CRN# 13132
TECH 646 Analysis of Research in Industry & Technology

Fall 2010

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

Indiana University-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:

Instructor
Paul I. Lin, Professor of Electrical and Computer Engineering Technology
Department of Computer and Electrical Engineering Technology & Information Systems and Technology
Indiana University-Purdue University Fort Wayne
2101 Coliseum Blvd E, Fort Wayne, IN 46805
Office: ET 205C Phone: 260-481-6339 Email: lin@ipfw.edu or pilin@purdue.edu
Office Hours:
• Tuesday 3:30 - 5:30 PM Tuesday 5:00 - 8:00 PM
• Thursday 3:30 – 5:30 PM Other weekday hours – by appointment

Lecture:
• Room ET 320, Monday 6:00-8:45PM
• Course Web site: http://www.etcs.ipfw.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 3-4 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:

- Individual end-of-chapter questions (short answer/essay/numerical problems), reading assignment and summary reports [due one week from the assigned date; electronic submission; may require statistical software package such as Excel, Minitab, Matlab, etc] – 30%
- Case studies and presentations – 15%
- Mid-term exam (open books and notes) in Class – 15%
- Team-based term project (proposal, progress report and final report; and presentation) – 30%
- Class participation (attendance, class discussion, etc) – 10%

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/

**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=18&navoid=464#acad_hone and http://bulletin.ipfw.edu/content.php?catoid=18&navoid=464#Part_II

### Tentative Schedule

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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Chapter</th>
<th>Topics</th>
<th>Assignments</th>
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| 1    | 8/23  | Ch 1    | Intro to the course, syllabus review, expectations & schedule  
Research in Business and Industry: An introduction | • Review Ch 1  
• Read Appendix A: Business Research Requests and Proposal |
| 2    | 8/30  | Ch 2, 3 | Ethics in Business Research: Ethics in business research, human subject research – Guidelines and federal regulations  
Thinking Like a Researcher: Language of research, Research and the Scientific Methods | TBD |
| 3    | 9/6   |         | Labor Day Holiday | TBD |
| 4    | 9/13  | Ch 4    | The research process, stages, research process issues | TBD |
| 5    | 9/20  | Ch 5    | Clarifying Research Questions: A search strategy for exploration, mining internal sources, the question hierarchy: ambiguous questions, actionable questions | TBD |
| 6    | 9/27  | Ch 6, 7 | Research Design  
Qualitative Research Project Proposal | TBD |
| 7    | 10/4  | Ch 8, 9, 10 | Observation Study  
Surveys  
Experiments | TBD |
| 8    | 10/11 |         | Fall Break Oct. 11, 12 | TBD |
| 9    | 10/18 | Ch 11, 12 | Measurement  
Measurement Scale | TBD |
| 10   | 10/25 | Ch 13, 20 | Questionnaires and Instruments  
Presenting Insights and Findings: Written and Oral Reports | TBD |
| 11   | 11/1  | Ch 15, 16 | Data Preparation and Description  
Exploring, Displaying, and Examining Data | TBD |
| 12   | 11/8  | Ch 17, 18 | Hypothesis Testing  
Measures of Association | TBD |
<p>| 13   | 11/15 | Ch 19   | Multivariate Analysis | TBD |
| 14   | 11/22 |         | Project review/discussion | TBD |
| 15   | 11/29 |         | Project review/discussion | TBD |</p>
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<tr>
<td>16</td>
<td>12/6</td>
<td>Oral presentation and final project report due</td>
<td>TBD</td>
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<tr>
<td>17</td>
<td>12/13</td>
<td>Final Project – Presentation (6:00 – 8:00 PM)</td>
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