SECTIONS:
Section 01: Location ENGR 1.268 TR 8:00 – 9:15AM – Robert Jones, PhD
Section 02: Location ENGR 1.290 TR 9:25 – 10:40AM – Jazmin Ley, MSE
Section 03: Location ENGR 1.242 TR 10:40 – 12:05PM – Jazmin Ley, MSE

INSTRUCTORS:
Robert Jones, PhD.
Email: robert.jones@utrgv.edu
Office: EENGR 3.246
Office Hours: TR 9:30 – 11:00AM & W 10:30 – 12:00PM

Jazmin Ley, MSE
Email: jazmin.ley@utrgv.edu
Office: EENGR P1.104B (Portable)
Office Hours Edinburg: TR 8:30 – 9:05 AM
Office Hours Brownsville: Fridays by Appointment.

TEXT:

REQUIRED MATERIALS:
1. Smart Device or Cell Phone
2. MELearn Homework Page Webpage as well as BBLearn and YouTube.
3. Non-programmable calculator for exams (you will need this for other classes)
4. Ruler or Straight Edge
5. Print out of Equation Booklet for class.

COURSE PREREQUISITES: CHEM 1307/1107 (preferred) or 1301/1101

PREREQUISITE KNOWLEDGE
- Basic chemistry
- Algebra and Trigonometry
- Use of Computer Spreadsheets

GENERAL COURSE OBJECTIVES:
1. Introduce the fundamental concepts of materials science and the principle mechanical and physical properties of engineering materials including metals, polymers, and composites.
2. Explore advanced topics in long term durability of structures including corrosion and fatigue as well as examining the next generation of structural materials and their properties.
3. Develop the professional skills and mindset for good selection of materials and productive professional interaction with materials specialists in your future roles as design and project engineers.
COURSE OUTCOMES:
Students will be able to:

1. Utilize periodic table to determine atomic structure, elemental characteristics and bonding types between two elements. (HQT)
2. Identify the characteristic properties of the three major crystal structures. (HQT)
3. Specify x-ray or electron beam analysis techniques to solve materials problems. (QT)
4. Identify and solve diffusion problems using Ficke's 1st or 2nd laws. (HQT)
5. Explain elastic and plastic deformation and predict the effects of structure changes. (HQT)
6. Determine the major engineering constants obtained from a tensile stress strain curve. (HQT)
7. Predict failure of components using fracture mechanics principles. (HT)
8. Predict the fatigue life of a component using S-N techniques. (HT)
9. Apply constitutive models of creep and fatigue to life prediction of components and determine whether or not a material is likely to undergo creep at a specified temperature. (HT)
10. Determine the mode of failure of a component from surface features and micrographs. (QT)
11. Utilize phase diagrams to determine the state of an alloy and predict microstructures. (HQT)
12. Use TTT diagrams to predict microstructures from non-equilibrium processing. (HQT)
13. Explain the basic structure of polymers and relate structures to engineering properties. (HQT)
14. Interpret DSC and DMA results to determine the nature of a polymer sample. (QT)
15. Describe components of composites and use micromechanics to predict properties. (HQT)
16. Explain the mechanisms of corrosion, identify the anodic and cathodic components in a galvanic couple and design appropriate components or systems. (HQT)
17. Find specialized data and materials technology in monographs and product literature. (Q, P)
18. Interpret articles and announcements of new materials technologies in trade journals. (Q, P)
19. Understand processes of surface failure (wear, corrosion, surface fatigue) and determine microstructural and surface modifications to control failure. (HQT)
20. Calculate normal and shear stress, apply Hooke’s law and Poisson’s ratio to determine strain and calculate true stress and true strain.

Key: H - Homework, Q-Quiz, T-Test, P-Project

ATTENDANCE:
The classroom time is designed to cover the majority of the critical skills and knowledge needed for success in also be functioning as part of a team which will suffer if you are not present. Therefore, attendance is critical.

Attendance will be taken every time the class meets. Any student arriving to class 5 minutes after the class has started will not be allowed in class. Students will be allowed a maximum of three absences for the whole semester for classes meeting twice a week, two absences for classes meeting once a week, and one absence for laboratory courses. Five points will be deducted from the total (100%) for each absence exceeding the maximum allowable unless documentation justifying that absence is provided.

Students will not be permitted to leave the classroom during lectures and exams except for genuine emergencies. Going to the restroom does not count as an emergency unless you have a documented medical condition.

If roll is taken and you are not yet in the classroom when your name is called you will be marked absent. Furthermore, students receiving a grade lower than a 60 on the first midterm who have two or more unexcused absences will be administratively dropped from the course. Excused absences may be granted for documented health problems or for job or school related activities if prior notification (at least 48 hours in advance) has been given of the absence.
ELECTRONIC DEVICES IN CLASS:
Laptops, Cell phones or pad devices should be off and stowed during class except when Top Hat is being used. Picture taking during classes is not permitted and students may not record classes without prior approval from the instructor.

ASSIGNMENTS:
This course is information intensive and there is less opportunity for traditional engineering computation. Rather, you will be expected to connect concepts and identify solutions. In the real world, there are always multiple materials solutions to a problem so the critical skill this course seeks to develop is the ability to think through the requirements of the application and choose one of the better options from a group of acceptable choices. It is important that you fully grasp a core of principles and are familiar with a broad area of information. The latter is best done through the reading assignments and instruction videos. To assure that you are mastering the skills and concepts a combination of homework, daily quizzes, and midterm exams will be employed.

HOMEWORK:
Homework will be assigned primarily through the MELearn website. Because homework is so closely tied to student success, you will be expected to complete the assignments. Success on homework is mostly a question of effort. Therefore, if your homework average is below 60%, you may not be allowed to take the first semester exam.

NOTEBOOK / BINDER:
It will be due and graded during the final exam. It is wise in all classes to build and maintain a notebook to aid in your studying. It should contain: 1. Syllabus  2. Class Notes 3. Worked homework problems in standard format  4. Other quizzes and assignments 5. Midterm exams. Though you will be submitting your homework online, you will have to work out most of the problems on paper. You should keep those worked problems for review when preparing for exams. Notebooks will not be collected but they are a very good habit to develop.

READINGS AND PRECLASS ASSIGNMENTS:
To allow us to do more problems and case studies in class, you will be expected to do assigned readings and watch instructional videos through blackboard and come to class prepared for the topic at hand. To motivate you to do this, short homework assignments of mostly multiple choice questions will be assigned before every class period and class will begin with a quiz over the reading and video material.

QUIZZES:
To allow us to do more problems and case studies in class, you will be expected to do assigned readings and watch instructional videos on YouTube and come to class prepared for the topic at hand. To motivate you to do this, short quizzes over the videos are assigned before each class.

SUPPLEMENTAL INSTRUCTION
SI will be available in this class. All students are expected to attend at least four SI sessions before the first exam to be eligible for the SI participation points. If you score below a 75 on the first or second exam, you must attend 6 sessions before the following exam.

EXAMINATIONS:
In general, semester examinations will consist of problems and short answer questions. They will be written so that the average student can complete them in one hour.

All Students must find a non-programmable calculator for use on exams. It should have logarithmic and trigonometric functions but should not be programmable nor should it have infrared or digital communication capability. The Fundamentals of Engineering examination allows the use of the following: HP 33s and 35s,
any Casio fx-115 model, and TI-30X or 36X in all their variations. These are all acceptable and most cost less than $10.

**RULES FOR EXAMINATIONS**

1. Student ID cards will be required. They must be presented when exams are turned in.
2. No calculator covers will be permitted in the exam.
3. Back packs and purses will be stowed against the wall or on the floor in front of your desk.
4. No caps or hats may be worn or placed on the desk.
5. Students may not leave the exam room and return for any reason. Plan your diet/drinks accordingly.
6. No programmable calculators. You must have a calculator from the pre-approved list or a similar model.
7. Needed paper will be provided. All you need is a pencil, calculator, and straight edge/ruler.
8. Cell phones must be off and in backpack/purse. Anyone receiving a message or using their phone will be assumed to have cheated and will have their test collected. NO SMART WATCHES will be allowed. Possession of a smart watch in exam will be considered evidence of cheating and your exam will be collected.
9. Students arriving later than 15 minutes after exam start will be turned away unless they have been delayed by an evening class. The instructor must be notified ahead of time if a late arrival is expected.

**GRADING POLICY:**

*Curves:*  
There will be no curve applied to grades. Corrections may be applied to exams if I determine some problems were poorly conceived or worded. You should be able to do everything I ask so there will be no curve.

**Course Grades:**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>Homework</td>
</tr>
<tr>
<td>25%</td>
<td>Semester Exams*</td>
</tr>
<tr>
<td>25%</td>
<td>Final Exam</td>
</tr>
<tr>
<td>15%</td>
<td>Quizzes*</td>
</tr>
<tr>
<td>05%</td>
<td>Exam 0</td>
</tr>
<tr>
<td>05%</td>
<td>SI Participation</td>
</tr>
</tbody>
</table>

*The lowest two quizzes and one semester exam will be dropped.*

**NOTE:** All examinations grades are final and will not be changed 24-hrs after graded exam has been delivered to the class in general. It is your responsibility to check your exam for grading mistakes.

**Grading Scale:**
The grading scale will be 90-100=A, 80-89=B, 70-79=C, 65-69=D, <65=F. If your final course average is on the border between two grades, I reserve the right to give you the higher grade based on any or all of three factors:

A. Fraction of home-works completed and homework average  
B. Evidence of improving mastery shown by improving grades over the semester  
C. Performance on final exam.

A grade of incomplete ("I") will be given only in situations where a student is unable to finish the semester due to circumstances beyond his/her control. It will not be given if you fail to plan.
DROP POLICY:
Students can withdraw from a course through the Office of the Registrar on or prior to:

- September 13th, 2017 Wednesday: Last day to drop a class before it appears on the transcript and counts toward the “6-drop” limit. Last day to drop without it appearing on the transcript.

- November 15th, 2017 Wednesday: Drop/Withdrawal Deadline; last day for students to drop the course and receive a “DR” grade. After this date, students will be assigned a letter grade for the course that will count on the GPA.

EMAIL ETIQUETTE:
In the past, I have extended an amount of patience for email messages received. I then realized that I have done students a disservice in tolerating most emails because as a member of the faculty of the Department of Mechanical Engineering, it is necessary to provide a genuine effort in developing your professional skills. Consequently, I am instituting a (somewhat) formal email etiquette.

Most of your professional careers, you will be communicating via email. It is important that you are attentive in your writing, if you do not believe me see the article by Harvard Business Review.

Therefore, when you send me an email, please make the attempt to abide by the following (otherwise you might be subject to not receive a response):

Use appropriate **subject heading**: Course Number. Section Number – Brief Subject. i.e. “MECE2340.02 – Video Quiz on Composites.”

Start your body of email off with proper **greeting**, such as “Hello Ms. Ley,” or something similar.

Follow your greeting with at least one line of **whitespace** (that is, blank space).

Compose your email in paragraph form. Make sure you adhere to proper sentence structure, and proofread for typos and spelling mistakes.

Please make sure you know the difference between **they’re**, **their**, and **there**. Similarly, make sure you know when to use **it’s** versus **its**, and **your** versus **you’re**. (There are people who write entire books to convey the wrath and fury they feel when they see examples of such abominations of punctuation and spelling.)

Capitalize the first letter in each sentence.

Emoticons are acceptable. 😊 or 🙏 convey emotions necessary in email communications. Although, note that I would hold off until you feel the relationship between student – teacher has been established.

Plusses: Gratitude in an email never goes unnoticed, stating “I really appreciate your time in this matter,” or some other version of this statement is appreciated by all readers, not just myself.

If you choose to type in any other language you must abide by the email etiquette as well. Be aware that writing in any other language does not excuse you from the use of proper grammar. Consider that you run the risk of me not being able to translate your language of choice. Subsequently, it would be to your best advantage to write in **English**, since it is the primary language for the course.

Finally, use a proper closing (not too formal – save “Sincerely” or “Yours Truly” for first time emailing), finish with at least your First Name, but include the following in a signature item: First Name, Last Name, ID Number, Email or other form of contact information. See below:

Thanks,
John

________________________
John Doe
B.S. Candidate in Mechanical Engineering (expected 2017)
ID Number: 12345678910
University of Texas – Rio Grande Valley
Edinburg Campus
Jon.doe02@utrgv.edu
KEYS TO SUCCESS IN THIS CLASS:

1. Do the readings & homework assignments before class.
   a. Read before trying the homework problems to get an overview.
   b. Just trying to answer the questions without reading first will not prepare you for the class.

2. Use the Lectures
   a. Be on time (or you miss the quizzes).
   b. Be alert, ask questions, participate.

3. When I tell you something will be on a test...believe it.
   a. Review the objectives before each class...be sure you fulfill them during class.
   b. Do the homework.

4. Be sure you really understand what you’ve done.
   a. Work in groups but do your own work.
   b. Learn from Exams
   c. Clarify anything you miss immediately.

5. Utilize the Professor’s Expertise.
   a. Office hours are free consulting (worth $$).

6. Organize
   a. Keep a binder.
   b. Take notes and organize/review them.
   c. Keep track of your grades.

OTHER OBSERVATIONS:

Research indicates that students who WRITE notes during a class learn and retain significantly more than those who type them on a tablet/computer or who take no notes. Do not transcribe. You need to convert what I say and do into your own words.

I will be penalizing you for improper significant digits and for wrong units. Learn how to do both the first week and always do them correctly. On the final I take off at least two points for wrong units or too many significant digits.

SCHOLASTIC INTEGRITY:

Originality of Submitted Work:
If it is determined that submitted work is not original (either a copy of a solutions manual or another student’s work) the plagiarism will be reported to the Dean of Students for administrative action. Minimum penalty for such activity is loss of credit for work but may include expulsion from the course. The university has a two strikes policy. Cheating twice will result in suspension from UTRGV.

UTRGV Policy:
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents
Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

MAKE-UP AND LATE WORK:
Assignments are due when specified in the MELearn system LATE WORK WILL NOT BE ACCEPTED unless prior (24 hour) arrangements have been made. Provision may be made for genuine emergencies or business trips at the professor's discretion. However, you must contact the instructor well in advance of any business required absences or special arrangements cannot be made. Because only two out of three exams will be used in the grade calculation, there will be no make-up exams given for the semester exams. This no-late-work policy is mandated by departmental standards which do not allow late work.

COURSE DROPS:
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

STUDENTS WITH DISABILITIES:
Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

SEXUAL HARASSMENT, DISCRIMINATION AND VIOLENCE:
In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

COURSE EVALUATION:
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:

<table>
<thead>
<tr>
<th>Course</th>
<th>Available Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2017 Module 1</td>
<td>Oct. 5 – Oct. 11</td>
</tr>
<tr>
<td>Fall 2017 Module 2</td>
<td>Nov. 29 – Dec. 5</td>
</tr>
<tr>
<td>Fall 2017 (full semester)</td>
<td>Nov. 15 – Dec. 6</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>1</td>
<td>8/29</td>
</tr>
<tr>
<td></td>
<td>8/31</td>
</tr>
<tr>
<td>2</td>
<td>9/5</td>
</tr>
<tr>
<td></td>
<td>9/7</td>
</tr>
<tr>
<td></td>
<td>9/8</td>
</tr>
<tr>
<td>3</td>
<td>9/12</td>
</tr>
<tr>
<td></td>
<td>9/14</td>
</tr>
<tr>
<td>4</td>
<td>9/19</td>
</tr>
<tr>
<td></td>
<td>9/21</td>
</tr>
<tr>
<td>5</td>
<td>9/26</td>
</tr>
<tr>
<td></td>
<td>9/27</td>
</tr>
<tr>
<td></td>
<td>9/28</td>
</tr>
<tr>
<td>6</td>
<td>10/3</td>
</tr>
<tr>
<td></td>
<td>10/5</td>
</tr>
<tr>
<td>7</td>
<td>10/10</td>
</tr>
<tr>
<td></td>
<td>10/12</td>
</tr>
<tr>
<td></td>
<td>10/19</td>
</tr>
<tr>
<td>9</td>
<td>10/24</td>
</tr>
<tr>
<td></td>
<td>10/26</td>
</tr>
<tr>
<td></td>
<td>10/31</td>
</tr>
<tr>
<td></td>
<td>11/2</td>
</tr>
<tr>
<td>11</td>
<td>11/7</td>
</tr>
<tr>
<td></td>
<td>11/9</td>
</tr>
<tr>
<td>12</td>
<td>11/14</td>
</tr>
<tr>
<td></td>
<td>11/16</td>
</tr>
<tr>
<td>13</td>
<td>11/21</td>
</tr>
<tr>
<td></td>
<td>11/23</td>
</tr>
<tr>
<td>14</td>
<td>11/28</td>
</tr>
<tr>
<td></td>
<td>11/30</td>
</tr>
<tr>
<td></td>
<td>11/30</td>
</tr>
<tr>
<td>15</td>
<td>12/5</td>
</tr>
<tr>
<td></td>
<td>12/7</td>
</tr>
<tr>
<td>16</td>
<td>12/12</td>
</tr>
<tr>
<td></td>
<td>12/14</td>
</tr>
<tr>
<td></td>
<td>12/12</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENT OF RECEIPT OF SYLLABUS

By signing below, I hereby affirm that I have received a copy of the syllabus for 2340 Engineering Materials and have been informed by the Instructor that it is my responsibility to carefully read and understand this document and abide by all its content. I also agree to prepare and submit to the Instructor, at the end of the semester, a folder that contains all my homework assignments, quizzes, exams, projects, reports and/or literature review (if applicable).

__________________________________________
Student ID Number

__________________________________________
Printed Name

__________________________________________
Signature

__________________________________________
Date