

# SYLLABUS

SEC 205, TUES – FRI 10:20 – 11:40 AM

1. **Course Number and Name:** 14:635:203 – Introduction to Materials Science and Engineering
2. **Credits and Contact Hours:** 3 credits, 45 contact hours
3. **Instructors' Names:** Dr. Kim-Phuong Le
4. **Textbook, Title, Author, and Year (recommended):**

Materials Science and Engineering: An Introduction. W. D. Callister, D. G. Rethwisch. 9<sup>th</sup> Ed., John Wiley and Sons, New York (ISBN 978-0-470-41997-7)

5. **Specific Course Information:**

This is an introductory, **required** course for second year students in the Department of Materials Science and Engineering (MSE). This course lays the foundations for the subsequent more advanced courses, and requires the previous knowledge acquired in *freshman calculus, chemistry, and physics*.

**Prerequisites:** *Freshman chemistry, calculus, and physics*

6. **Specific Goals for the Course:**

The students will gain overview knowledge of polymers, metals and ceramics, along with some additional focus on biomaterials. They will learn the fundamental properties of materials, phase diagrams and the concepts of degradation and failure. At the end of this course the student will be familiar with the basic notions required to attend the more advanced courses of the MSE curriculum.

Aside from technical knowledge, the students will also obtain from this course the appreciation of effective teamwork, communication, and professional ethics.

7. **Brief List of Topics:**

- Atomic structure and interatomic bonding
- Introduction to polymers: structures, properties, processing and applications
- Introduction to metals: structures, properties, processing and applications
- Introduction to ceramics: structures, properties, processing and applications
- Introduction to biomaterials
- Stress and strain
- Phase diagrams
- Defect, deformation and failure
- Thermal, magnetic, electrical and optical properties

# SYLLABUS

SEC 205, TUES – FRI 10:20 – 11:40 AM

## 8. Assessment and Grading:

The assessment will be based on the following:

1. Midterm exams (2 x 20%)
2. Final exam (35%)
3. Presentation (group, 20%)
4. Attendance (5%)

## 9. Additional Learning Tools:

Peer-reviewed journal articles, case studies

## 10. Office Hours:

Wednesday CCR 212 10 - 11 am

## 11. Code of Conduct / Professional Ethics:

Any academic dishonesty will result in dismissal from the class, an automatically failing grade in the course and a report to the department chair for further disciplinary action.

It is ethical and professional to report the actual level of contribution on group presentation. The students are expected to seek agreement from the group and report this actual level of contribution at the time of the presentation.