ME325 – MACHINE DESIGN *SYLLABUS*

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Required Text & Tools:

- Budynas & Nisbett. Shigley's Mechanical Engineering Design. 9th Edition preferred any addition acceptable. McGraw Hill. 2011. (Hardcopy Required)
- Pencil, Paper (Quad or Quint Pad Recommended), Engineering or Scientific Calculator

Prerequisites:

- MFE 201/L, C- or better in ME 215, and ME 319.

Course Description: Design and application of machine components such as brakes, clutches, gears, mechanisms, bearings, ways, sleeves, and bushings. Lubrication of machine elements such as gaskets, seals, "o" rings, and fasteners. Design techniques and the design of a simple machine.

Course Grading		**Grading Scale**					
Homework	20%			A	100 % - 93 %	A-	92 % - 90 %
Labs, PD & Quizzes	10%	B+	89 % - 87%	B	86 % - 83%	B-	82 % - 80%
Master Project	40%	C+	79 % - 77%	C	76 % - 73%	C-	72 % - 70%
Test #1	10%	D+	69 % - 66%	D	65 % - 61%	D-	60 % - 56%
Test #2	10%			F	55 % - 0%		
Test (Final) #3	10% (optional for those with a cumulative grade of 93%+ after HW 15)						

Work Standards:

Engineering is a precise discipline. One aspect of this class, in addition to the engineering principles studied, is to teach each student solid engineering problem-solving & presentation of analysis skills. This starts with clearly defining the problem and the information sought, identifying the engineering principles and equations applicable, and applying them properly in an orderly fashion. Analytical work should be neat, clear, concise, and easy to follow. Avoiding, identifying and eliminating errors are highly dependent on being able to clearly review the analysis presented, both in the classroom and in the workplace. Credit on homework, quizzes and tests will be highly dependant on how easy it is to follow the thoughts and judgments of the student. Work that is cluttered, overly sloppy, jumbled, or simply hard to follow will lose points, even if the final answer is correct. The following standards are expected and will result in maximum credit:

- Homework should be worked on Quad (4 squares/inch) or Quint (5 squares/inch) paper. Ampad's Engineering paper (22-141, 22-142, or equivalent) is one of the best for this.
- Homework, test, & design project data should be worked on only one side of the paper.
- Each assignment should clearly identify the student's name (first & last).
- Each separate sheet of homework, design project, or test should also clearly identify the class (ME325), the assignment & number (HW #1, HW #2, DP #1, Test #1, etc.), the date, and the problem number being worked.
- Each homework problem should be clearly identified with three primary sections, GIVEN, FIND, & SOLUTION, with each section title identified & underlined.
- GIVEN: List the data given in the problem statement. Usually this should be preceded or accompanied by a sketch with appropriate dimensioning and/or labeling that contains most, if not all of the given information.
- FIND: State what you are trying to find in this problem.
- SOLUTION: Solve the problem in a neat and logical manner. Each equation used should be first identified prior to substituting the appropriate values. Each step in solving the equation should be clearly shown in a linear fashion as you proceed down the page.

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Important Notes, Expectations & Comments:

- Exams will be open (hardcopy) book and closed notes. No electronic devices will be allowed during exams or quizzes except calculators.
- Quizzes will be frequent and unannounced, and may be open or closed book.
- No make-up exams or quizzes will be administered.
- No Late Homework or Design Projects will be accepted or scored.
- Collaboration on homework is recommended. Copying homework is considered cheating.
- Cheating is unacceptable at any time, and will result in immediate failure of the class.
- Attendance is required. Every class has deliverables which will result in loss of points for missing class. Also, students who do not attend class may be dropped from the class.
- Cell Phones, pagers & laptops may not be used in class. Use will result in loss of class credit.
- Eating or drinking is not allowed in the classroom.
- October 1st is the last day to drop without a petition.
- Participation in class is desired, recommended, and rewarded.

Project:

- Details on the projects will be provided in class. Expectations, grading, & weighting for the Master Project are identified in the Master Project Word File on Bb.

Homework Grading Procedure:

Each student must grade their own Homework prior to submitting to instructor, as follows:

- Using a colored pen or marker that stands out from your homework, score each problem next to its identification, and circle the score of each.
- Score each problem as follows:
  - SETUP: Score 1 point if all the following is present in your solution:
    - Problem Number - Identified (1, 2, 3, etc) & circled
    - Given, Find, & Solution - Clearly marked & appropriate pertinent data recorded.
    - Sketch – Pertinent sketch of problem shown.
    - Neatness – Setup is legible & clear.
  - WORK: Score 2 points if all the following is present in your solution:
    - Equations – All pertinent equations needed and/or used are shown
    - Neatness – All work is legible and clear.
    - Complete - Problem is worked to completion & all answers are boxed.
  - ACCURACY: Score 0, 1, or 2 points, as follows.
    - If all answers requested match the answer provided, score 2 points.
    - In only some of the answers provided match the solution, score 1 point.
    - If no answer is provided, score 2 points.
- This means each problem score will range from 1 to 5 based on the above.
- Sum your scores to the top of the first page with the total points earned over the total possible (5 times the number of problems), and circle the total score conspicuously.
- If you failed to write your name at the top of the paper, or to staple your work together, score -3 next to the collective score.
- If you did something beyond the homework that you want me to see or score, write "See XYZ" or some such and I will take a look and evaluate.
- I will make any modifications to the grades as needed, and may score punitive point reductions if I feel the scoring is intentionally misleading.
- Any ungraded Homework will not be scored, and will show a zero in my gradebook.

If there are questions, see me.

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Class	Section	Number	Lecture	Location
ME325/L	1/1	73169/73172	8:00 am – 10:50 am MW	Bldg 9, Room 303

CLASS SCHEDULE

Week	Date	Lec	Day	Topics	Shigley's	HW Due	Project Development
1	29-Sep	1	M	Introduction	1-1 to 1-17	-	Lab 1
1	1-Oct	2	W	Shafting	7	1	Lab 2
2	6-Oct	3	M	Motors	See Charts	2	Lab 3
2	8-Oct	4	W	Gears - Spur & Helical - Design	13	3	Team Select
3	13-Oct	5	M	Gears - Spur & Helical - Strength	14	4	Draft Schedule
3	15-Oct	6	W	Gears - Bevel	13.15, 15.1-5	5	Report Template
4	20-Oct	7	M	Gears - Worm	13.17, 15.6-8	6	Prelim. Drawings
4	22-Oct	-	W	**Test #1 (Lectures 1-6)**	---	-	---
5	27-Oct	8	M	Lubrication & Sliding Bearings	12	7	Preliminary Calcs
5	29-Oct	9	W	Lubrication & Sliding Bearings	12	8	---
6	3-Nov	10	M	Bearings - Rolling Contact	11-1 to 11-8	9	Draft Report #1
6	5-Nov	11	W	Bearings - Tapered Rollers	11-9 to 11-12	10	---
7	10-Nov	12	M	Weldments	9	11	Draft Report #2
7	12-Nov	-	W	**Test #2 (Lectures 7-11)**	---	-	---
8	17-Nov	-	M	No Class (Coburn @ ASME IMECE)	---	---	---
8	19-Nov	-	W	No Class (Coburn @ ASME IMECE)	---	---	---
9	24-Nov	13	M	Clutches, Brakes, Couplings & FWs	16-1 to 16-3	12	Early Project +2%
9	26-Nov	-	W	Project Presentations	---	-	Project Due
10	1-Dec	14	M	Clutches, Brakes, Couplings & FWs	17-1 to 17-4	-	Late Project -10%
10	3-Dec	15-16	W	Flexible Elements	17-1 to 17-7	14	Late Project -20%
11	8-Dec	-	M	**Final Exam (Lect. 1-16) 7-9 AM**	---	N/A	-