

**CRN# 11860**  
**TECH 646 Analysis of Research in Industry & Technology**  
**Fall 2018**

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

**Purdue University Fort Wayne**

**Course Description**

**TECH 646 Analysis of Research in Industry & Technology**, 3 cr. hr, class 3 (Course Catalog Description)  
Analysis of research and evaluation of research reports. Emphasis on understanding the application of fundamental statistical methods in design and interpretation of research findings in industrial, technical, and human resource development environments.

**Prerequisite:** IT 507 or consent of instructor.

**Required Text Book:**

- (1) Cooper, D.R., & Schindler, P.S., *Business Research Methods* (12<sup>th</sup> edition), 2014, McGraw-Hill/Irwin
- (2) Montgomery, D. C., Runger G. C., *Applied Statistics and Probability for Engineers*, 6<sup>th</sup> Edition, 2011, Wiley, [www.wiley.com/college/montgomery](http://www.wiley.com/college/montgomery)

**Required Software:**

- Microsoft Office and Microsoft Visio
- Minitab 17

**Instructor**

Paul I. Lin, Professor of Electrical and Computer Engineering Technology

**School of Polytechnic**

**College of Engineering, Technology, and Computer Science**

**Purdue University Fort Wayne**

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Office Hours:

- Monday 3:30-5:30 PM
- Tuesday 1:00-3:00 PM, 4:30-5:30 PM
- Thursday 1:00-3:00 PM, 4:30-5:30 PM
- Other weekday hours – by appointment

**Class Meeting Room/Time**

- Thursday 6:00-8:45 PM, in Room ET 215
- Course Web site: <http://www.etc.pfw.edu/~lin>

**OBJECTIVES**

This is a research focused course and builds on the knowledge gained from the earlier course on measurements and evaluation in industry and technology. The course focuses on practical applications of

research methodologies in industrial environments. It is designed to explain the typical activities involved in research by detailing the steps and sequence involved in most research projects. Students develop a systematic methodology for conducting a real world research project in collaboration with participating industry. These projects are designed with a focus on industrial, managerial and/or technical decisions, and they must exemplify sound reasoning, problem identification, formulation, and testing. The course places a strong emphasis on understanding the application of statistical methods and research design. Students are required to analyze on the real world industry data and prepare a professional report including the analysis details and clear recommendations.

Successful students will be able to:

- Apply the scientific research approach to practitioner problems in business, industry and government.
- Select the appropriate data type and the scales for measuring the industry data.
- Enhance skills in performing analysis and interpreting the results of statistical methods such as: Hypothesis Testing, Regression and Correlation Analyses.
- Understand the application of multivariate analysis techniques such as cluster analysis and multiple regression models.
- Demonstrate systematic thought processes used in scientific thinking and knowledge development.
- Identify, describe and implement the key steps in the research process, including proposal generation, research design, methodology, data collection, analysis of findings, and written and oral presentation of results.
- Generate a draft proposal for an applied research project.
- Employ rigorous standards and conventions in formatting research documentation.

#### **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.

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

- Sept. 3 (Monday) - Labor Day Recess
- Oct. 15-17 (Monday and Tuesday)– Fall Recess
- Nov. 21-25 (Wednesday - Sunday) - Thanksgiving Recess
- Dec. 11, Tuesday (5:45-7:45PM), Final Project Report & Presentation, <http://www.pfw.edu/academics/finals/>

**Grading:**

- 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, Matlab, etc] – 30%
- Case studies and presentations – 25%
- Mid-term project – 15%
- Team-based term project (proposal, progress report and final report; and presentation) – 30%

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 Union, 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.pfw.edu/ssd/>

**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.pfw.edu/content.php?catoid=18&navoid=464#acad\\_hone](http://bulletin.pfw.edu/content.php?catoid=18&navoid=464#acad_hone) and

[http://bulletin.pfw.edu/content.php?catoid=18&navoid=464#Part\\_II](http://bulletin.pfw.edu/content.php?catoid=18&navoid=464#Part_II)

**Tentative Schedule**

Week	Book	Topics	Assignments
1 8/20 to 8/24	Ch 1	Intro to the course, syllabus review, expectations & schedule  Ch 1. Research in Business and Industry: An introduction * Information and Competitive Advantage: Goals, Decision Support, Business Intelligence, Strategy, Tactics * Hierarchy of Information-Based Decision Makers: Top, Middle, and Base Tiers * The Research Process: An Overview *The Types of Research Studies: Reporting, Descriptive, Explanatory, Predictive	TBD

2 8/27 to 8/31	Ch 2	2.Ethics in Business Research : Ethics in business research, human subject research – Guidelines and federal regulations	TBD
3 9/3 to 9/7	Ch 3	3.Thinking Like a Researcher : Language of research, Research and the Scientific Methods	TBD
4 9/10 to 9/14	Ch 4	4.The research process: An Overview	TBD
5 9/17 to 9/21	Ch 5	5. Clarifying Research Questions through Secondary Data and Exploration : A search strategy for exploration, mining internal sources, the question hierarchy: ambiguous questions, actionable questions	TBD
6 9/24 – 9/28	Ch 6, 7	6. Research Design 7. Qualitative Research Project Proposal	TBD
7 10/1 to 10/5	Ch 8, 9	8.Observation Study 9. Experiments Fall Break Oct. 12 & 13	TBD
8 10/8 to 10/12	Ch 10	10. Surveys	TBD
9 10/15 to 10/19	Ch 11, 12	11.Measurement 12.Measurement Scale	TBD
10 10/22 to 10/26	Ch 13	13.Questionnaires and Instruments	
11 10/29 to 11/2	Ch 13	20. Presenting Insights and Findings: Written and Oral Reports	TBD
12 11/5 to 11/9	Ch 15, 16	15.Data Preparation and Description 16.Exploring, Displaying, and Examining Data	TBD
13 11/12 to 11/16	Ch 17	17. Hypothesis Testing	TBD
14 11/19 to 11/23		Nov. 21-25 Thanksgiving Recess	TBD
15 11/26 to 11/30	Ch 18	18. Measures of Association  Project review/discussion	TBD
16 12/3 to 12/7		Draft copy of your final project report due	TBD
17 12/11		Final Project – Final project report due; Oral Presentation (Dec. 11; Thursday 5:45 – 7:45 PM)	