

CRN# 22502
IT 50700 Measurement And Evaluation in Industry and Technology
Spring 2016

Purdue University Master of Technology Program
Industry Technology/Manufacturing, IT/Advanced Computer Applications Tracks

Purdue University Fort Wayne Campus

Course Description

IT 50700 Measurement and Evaluation in Industry and Technology, 3 cr. hr, class 3 (Course Catalog Description)

An introduction to measurement strategies in industrial, technical, and human resource development. The evaluation of measurement outcomes will be the primary focus of the course.

Prerequisite: Basic understanding of Probability and Statistics and Graduate (or Senior) standing. IT 507 or consent of instructor.

Required Text Book:

1. Douglas C. Montgomery and George C. Runger, *Applied Statistics and Probability for Engineers*, 6th Ed, by publisher: John Wiley & Sons, ISBN 978-1-11853971-2, www.wiley.com/college/montgomery.
2. Cooper, D.R., & Schindler, P.S., *Business Research Methods* (11th edition), 2011, McGraw-Hill/Irwin

Required Software:

- Microsoft Office 2013, Excel and Microsoft Visio
- Minitab 16, R Language, or SPSS

Instructor

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Office Hours:

- Monday 1:00-3:00 PM, 6:00-7:00 PM
- Tuesday 11:00-12:00 Noon, 5:00-6:00 PM
- Wednesday 1:00-3:00 PM
- Thursday 11:00-12:00 Noon
- Other weekday hours – by appointment

Class Meeting Room/Time

- Room ET 346, Tuesday 6:00 PM – 8:45 PM
- Course Web site: <http://www.etc.ipfw.edu/~lin>

Important Dates: <http://www.ipfw.edu/academics/calendar/>

- Monday, Jan. 18, Martin Luther King Jr. B.D. – No Class
- March 7 – March 13, Spring Break – Spring Break
- Final Exam – May 6, 10:30 a.m to 12:30 p.m., <http://www.ipfw.edu/academics/finals/>

Objectives

This course is structured to fulfill the following objectives:

- Learn the application of scientific thinking to study the real world industry problems.
- Describe the various data types and scales for determining and measuring them.
- Develop skills in applying statistical techniques such as: Hypothesis Testing, Interval estimation methods.
- Determine proper sampling techniques for a given research scenario.
- Utilize and interpret various charts, graphs, and tables displaying statistical information.
- Apply basic descriptive statistics to give a research design scenario.
- Use software to compute the basic statistical analyses.
- Understand how various statistical methods help when applied in practice through articles reviews.
- Understand the flaws and fallacies in statistical thinking.
- Learn hands-on how to apply some of the techniques and their implementation issues through homework and article review.

Class Activities, Expectations, Grading

- The class format will be 3 hour lecture/class discussion each week, 16 weeks total.
- Active student participations in discussing questions, presenting/discussing case studies, articles and papers from the recent literature, and a team-based final project and presentation are expected.
- Student assignments include case studies, reading technical papers and/or articles and writing short summary for each paper.
- Case studies and presentations: Each student will take responsibility for “leading” the discussion of a minimum of three case studies
- Term project: students will complete a term project working in groups of 2-3 students, prepare project proposal, progress reports; present projects in class and complete a written project report. Guidelines for the project will be provided in the class.

Grading:

- Homework
 - Individual end-of-chapter questions (short answer/essay/numerical problems), reading assignment and summary reports [due one week from the assigned date, electronic

submission; require statistical software package such as Excel, Minitab, or Matlab, etc – 25%

- Article presentations – 10%
- Research Paper – 15%
- Mid-term exam (in class) project – 15%
- Flaws and Fallacies Project – 10%
- Final exam (take home) – 25%

Grading Scale: A (90-100%), B (80 -89%), C (70-79%), D (60-69%), F (0-59%)

*No late assignment, reports, etc, will be accepted, unless a previous arrangement is made.

Disabilities Statement:

If you have a disability and need assistance, special arrangements can be made to accommodate most needs. Contact the Director of Services for Students with Disabilities (Walb, room 113, telephone number 481-6658), as soon as possible to work out the details. Once the Director has provided you with a letter attesting to your needs for modification, bring the letter to me. For more information, please visit the web site for SSD at <http://www.ipfw.edu/ssd/>

IPFW Academic Regulation:

9. Academic Honesty: It should be noted that the policy of the University that any student found to have engaged in any activity constituting academic dishonesty will receive an "F" for the course in which the activity occurred or a dismissal from the University. The following web page explains the policy in detail: <http://bulletin.ipfw.edu/content.php?catoid=38&navoid=1019#Disciplinary>

Code of Student Rights, Responsibilities, and Conduct"

- **Part II. Student Conduct Subject to Disciplinary Action,**
<http://bulletin.ipfw.edu/content.php?catoid=38&navoid=1019#Disciplinary>
 - **A. Academic misconduct**

Tentative Topics of Discussion

- Introduction and Course Overview
- Introduction to Measurement and Evaluation in Industry and Technology
- An Introduction to Research and Design in Industry and Technology (Book 2)
 - Research Process – An Overview
 - Research Design – An Overview
 - The Sources and Data Collection
 - Analysis and Presentation of Data
- Statistical Methods and Probability
 - Basic Statistical Concepts and Axioms of Probability
 - Descriptive Statistics and Descriptive Models (Ch. 6 Descriptive Statistics) of Book 1
 - Inferential Statistics (Ch. 7 Point Estimation of Parameters and Sampling Distribution)

- Hypothesis Testing (simple sample, tests on mean)
- Tests on Two Samples (paired tests, variance comparison)
- Simple Linear Regression, Test of Significance, Coefficient of Determination
- Confidence and Prediction Intervals, Correlation
- Multiple Regression

- Applications – Industry and Technologies
 - Educational System Assessment & Evaluation: ABET
 - Technology and Engineering Areas: Retrospective study, Observational study, Designed experiments
 - Manufacturing Industry: Production process, statistical quality control, performance evaluation, quality control and management systems

- Enterprise/Business Areas:
 - Reporting study, Descriptive study, Explanatory study, and Predictive study
 - Decision support and business intelligence, Business performance management, Knowledge management, Data management system