

MT-253 Course Syllabus

COURSE SYLLABUS

COURSE TITLE: Basic Dimensional Metrology
2019

TERM & YEAR: Fall II

COURSE & SECTION NUMBER: MT 253 OL
PLACE: Online starting 10/21/2019

TIME &

NUMBER OF CREDIT HOURS: 3

OFFICE LOCATION/HOURS: online via Zoom or phone from 7:30 pm to 9:00 pm Mon. or Wed.

COURSE DESCRIPTION: Emphasis on methods and principles of measuring basic physical dimensions for inspection and quality assurance/control with an emphasis on manufacturing technology. Also covered are the basics of gaging and coordinate measuring systems.

PREREQUISITES: Geometric Dimensioning and Tolerancing, ETD113, Computer Aided 3D modeling, ETD 173.

REQUIRED TEXT: Dotson, Fundamentals of Dimensional Metrology, 6th Edition, Cengage Learning,

ISBN 13: 978-1-133-60089-3.

REFERENCES: 1. Walker, John R. Machining Fundamentals. GoodheartWillcox Co., Inc. any edition. 2. Griffith, GaryK. The Quality Technician's Handbook. 6th edition, Pearson 2013. ISBN 13: 978-0-13-262128-1

OTHER MATERIALS: Basic Measuring Tools such as Micrometer, Gage Blocks, Vernier Calipers, Outside and Inside Calipers, Steel Rulers, Angular Measurement Tools (will be available as part of the course)

LEARNING OUTCOMES: Upon completion of this course, the student should be able to:

1. Describe measurement equipment and techniques found in industry.

2. Explain basic concepts of measurement technology including calibration, statistical considerations, and tolerancing.
3. Use basic hand measurement tools to measure the dimensions of manufactured components.
4. Demonstrate knowledge related to the basics of more advanced measurement systems including basic comparative, pneumatic, optical, and coordinate measuring machine techniques.

COURSE REQUIREMENTS:

ATTENDANCE/PARTICIPATION: All students are expected to log in to their courses regularly throughout the week to receive instruction, materials, and updates from the instructor. It is your responsibility to check in and submit your assignments or complete your discussion board postings by the due dates. If you miss 3 classes or more you will be dropped from the course.

If you do not participate in the course, you will be counted absent. Simply logging in is not enough; you must submit/complete an assignment, post to a discussion board, or other similar assignment tasks to avoid being counted absent. Instructors are required to submit attendance the Monday following each week of class.

GRADING / EVALUATION: GRADING/ EVALUATION:

Course grading components will be weighted as follows:

Participation in Discussion Forums	55 Points (2 discussions)
Assigned Exercises (weekly)	840 Points (8 assignments)
Measurement Labs	240 points (5 labs)
Final (lab assignment) assignment)	100 points (1 final lab)
Total Points Possible	1275 Points

Grades will be determined based on the following percentages:

A	90% to 100%
---	-------------

B+	86% to 89%
B	80% to 85%
C+	76% to 79%
C	70% to 75%
D+	66% to 69%
D	60% to 65%
F	0 to 59%

Graded assignments will normally be returned within one week of submission.

ASSIGNMENT DUE DATES

All weekly assignments are due by 11:55 pm on Sunday Evening at the end of each week except for the last week when they are due by Saturday Evening by 11:55 pm. There will be a severe penalty for late assignments. Please plan ahead if you cannot participate in class in a timely manner or complete an assignment on time. If a documentable personal or professional emergency arises, please contact the instructor via phone or email to make alternative submission arrangements.

OTHER POLICIES:

ACADEMIC MISCONDUCT

The University prohibits all forms of academic misconduct. Academic misconduct refers to dishonesty in examinations (cheating), presenting the ideas or the writing of someone else as one's own (plagiarism) or knowingly furnishing false information to the University by forgery, alteration, or misuse of University documents, records, or identification. Academic dishonesty includes, but is not limited to, the following examples: permitting another student to plagiarize or cheat from one's own work, submitting an academic exercise (written work, printing, design, computer program) that has been prepared totally or in part by another, acquiring improper knowledge of the contents of an exam, using unauthorized material during an exam, submitting the same paper in two different courses without knowledge and consent of professors, or submitting a forged grade change slip or computer tampering. The faculty member has the authority to grant a failing grade in cases of academic misconduct as well as referring the case to Student Life.

PLAGIARISM

You are expected to submit your own work and to identify any portion of work that has been borrowed from others in any form. An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential a skill and will result in an F for that assignment. A deliberate act of

plagiarism, such as having someone else do your work, or submitting someone else's work as your own (e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), will at least result in an F for that assignment and could result in an F for the course.

E-DEVICE POLICY (on site venues)

Use of electronic devices including smart watches and cell phones is prohibited during exams or quizzes unless directly allowed by the instructor.

DIGITAL MEDIA DEVICES (on site venues)

Our learning environment, including classrooms and public lecture halls, should be free from disruptions from personal communication and media devices. In such settings, cell phones and all other such devices must be turned off. Camera cell phones must be turned off in locker rooms and other such private places. The use of a computer in the classroom is a privilege, not a right. The student must understand (and resist) the temptation to "surf the 'net" or engage in ANY activity not related to the classroom topic and discussion. Violations of the Trine University Information Technology Security Policy may result in disciplinary action by the University.

ADDITIONAL INFORMATION:

ACADEMIC RESOURCES:

There are several academic services that may be useful to you during the semester along with the library and assistance with digital resources that can found in the University Center LINK.

The links to information here include:

- *Writing Center:*
- *Math Help Sessions:*
- *Study Sessions:*
- *Parent and Family Support and Parent Newsletter:*
- *Accessibility and Accommodations:*

They are accessible on one page at the following link:

<https://www.trine.edu/academics/success/academic-support-services.aspx>

Course Mapping - Course: MT 253 Basic Dimensional Metrology

Course Learning Outcomes (obtained from the Syllabus of Record)

1. Describe measurement equipment and techniques found in industry.
2. Explain basics concepts of measurement technology including calibration, statistical considerations, and tolerancing.
3. Use basic hand measurement tools to measure the dimensions of manufactured components.
4. Demonstrate knowledge related to the basics of more advance measurement systems including basic comparative, pneumatic, optical, and coordinate measuring machine techniques.

Week	Learning Materials for the week	Activities for the week	Assessments for the week
Week 1 LOC1 LOC2	a. Metrology Book Chapters 1 – 3 (LOC1, LOC2)	a. Read Chapter 1 – 3 (LOC1, LOC2)	a. Answer learning questions for each chapter (LOC1, LOC2) b. Answer multiple choice questions for each chapter(LOC1, LOC2) c. Participate in Week 1 Discussion on cost of measurement errors to industry (LOC2)

<p>Week 2 LOC1 LOC2 LOC3</p>	<p>a. Metrology Book Chapters 4-6 (LOC1, LOC2) b. YouTube video on reading inch scale for Vernier caliper (LOC3) c. YouTube video on reading metric scale for Vernier caliper (LOC3) d. Measurement Lab Instructions(LOC3)</p>	<p>a. Read chapter 4-6 (LOC1, LOC2) b. Watch YouTube Videos (LOC3) c. Study measurement lab assignment instructions (LOC3)</p>	<p>a. Answer learning questions for chapters 4, 5 (LOC1, LOC2) b. Answer multiple choice questions for chapters 4,5 (LOC1 & LOC2) c. Create PowerPoint for Chapter 6 (LOC1 & LOC2) d. Perform measurement lab experiment (LOC3)</p>
<p>Week 3 LOC1 LOC2 LOC3</p>	<p>a. Metrology Book Chapters 7-8 (LOC1, LOC2) b. YouTube Video on how to read an inch micrometer (LOC3)</p>	<p>a. Read chapters 7-8 (LOC1, LOC2) b. Watch YouTube video (LOC3) c. Study measurement lab assignment instructions (LOC3)</p>	<p>a. Answer learning questions for chapters 7, 8 (LOC1, LOC2)</p>
	<p>c. Measurement Lab Instructions (LOC3)</p>		<p>b. Answer multiple choice questions for chapters 7, 8 (LOC1 & LOC2) c. Perform measurement lab experiment (LOC3)</p>
<p>Week 4 LOC1 LOC2 LOC3</p>	<p>a. Metrology Book Chapters 9-10 (LOC1, LOC2) b. Measurement Lab Instructions (LOC3)</p>	<p>a. Read chapters 9-10 (LOC1 & LOC2) b. Study measurement lab assignment instructions (LOC3)</p>	<p>a. Answer learning questions for chapters 9, 10 (LOC1, LOC2) b. Answer multiple choice questions for chapters 9, 10 (LOC1 & LOC2) c. Perform measurement lab experiment (LOC3)</p>

<p>Week 5 LOC1 LOC2 LOC3</p>	<p>a. Metrology Book Chapters 11-12 (LOC1, LOC2) b. Measurement Lab Instructions (LOC3)</p>	<p>a. Read chapters 11-12 (LOC1, LOC2) b. Study measurement lab assignment instructions (LOC3)</p>	<p>a. Answer learning questions for chapter 12 (LOC1, LOC2) b. Answer multiple choice questions for chapters 12 (LOC1 & LOC2) c. Create PowerPoint for Chapter 11 (LOC1 & LOC2) d. Perform measurement lab experiment (LOC3)</p>
<p>Week 6 LOC1 LOC2 LOC3 LOC4</p>	<p>a. Metrology Book Chapters 13-15 (LOC1, LOC2, LOC4) b. Measurement Lab Instructions (LOC3)</p>	<p>a. Read chapters 13-15 (LOC1 & LOC2, LOC4) b. Study measurement lab assignment instructions (LOC3)</p>	<p>a. Answer learning questions for chapters 14, 15 (LOC1, LOC2, LOC4) b. Answer multiple choice questions for chapters 14,15 (LOC1 & LOC2, LOC4) c. Create PowerPoint for Chapter 13 (LOC1 & LOC2, LOC4) d. Perform measurement lab experiment (LOC3)</p>

<p>Week 7 LOC1 LOC2 LOC4</p>	<p>a. Metrology Book Chapters 16-17 (LOC1, LOC2, LOC4)</p>	<p>a. Read chapters 16-17 (LOC1 & LOC2, LOC4)</p>	<p>a. Answer learning questions for chapters 16, 17 (LOC1, LOC2, LOC4) b. Answer multiple choice questions for chapters 14,15 (LOC1, LOC2, LOC4) c. Participate in Week 7 Discussion on use of optics in metrology (LOC1,LOC2, LOC4)</p>
<p>Week 8 LOC1 LOC2 LOC3 LOC4</p>	<p>a. Metrology Book Chapter 18 (LOC1, LOC2, LOC4) b. Final - Measurement Lab Instructions (LOC3)</p>	<p>a. Read chapter 18 (LOC1 & LOC2, LOC4) b. Study Final-measurement lab assignment instructions (LOC3)</p>	<p>a. Answer learning questions for chapter 18 (LOC1, LOC2, LOC4) b. Create PowerPoint for Chapter 18 (LOC1 & LOC2, LOC4) c. Perform Final-measurement lab experiment (LOC3)</p>