

Course syllabus

Fall Semester 2009

Department of Industrial Technology

University of Northern Iowa

Cedar Falls, IA 50614--0178

330:292 Research Methods in Industrial Technology

Instructor: Dr. P. Nageswara Rao

Office: ITC Rm 35

Telephone: 273 6429

Email: Posinasetti.Rao@uni.edu

Course web page: www.uni.edu/~rao/Course7.htm

CLASS SCHEDULE: Thursday eve 5.00 to 7.50 p.m. Room 6, ITC

OFFICE HOURS: W 8:00 a.m. - 12:00 p.m. or by appointment

Catalogue description: Principles of methods and evaluation of research in industrial technology. Individual exploration of possible thesis topics.

Objectives:

The course content has been structured to help the learner to achieve the following objectives:

1. Develop skills and knowledge in order to employ and refer to a variety of research tools such as computer searches, databases, abstracts, periodical indices, library indices, and other aids for doing research.
2. Become skilled in analyzing, evaluating, and digesting (summarizing) research writing in the areas of industrial technology and education.
3. Be able, to identify and describe the types of research.
4. Identify, describe and develop an acceptable written research proposal for a thesis, or dissertation.
5. Identify and define a meaningful problem that is germane to the field of industrial technology.
 - a. Search out and conduct a review of related literature on the desired problem.
 - b. Formulate research questions and/or hypotheses, based on the previous research or the literature reporting research, for the desired problem.
 - c. Define and state, in a succinct fashion, each component and/or section for a research proposal.
 - d. Identify and detail a plan for collecting and analyzing data for the selected research problem.
 - e. Identify and describe the appropriate procedures for investigating and carrying out the appropriate METHODOLOGY for the selected problem or set of variables.
6. Become skilled in using the scientific method as well as skilled in logical reasoning (both inductive and deductive), association, correlation, and cause and effect.
7. Become familiar with the style and format specified in the APA Publication Manual and the Graduate College Thesis and Dissertation Manual as well as be able to demonstrate that ability in written work.

Text books

1. American Psychological Association (2001). Publication Manual of the American Psychological Association (5th ed.), Washington, D.C.
2. Fraenkel, J. R. & Wallen, N.E. (2009). How to Design and Evaluate Research in Education. (7th ed.) New York: McGraw-Hill, ISBN-978-0-07-352596-9.

References:

1. Ary, D., Jacobs, L.C. & Razavieh, A. (2002). Introduction to research in education. (6th ed.) Belmont: Wadsworth/Thomson Learning.
2. Bazeley, P. (1999, Oct.) Continuing research by PhD graduates. Higher Education Quarterly, 53 (4). 333-352 LA 630. U55
3. Best, J. W. & Kahn, J. V. (1998). Research in education (8th ed.). Englewood Cliffs, NJ: Prentice-Hall.
4. Creswell, J.W. (2008) Educational research: planning, conducting & evaluating quantitative & qualitative research (3rd ed.). Upper Saddle River, NJ: Merrill/Prentice-Hall.
5. Custer, R.L. (1993). Reviewing the literature: Techniques for the researcher. Journal of Industrial Teacher Education, 30 (3). 98-104.
6. Edyburn, D.L. (1999). The electronic scholar: Enhancing research productivity with technology. Upper Saddle River, NJ: Prentice-Hall.
7. Gall, M. D. & Borg, W. R. (1999) Applying educational research: A practical guide (4h ed.) NY: Longman.
8. Gay, L. R. & Airasian. P. (2009). Educational research: Competencies for analysis and application (9th ed.). Upper Saddle River, NJ: Merrill.
9. Israel, E. N. & Wright, R. T., Eds.: (1987). Conducting technical research, Mission Hills, CA: Glencoe Publishing.
10. Kraemer, H. C. & Thiemann, S. (1987). How many subjects? Statistical power analysis in research. Newbury Park, CA: Sage Publications.
11. Locke, L.F., Spirduso, W.W., & Silverman, S.J. (2000). Proposals that work: a guide for planning dissertations and grant proposals (4th ed.) Thousand Oaks, CA: Sage Publications.
12. Plake, B.S. (Eds.) & Impara, J.C. (2001). The fourteenth mental measurements yearbook. Univ. of Neb. at Lincoln: Buros Institute of Mental Measurements. Silver Platter International via UNI Lib. Ref LB1131.M4
13. Punch, K.F. (2000). Developing effective research proposals. London: Sage.
14. Rudestam, K.E. & Newton, R.R. (2001). Surviving your dissertation: A comprehensive guide to content and process (3rd ed.). Newbury Park, CA: Sage.
15. Salkind, N.J. (2009). Exploring research (7th ed.). Upper Saddle River, NJ: Prentice-Hall
16. Smith, S.W., Brownell, M.T., Simpson, R.L., & Deshler, D.D. (1993). Successfully completing the dissertation. Remedial and Special Education, 14 (3), 53-60.
17. Wiersma, W. (1995). Research methods in education (5th ed.). Boston: Allyn & Bacon.

Topical Outline – Tentative

Date	Session	Topic	Reference	Submission
Aug 27	1	Introduction to research and scholarly investigation. Types of Research, Critical Analysis of Research Research proposal	Chapter 1 Chapter 25	
Sep 3	2	Research Problem & Purpose, Characteristics of Good Research Questions, The Importance of Studying Relationships, Hypothesis (Res. Questions) & Variables Ethical practices	Chapter 2 Chapter 3 Chapter 4	
Sep 10	3	The Value of a Literature Review, Doing a Manual Search, Doing a Computer Search, Writing the Literature Review Report Computer Search on topic - library resources	Chapter 5, Custer	1. a. Valuative analysis of a thesis/ dissertation
Sep 17	4	Proposal Elements - discussion		
Sep 24	5	Purpose, Need, Validity, Reliability Library Visit	Chapter 8, 9	1. b. Valuative research articles
Oct 1	6	Quantitative Research Methodologies Experimental Research	Chapter 13	1. c. Bibliography entries from various databases
Oct 8	7	Correlational Research Quiz 1	Chapter 15 Gay Chapter 11	
Oct 15	8	Causal - Comparative Research Presentation methods	Chapter 16	1. d. Computer search for the research topic
Oct 22	9	Samples, Survey research, Statistical inferences	Chapter 6, 12, 17	
Oct 29	10	Qualitative Research methodologies Historical, Ethnographic Research 3. a. Class presentation - 1	Chapter 18, 21, 22	Draft Research proposal
Nov 5	11	Statistics & Measurement 3. a. Class presentation - 2	Chapter 10, 11	
Nov 12	12	Data, Data Analysis Quiz 2	Chapter 7, 12	
Nov 19	13	Reporting of research and evaluating	Chapter 10, Creswell	Draft Research proposal
Nov 26	14	Thanksgiving Break		
Dec 3	15	3. b. Research Proposal Presentation I		
Dec 10	16	3. b. Research Proposal Presentation II		2. a. Final Research Proposal
Dec 17	17	Final Examination 5-6:50 p.m. in ITC 6		

Course Requirements

The course is planned to include a number of exercises that help in developing the objectives listed earlier in a step-by-step process. They are as follows:

1. Investigative exercises
 - a. Analyze a dissertation or master's thesis
 - b. Valuate two research articles
 - c. Locate and prepare bibliography of articles of interest from various databases available
 - d. Complete a computer search of an item
2. Proposal Activities
 - a. Research Proposal
3. Presentations
 - a. Class Presentation on a specific topic
 - b. Research Proposal Presentation

Quizzes

Two quizzes will be given during the semester covering assigned readings, in class discussion, lecture, and presentations. Each quiz may consist of multiple choice, true/false, and short answer format. If missed there will be **no** opportunity to make up missed quizzes.

Final Exam

A final examination will culminate all material covered, discussed, or read during the semester. Questions will require essay responses.

Research Proposal Activities:

Develop and write a research proposal which describes a potentially acceptable investigation for a thesis. The proposal should incorporate information from class, follow guidelines from handouts, texts, and reference in accordance with Departmental and Graduate College standards and APA Manual. The proposal will be comprised of the following elements:

1. Title page
2. Table of contents
3. Introduction
 - a. Literature survey
 - b. Statement of the problem
 - c. Statement of purpose
 - d. Purpose of the study
 - e. Statement of Need and justification
4. Hypothesis/research questions
 - a. Questions to be answered
5. Body
 - a. Assumptions
 - b. Limitations and/or delimitations
 - c. Statement of Procedure
 - d. Definition of terms
 - e. Outline of procedures to be employed
 - f. Statistical or other analysis of the data
6. Summary of ensuing chapters
7. Reference list
8. List of appendices, e.g., Human Participants Review Form

The proposal elements must be word-processed using 10 or 12-point Times New Roman font.

Proposal Presentation

Give a 20 minute (maximum) presentation to explain and defend your proposal in an oral fashion. Other requirements to be observed: use power point, handouts, organized structure, clarity, and thoroughness. (Session 15 and/or 16)

Grading Assignments

A **final** grade for the course will be based on the following allotments:

Investigative exercises (4)	25%
Presentations (2)	10%
Research proposal	40%
Quizzes (2)	10%
Class participation	5%
Final Examination	10%
TOTAL	100%

It is the policy of the University of Northern Iowa to enable all persons to participate in the academic environment on an equal basis. If you have any special needs with regards to seating, access to media or any other part of the course, please contact us.

Grade scale:

Percentage range	Grade	Percentage range	Grade
95 – 100	A	74 – 76	C
90 – 94	A-	70 – 73	C-
87 – 89	B+	67 – 69	D+
84 – 86	B	64 – 66	D
80 – 83	B-	60 – 63	D-
77 – 79	C+	< 60	F

Academic dishonesty: Cheating of any kind on examinations and/or plagiarism of papers or projects is strictly prohibited. Consult the 2008-2010 UNI catalog (pp. 42-44), "Academic Ethics Policies," for complete information. Any one caught passing off the work of others as their own (i.e., copying from a book/journal or cut and pasting from internet sources without appropriate citation) runs the risk of immediately failing the course and expulsion from the class and the University. Any plagiarized assignments will receive failing grades, and further penalties may be applied as well. When presenting information in written or verbal form, keep this concept in mind: **Always note complete citation and indicate words or wordage, which are quoted, cited, or paraphrased from another persons'** writing. For more institutional rules regarding academic dishonesty, please see the University catalogue on "Academic Ethics Policies".
([www.uni.edu/dise/Academic Ethics Policies.doc](http://www.uni.edu/dise/Academic%20Ethics%20Policies.doc)).

Special needs: The Americans with disability Act of 1990 provides protection from illegal discrimination for qualified individuals with disabilities. Students requesting instructional accommodations due to disabilities must arrange for such accommodation through the Office of Disability Services. The ODS is located at 213 Student Services Center, and the phone number is (319) 273 2676.