EDMM 3540
METROLOGY
COURSE SYLLABUS

CATALOG DATA:
Precision measurement, its relationship to geometric tolerances, critical dimensions, and calibration. Statistical process control and quality assurance using manual and automated gauges, checking fixtures, non-destructive testing, and coordinate measuring systems. Use of vision, laser, and other non-contact measuring systems.

TEXTBOOKS:
Dotson, Connie: "Fundamentals of Dimensional Metrology", 5th edition, Thompson/Delmar Learning, ISBN 9781418020620 (Recommended)

COURSE COORDINATOR:
Dr. Pavel Ikonomov, Associate Professor: Engineering Design, Manufacturing, and Management Systems Pavel.Ikonomov@wmich.edu Office Rm. # E221 Floyd, phone (269) 276-3284.

PREREQUISITES BY TOPIC:
Engineering Statistics IEE 2610

CO- REQUISITES BY TOPIC:
Design for Production EDMM 3480

COURSE REQUIREMENTS:

- Attend all lectures, labs and demonstrations
- Participate in class discussions and all related activities
- Complete all assignments and meet all due dates
- Participate in group projects
- Use the library, Internet and, supplemental materials frequently

PERFORMANCE OBJECTIVES: Students who successfully complete this course will:

	Course Objectives	Performance Criteria
1	Understand the fundamentals of modem quality concepts. Be able to apply statistical techniques	D4 Develops appropriate design parameters (use, dimensions, economics, life cycle) considering identified constraints and criteria.
2	Understand the fundamentals of inspection methods and systems	K1 Establishes measurable product quality definitions for improvement.
3	Understand the principles and operation of precision measurement tools and equipment used in modern manufacturing.	
4	Be able to analyze simple parts for dimensional accuracy and functionality	
5	Be able to apply inspection gage and checking systems	

6	Understand the purpose of critical dimensions in manufacturing

EVALUATION:

Homework assignments	100 points	92 -100% =	A
Laboratory assignments	300	87-91%=	BA
Pop Quiz's	50	82- 86%=	B
Class project	200	77-81%=	CB
Mid-Term examination	150	72-76%=	C
Final examination	150	67-71%=	DC
Participation	50	62-66%=	D
		Below 61% =	E
	1000 points		

HOMEWORK ASSIGNMENTS:
You will receive several homework assignments dealing with quality, tool, gage, and fixture design. These assignments must be turned in as specified. A 10% late penalty may be assessed for late work. Classroom work groups will be assigned.

LABORATORY ASSIGNMENTS:
You are required to participate in all laboratory activities. You may not leave the lab early unless the instructor grants permission. The lab must be clean and all tools returned before leaving. Assignments must be turned in as specified. Lab partners are often required.

POP QUIZZES:
All Pop Quizzes will be periodically administered as required to augment the previous week's assignment.

CLASS PROJECTS:
You will have the opportunity to assemble into the group of your choice in order to participate in technology sharing. Explicit instructions will be given in class as appropriate.

COURSE DEFICIENCIES:
Students whose midterm/final examination score is 67% or less may receive a projected course grade of D or lower. You must pass the final examination in order to pass the course. If you are experiencing difficulties with the course material you should immediately arrange meetings with the instructor to implement corrective action. Do not delay such discussion.

ATTENDANCE:
Attendance is not considered a part of your grade. We strongly recommend that you attend all lectures, and associated activities, as continuity of subject matter may be lost. Exam and quiz make up is not automatic and is at the discretion of the instructor.

Due the arrangement of the labs work, missing one or more labs may lead to discharge from the course.

PARTICIPATION:

If you intend to receive on of the higher grades in the class, you should discuss ways to further participate in the technology transfer with the instructor early in the semester. **If you have NOT already done so, you are expected to schedule a personal interview with the instructor.**

Topics for week - Lecture/Activity	Reading
Introduction, course requirements/expectations, tour lab	
Historical evolution of metrology, tolerances.	Ch. 1
Language and systems of measurement.	Ch. 2
Measurement and tolerances. ***Establishing Datum*; Maximum Material Condition****	Ch. 3, Handouts
Development and use of gage blocks	Movie & Handouts
Limits and fits, standard requirements and selection	Handouts, Chapters 8
Force, shrinkage, and expansion fit; metric limits and fits	Handouts
Mid-Term examination	
Gaging, Jigs & fixtures, Class exercise (Professor F. Sitkins)	Movie & Handouts
Surface Measurement	Ch. 16, Handouts
Coordinate Measuring Machines. ***Three Dimensional Measurements****	Ch. 17, Handouts
Machines Vision Systems***. Vision Systems Measurement ****	Ch. 17, Handouts
Tolerance analysis in manufacture and tolerance charting	
Screw Thread Gaging and Measurement -standards	Handouts
Screw Thread Gaging and Measurement-inspection	Handouts
Final projects - Group Presentations and Final Examination review	
Final Examination	2:45-4:45 pm

ACADEMIC INTEGRITY:

You are responsible for making yourself aware of and understanding the University policies and procedures that pertain to Academic Honesty. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. (The academic policies addressing Student Rights and Responsibilities can be found in the Undergraduate Catalog at **http://catalog.wmich.edu/content.php?catoid=22&navoid=882**) If there is reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Conduct. You will be given the opportunity to review the charge(s) and if you believe you are not responsible, you will have the opportunity for a hearing. You should consult with your instructor if you are uncertain about an issue of academic honesty prior to the submission of an assignment or test.

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