



IET307- 001—MATERIALS SCIENCE
Department of Applied Engineering & Technology
College of Science and Technology
Morehead State University
ATME accredited program
Fall 2010 Syllabus



INSTRUCTOR: Dr. Rajeev Madhavannair, Rm. LC-301. Tel: 606-783-2681.
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TIME : Hybrid (Online plus optional demo labs)

OFFICE HOURS : M, W 10:30 AM – 12.30 PM or by appointment.

TEXTBOOK: Materials Science & Engineering: An Introduction,
W. D. Callister, 7th edition, John Wiley & Sons
ISBN-13: 978-0-471-73696-7

RESERVE MATERIALS

1. Materials Science in Engineering, by Carl A. Keyser, 4th edition, Merrill Publishing, 1986
2. The Principles of Materials Selection for Engineering Design, by Pat L. Mangonon, Prentice-Hall, 1999

PREREQUISITES: MATH 152 or higher, and PHYS 201. It is very important that students in this course have completed the appropriate math course in order to be successful in this course. Please contact me if you have any concerns on this score.

ONLINE INFORMATION:

My Email: r.madhavann@moreheadstate.edu

Student E-mail – do the following option:

Create an MSU web-based e-mail account - go to <http://mail.morehead-st.edu> - to “self-create” a web e-mail account and PIN, go to www.morehead-st.edu/intranet/students/ and click on “I need to create a Web account.”

IMPORTANT:

- You are **registered** for this class at MSU but you **MUST ALSO ELECTRONICALLY ENROLL** for the class online at <http://www.morehead-st.edu/units/distance/> (It is now done automatically).
- Enrolling in the Blackboard IET 307 course is not optional and **MUST** be completed immediately.
- Click on **Online Courses** on the left-side menu (second choice under Main Areas).
- Click on **Process of enrolling in an online course** and follow instructions.

- If you already are familiar with this online enrollment process, go directly to Blackboard to LOGIN and enroll at <http://online.moreheadstate.edu/>.
- To access the IET 307 course web page, go to <http://online.moreheadstate.edu/>.

COURSE DESCRIPTION: Materials Science (2-2-3); I, II. An organized investigation of engineering materials, including their classification, properties, and means of testing to determine their properties. The application of materials to manufactured products and to construction, and the effects of both manufacturing processes and in-service stress on materials will be considered.

COURSE OBJECTIVES: This course has been revised and upgraded to an upper-division level. The course will provide the student with basic knowledge of engineering materials, applications of these materials in the manufactured and built environment, and the testing procedure needed to determine the fitness of materials for various applications, or the quality of the manufacturing process that the materials undergo.

LEARNING OBJECTIVES:

After satisfactory completion of this course, the student will:

1. Develop an understanding of engineering materials concepts that demonstrates a quantitative and analytical grasp of the most important concepts.
Means of assessment: Homework #1 – 10, quiz # 1 and 2, Midterm, Final, and Material selection/ Substitution Project Report
2. The students will have an understanding of atomic and crystal structure and chemical bond types, and understand how they affect material properties
Means of assessment: (HW#1, QZ#1)
3. The students will have an understanding of mechanical, properties of materials and why a specific material is suited for particular applications.
Means of assessment: (HW# 2, Midterm and Final)
4. The students will have a basic understanding of the tools, standards and procedures for testing materials properties.
Means of assessment: (HW# 3, Midterm and Final)
5. The students will have an understanding of materials classification and the engineering application of materials.
Means of assessment: (HW# 4 to 10, Qz#2, Midterm, Final, Project)
6. The students will have had opportunities to further their professional development through working on course assignments and practicing written and graphical communication skills, and develop the capability of making scientific decisions involving materials selection and testing.
Means of assessment: (HW# 1-10, Qz#1-2, Midterm, Final and Project)

WEEK	TOPIC
# 1	Chapter 1, Classification of materials, Advanced materials
# 2	Chapters 2 & 3, Fundamentals of Materials Science: Atoms, electrons and bond types, and crystal structure, Homework#1
# 3	Chapter 4, Imperfections in solids: Defects and dislocations, Generalized Hooke's law and constrained materials, Homework#2
# 4	Chapter 6, Mechanical properties: Tensile, hardness and impact, Quiz#1 , Optional lab visit, Homework#3
# 5	Chapter 7, Slip systems, twinning, mechanisms for strengthening, recovery, recrystallization and grain growth, Homework#4
# 6	Chapter 8, Failure: Fracture, fatigue and creep, Homework#5
# 7	Chapter 11, Metal alloys, processes, heat treatment, Homework#6
# 8	Mid-term Exam
# 9	Chapter 12, Structure of ceramics, Optional lab visit
# 10	Chapter 13, Processing ceramics, Homework#7
# 11	Chapter 14, Polymer structures
# 12	Chapter 15, Characteristics, applications and processing of polymers, Optional lab visit
#13	Chapter 15, Polymer types, Homework#8
#14	Thanksgiving
# 15	Quiz#2 , Chapter 16 - Composites, Optional lab visit, Homework#9
# 16	Chapter 17, Corrosion and degradation of materials, Final Project , Homework#10
# 17	Final Exam

Grading Assignments/Exams:

All assignments will be graded and returned to students with the detailed solutions and explanations within 3 days of the acceptance of all the submissions by students. The instructor will provide necessary and relevant comments to assist students in understanding. Once an item is returned, students are encouraged to ask for a review of any graded work, if it is felt the grade received was not appropriate or accurate. Within 2 days of receiving the graded assignment, the work in question must be returned by the student with a written or oral statement of explanation. This statement must be justified and supported by lecture notes, textbook, or other material from class. The final decision for the grade on all student assessment items is the responsibility of the class instructor.

Grading System:

Homework (10)	25%	200
Quizzes (2)	15%	150
Midterm	20%	200
Final	25%	300
Project	10 %	100
Portfolio & DB	05 %	50
TOTAL	100%	1000 POINTS

GRADING SCALE:

90%-100%	900 – 1000	A
80%-89.9%	800 – 899	B
70%-79.9%	700 – 799	C
60%-69.9%	600 – 699	D
<60%	<600	E

Academic Honesty:

Cheating, fabrication, plagiarism or helping others to commit these acts will **not** be tolerated. Academic dishonesty will result in severe disciplinary action including, but not limited to, failure of the student assessment item or course, and/or dismissal from MSU. If you are not sure what constitutes academic dishonesty, read **The Eagle: Student Handbook** or ask your instructor. The policy is located online in the “Student Conduct Code” at: <http://www.moreheadstate.edu/units/studentlife/handbook/index.html>. **Note:** Copying information from the Internet is plagiarism if appropriate credit is not given.

Policy for Accommodating Students with Disabilities:

In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. It is the student’s responsibility to inform the instructor of any special needs before the end of the second week of class.

Campus Safety Statement:

Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at www.moreheadstate.edu/emergency

Portfolio:

At the end of the semester, students will have carefully prepared a course E-portfolio containing all course materials in an organized and professional format and placed on a CD/DVD and send it to instructor.

Homework Policies:

No late assignment will be accepted. It is impossible to fairly evaluate students when assignments are completed at various times, therefore **I cannot accept assignments** even after one day late unless there are extenuating circumstances like immediate death in your family, medical reasons (with proper physicians certificate) or university approved function participation. Each day late is 10% reduction from full score and this includes Saturdays and Sundays.

E-mailing Policy and Format

Any kind of harassment will **NOT** be acceptable in communication between students and teacher and between students with each other. Please use the discussion board if you have question or a comment for the benefits of other students.

E-mail should be sent from your MSU e-mail account, any e-mail from personal account like yahoo, or, hotmail will be ignored because it goes directly to spam. In your e-mail the subject should be as following: **IET-307- (HW, Quiz, Exam, etc) - Your name.**

Exam & Quiz Policies:

It will NOT be fair to reset the exam or quiz for some students. It the student responsibility to assure a high speed internet connection before starting exam or quiz. If it is an emergency I will allow, only one time during the semester, make up for exam or quiz at MUS under my supervision.

To avoid any troubles during the exam or quiz please follow the instruction written at the beginning or each exam or quiz.

Course Requirements:

1. A high-speed internet connection. This course asks you to look at a lot of videos online, and it simply does not work with a dial-up connection at home. If you don't have a high-speed connection at home, you can still take the course by using one of the computers available to you either at Morehead State or one of its satellite campuses or may consider using the facilities at a public library.
2. The ability to complete your assignments on a weekly basis. There are many students who have been caught off-guard when they have tried to do their homework at the last minute, only to find servers down, or problems with the internet.
3. The ability to download audio and video files, and the ability to download certain applications.
4. I will give you more information regarding the individual project, lab demos, quiz's and exams as needed.