, Thermodynamics and Kinetics of Materials, prerequisite CHEM/PHYS 4142 (3)
- MSE/PHYS 5330, Electronic and Magnetic Properties of Materials, prerequisite CHEM/PHYS 4142 (3)

Elective Courses (8-14 units)

Select 8-14 units from the following 5000 and 4000 levels courses with consultation and approval of advisor. Electives must include at least 6 units of 5000-level courses and must be chosen in consultation with advisor.

1. CHEM 4410 Physical Chemistry: Quantum Mechanics (4)
2. CHEM 4420 Physical Chemistry: Thermodynamics (3)
3. CHEM 4430 Quantum Chemical Methods (1)
4. CHEM 5040 Advanced Inorganic Chemistry (3)
5. MSE/ME 4020 Advanced Mechanics of Materials (3)
6. ME 414 Machine Design II (3)
7. MSE/ME 4300 Selection and Properties of Materials (3)
8. ME 4310 Material Laboratory (1)
9. MSE/ME 4510 Biomaterials (3)
10. MSE/ME 5130 Advanced Structure of Materials (3)
11. ME 5300 Advanced Manufacturing Processes (3)
12. PHYS 4200 Computational Physics (3)
13. PHYS 4251 - Introduction to Theoretical Physics
14. PHYS 4261 Electricity and Magnetism (2)
15. PHYS 4280 Statistical Thermodynamics (3)
16. PHYS 4321 Introductory Quantum Mechanics I (3)
17. PHYS 4330 Solid State Physics (3)
18. PHYS 4700 Advanced Physics Laboratory (3)
19. PHYS 5101 Mathematical Methods of Physics (3)
20. PHYS 5731 Theory of Nuclear Magnetic Resonance and its Applications to Materials Physics (3)
21. PHYS 5732 Practical Implementation of Nuclear Magnetic Resonance and Applications to Materials Physics (1)

Supervisory Courses (0-6 units):

1. Comprehensive Examination, ME 5960 (0)
2. Graduate Research ME 5970 (1 to 3)
3. Graduate Directed Study ME 5980 (1 to 3)
4. Thesis ME 5990 (3)

Comprehensive Examination or Thesis (3 units)

Students may either select thesis or comprehensive examination option with advisor approval. Students who select comprehensive examination should take the examination during the last week of the semester they complete all courses in their study plan.

Advancement to candidacy is required of all students to be eligible to register for culminating experience supervisory courses Thesis Option ME 5990 and Comprehensive Examination ME 5960. Advancement to candidacy requirements are:

- Completion of all required courses (6 courses) with a grade of B or better within maximum of 5 years from the date of articulation in the MSE program.
- Minimum GPA of 3.0.
- Completion of Graduate Writing Proficiency requirement.
- Completion of minimum of 15 units in residence at Cal State LA.

Upon advancement to candidacy, students may formally apply for the culminating experience by filling out the designated form.