Instructor
Karim Heinz Muci, Ph.D.
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E-mail: Karim.Muci@sdsmt.edu

Office Hours
Monday and Wednesday, 11:00 am – 12:00 noon; Tuesday and Thursday, 3:30 pm – 5:00 pm
Other times may be possible making and appointment at the end of one of our lecture hours.

Lecture Hours
Tuesday and Thursday, 1:00 pm – 2:15 pm

Classroom
Classroom Bldg., CB-205W

Web Site
http://speedy.sdsmt.edu/~kmuci/
In the “Course Materials” section of this web site the instructor will be posting during the semester important information. The students must check this web site on a regular basis.

Credits
3

Important Note
This course can be used to meet the Mechanical Systems requirement of the M.S. Program in Mechanical Engineering.

Prerequisites
• EM-321 Mechanics of Materials
• MATH-225 Calculus III
• MATH-321 Differential Equations

Textbook
Useful References


Expectations for Incoming Students

• Students are expected to enter this course with a good working knowledge of:
  ✓ Basic Solid Mechanics.
  ✓ Calculus.
  ✓ Ordinary Differential Equations.
• Basic computer skills, such as the ability to work in the MS Windows environment, are a prerequisite.
• The students should be able to comfortably work with MS Excel, MS Word and MS Power Point.
• The students should be able to use the software Mathcad (or another program with similar capabilities) or they should be able to program in their favorite programming language.

Student Effort

During each week, the student is expected to spend approximately ten hours outside of the classroom in preparation for class, studying the textbook and lecture notes, and solving homework assignments.

Course Description (According to the Graduate Catalog)

Study of advanced concepts in strength of materials. Topics will be selected from the following: theories of stress and strain, failure criteria, energy methods, torsion, nonsymmetrical beams on elastic foundation, plates, shells, stress concentrations, contact stresses, finite element methods, and plastic behavior of solids.

Course Objectives

After taking this course the student should be able to:

• Apply the theories of stress and strain during the solution of strength of materials problems.
• Understand the difference between plane stress and plane strain.
• Use the Airy stress function method to solve two-dimensional problems in elasticity.
• Use failure theories to determine if a component will fail or not according to a particular criteria.
• Obtain the analytical solution for problems involving axisymmetrically loaded members.
• Obtain the surface components of the stress tensor from strain gage measurements.

**Topics**
The topics that will be covered in the course will be selected from the following:
• Theories of stress and strain.
• Two-dimensional problems in elasticity.
• Failure criteria.
• Axisymmetrically loaded members.
• Experimental stress analysis – strain gages.

**Computer Usage**
• All students must have and regularly read an e-mail account. During the semester, the instructor may send important information to the students via e-mail.
• For some of the assignments, the students may benefit from using software that has capabilities similar to the ones found in Mathcad, Mathematica, Maple, or Matlab.

**Grading**
Exam 1 20 %
Exam 2 30 % (comprehensive)
Exam 3 (Final Exam) 30 % (comprehensive)
Homework 20 % (each may have a different weight based on difficulty)

**Grading Scale**

<table>
<thead>
<tr>
<th>Grade</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (%)</td>
<td>90-100</td>
<td>80-89</td>
<td>70-79</td>
<td>60-69</td>
<td>&lt; 60</td>
</tr>
</tbody>
</table>

**Exam Schedule**

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Time</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thursday, October 6, 2005</td>
<td>1:00 pm – 2:15 pm</td>
<td>CB-205W</td>
</tr>
<tr>
<td>2</td>
<td>Thursday, November 17, 2005</td>
<td>1:00 pm – 2:15 pm</td>
<td>CB-205W</td>
</tr>
<tr>
<td>3</td>
<td>Friday, December 16, 2005</td>
<td>4:00 pm – 5:50 pm</td>
<td>CB-205W</td>
</tr>
</tbody>
</table>

**Academic Integrity**
Students are expected to perform to a high standard of honesty and integrity in this course. Failure to do so will result in a final grade of “F” in addition to all the sanctions applicable according to all the rules and regulations currently in force at SDSM&T.

*Note:* According to the graduate catalog, academic dishonesty shall be defined to include all forms of cheating, fraud, plagiarism, or knowingly furnishing false information.

**Attendance Policy**
• Class attendance is mandatory: Every student is expected to attend each lecture.
• You must notify the instructor via e-mail and ahead of time (when possible) if you will be absent from class.
• Missing three or more class sessions may result, at the instructor’s discretion, in a failing grade.
In general, only the following will be considered by the instructor as excused absences:

- Medical emergencies.
- Mandatory participation of the student in a school-sponsored event as described in the 
  graduate catalog. (Note: In this situation, the student must follow all the guidelines and 
  procedures specified in the graduate catalog).

Note: The instructor will consider all other circumstances on a case-by-case basis.

If for some reason a student misses one lecture, it is the student’s responsibility to find out 
which material was covered and which assignments were given.

Class Cancellation Policy

If a class is missed due to weather or instructor’s absence, anything planned for that class 
(homework due, exam, etc.) will occur during the next class session.

General Policies

- Homework assignments are due at the beginning of the lecture on the assigned due date.
- Late homework will not be accepted. Since the number of assignments is relatively few, it is 
  very important to submit all of them. Missed assignments may severely affect your grade.
- Unless specified otherwise by the instructor, all the homework assigned during one week will 
  be turned in on Thursday of the following week at the beginning of the class session.
- Homework submissions: (1) must not be done on spiral-edged paper; (2) must have all 
  problems clearly labeled, neatly presented, and presented in the order in which they were 
  assigned; and (3) must be stapled in the upper left corner (if more than one page).
- The instructor may choose only a portion of a homework assignment to grade, with the grade 
  for that portion counting for the entire homework grade. No advance notice will be given as to 
  which portion of a homework will be graded.
- Grading of all materials will be strongly influenced by legibility and quality of presentation. If I 
  cannot read it easily then it is wrong and the grade will be zero!
- All exams will be open book (textbook only) and closed notes.
- Calculators will typically be required for the exams.
- There will be no makeup exams unless a student missed an exam due to a medical emergency 
  or mandatory participation in a school-sponsored event. If you miss an exam due to other 
  reasons, your grade in that exam will be zero.
- In the solution of any homework/exam problem that has a numeric answer, you must include 
  the appropriate units in all the steps of the solution process and in the final answer. Failure to 
  do so will automatically result in no credit given for that problem.
- Unless specified otherwise, the reading assignments I give during a class period should be 
  completed before the following class period. In class I will not cover point-by-point the 
  material corresponding to a reading assignment.
- You must study in full detail all the solved examples presented in the textbook for each topic 
  that we are covering in class.
- In some cases, I will only highlight the solution process for an example problem that I present 
  in class. You must try to solve those problems on your own before the next class session.
- Requests for re-grades on homework or exams must be submitted in writing within one week 
  of the class in which I return the item on which you question the grade. In this event, the entire
homework or exam will be re-graded with possible adjustment in either direction.

- Items not claimed the first time I return them to the class must be picked up in my office within one week of the class in which I attempted to return it. Items not picked up after one week will be disposed of.

- While consulting fellow students outside of the classroom to understand the material is encouraged, each homework or exam must represent work done only by the student (or by the team members, if the activity was carried out in teams at the request of the instructor). If this rule has been violated, all parties involved will receive the sanctions described in the section “Academic Integrity” of this syllabus.

- Near the end of the term a record of grades to date may be distributed to the students. If that is the case, each student should verify all grades and calculations. Any discrepancies observed by the student must be called to my attention by the next class and must be supported by graded materials. The instructor may correct any errors at that time.

- Final exams will not be returned to the students. However, you can see your final exam if you stop by my office between the time I have the final exams graded and the end of the semester. After the end of the semester, all the final exams will be disposed of.

**General Policies for Assignments Carried Out in Teams at the Request of the Instructor**

- It is expected that all team members will be actively involved in the completion of the assignment.

- If a student does not fully participate in the completion of an assignment, his/her name must not appear on the cover page of that assignment and a written notification signed by the other team members must be given to the instructor. Under these circumstances, the student will receive a grade of zero in that particular assignment. If this rule is violated, all the team members may receive, at the instructor’s discretion, a grade of “F” for the course.

- In each assignment, the team will determine the % of participation of each one of its members.

- The name of each team member must be written on the cover page of the assignment and his/her % of participation must be clearly stated.

- The grade that each student will receive will be the grade given by the instructor and/or GTA times the % of participation of the student.

- In the case of a homework, the procedure to carry out the assignment will be as follows: (1) Each team member will do his/her best effort to solve on his/her own all the assigned problems, (2) the team members will meet and discuss the solution for each one of the problems, and (3) the team will document in a very professional manner the solution for each one of the problems.

- It is the responsibility of each team member to carefully read the final document that will be turned in to the instructor and make sure that he/she completely agrees with all its contents.

- Grading will be influenced by the number of team members.

**Students with Special Needs**

Students with special needs or requiring special accommodations should contact the instructor, Dr. Karim Heinz Muci, at 394-2430, and/or the campus ADA coordinator, Jolie McCoy, at 394-1924, at the **earliest** opportunity.