

Technology Management and Economic Development MGT 518

COURSE INSTRUCTOR

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General Information

- 1) If you are a qualified person with disabilities who might need appropriate academic adjustments, please communicate with me as soon as possible so that we may make appropriate arrangements to meet your needs in a timely manner. Frequently, we will need to coordinate accommodating activities with other offices on campus.
- 2) Prerequisites: The course is designed for students who have had work or educational experience in business and/or technology management: if you do not have a bachelor's degree in business or have taken the majority of your core courses and MGT 511, then you are taking this course too early in your educational experience and you are better off taking it after you develop some of these experiences.
- 3) Proper etiquette for research papers:
 - a) The simple rule is "give credit to the originator of the idea" You can do this by referencing their work: for example, Saloner and Spence [2002] indicated that and then give full citation through footnotes, endnotes or bibliographic references to Saloner and Spence's published work, interviews, etc.
 - b) If you are going to use the words verbatim of an author, you should put the words in quotes and you should not use more than a paragraph and preferably much less. You can reference the work and rephrase the main ideas of the content to fit the purposes of your writings.
 - c) Do not depend on one argument, one author or one expert: start with the work that they have done but add value to it by coming up with something novel/new. Copying a paragraph from this author and a paragraph from another does not make the two paragraphs new work: it is still someone else's work.
 - d) Anyone in today's world can write something on the internet. That does not mean that it is correct or worth the pixels used. As with all information, knowing the validity, expertise and reputation of the source is important.
- 4) Dropbox: I will invite you to a shared drop box that we will use: I will post all of the materials and power points for the class on the drop box and you will submit the papers, presentations on there. I will give you feedback on the papers/presentation on there as well.

COURSE SYLLABUS

This course is offered as an advanced hybrid seminar in the Management of Technology (MOT) area specifically but deals with general tenets of sound business practices in many sub-

disciplines. It examines the importance of technology management and the resulting technology transfer and commercialization activity to the economic development in general and to our local economy specifically. The course will examine many of the theoretical bases for economic development and the different programs that have been designed and implemented by many different organizations. The State of New Mexico, The Federal Laboratories, The University of New Mexico, City of Albuquerque and many other governmental and private organizations have indicated that this issue is of extreme importance to them. They all implemented programs that are designed to enhance the economic development of the state, the region and the country. The private sector plays an important part in this development because of the importance of the individual entrepreneur in this area. The different philosophies as well as the theoretical and practical issues will be presented in this course.

Students are encouraged to examine many of the different issues that face New Mexico since this is intended as a course that will share our research and its results with the policy makers who impact economic development in NM. Students are encouraged to research some of the areas in which they are interested as part of the preparation for the course. Students are encouraged to participate in class discussion using opinions that are supported by research.

BOOKS:

We will use materials from three books (*It is not necessary to buy these books since I will put the power points I built for these chapters in the drop box. The topics are broad but are designed to identify issues in the business of economic development (the 'how, why, where and when' economic development activities are impacted by technology in its many forms)*)

If you want to get the books, you can get these books from Amazon and other discount internet bookstores)

- 1) Edward J. Malecki. *Technology and Economic Development*. Addison Wesley Longman, Harlow, England, 1997. (EM)
- 2) Manuel Castells and Peter Hall. *Technopoles of the World: The Making of 21st Century Industrial Complexes*. NY: Routledge, 1994. (CH)
- 3) Zoltan Acs. *Regional Innovation, Knowledge and Global Change*. London: Pinter, 2000. (ZA)

Other Books of Interest

- Edward J. Blakely, *Planning Local Development: Theory and Practice*, Newbury Park, CA: Sage Publications, 1989.
- Peter K. Eisinger, *The Rise of the Entrepreneurial State: State and Local Economic Development Policy in the United States*, Madison, WI: University of Wisconsin Press, 1988.
- Richard D. Bingham and Robert Mier (eds.), *Theories of Local Economic Development*, Sage Publications, Newbury Park, CA: 1993.
- C.M. Coburn, editor. *Partnerships: A Compendium of State and Federal Cooperative Technology Programs*. Battelle. 1995.

- Philip Cooke and Kevin Morgan, *The Associational Economy: Firms, Regions, and Innovation* (Oxford Press, 1998).
- Michael I. Luger and Harvey Goldstein, *Technology in the Garden: Research Parks and Regional Economic Development*. Chapel Hill, N.C.: University of North Carolina Press, 1991.
- Stuart Rosenfeld, *New Technologies and New Skills: Two Year Colleges at the Vanguard of Modernization*. Chapel Hill, N.C.: Regional Technology Strategies, 1995.
- Michael Piore and Charles Sable, *The Second Industrial Divide*. New York: Basic Books, 1984.
- AnnaLee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Harvard University Press, 1994).
- Michael Storper, *The Regional World*, Guildford, 1997.

RESEARCH RESOURCES

Students are encouraged to examine research done by many others on this topic for their papers and other purposes. Access to information about publications is available on the web and searches through some of the electronic databases (Business Source Complete, Econ Lit, etc. available from <http://eLibrary.unm.edu/>).

ANTICIPATED LEARNING OUTCOMES

Each participant is intended to be able to accomplish the following activities upon completion of this course:

1. To develop an understanding of the theory of economic development as it links to technology management.
2. To understand the impact of technology commercialization on economic development
3. To examine the effect of many of the programs on economic development of the region
4. To examine the role of the entrepreneur in getting technology commercialized so that job creation is enhanced
5. To appreciate the knowledge needed in today's (and tomorrow's) work environment and the success and failure factors in reaping the benefits of applying technology to new products, processes and services.
6. To analyze and apply the industry practices in economic development based on technology.
7. To become familiar with data sources which provide information and insights into economic development.

COURSE OUTLINE

We have a large number of things to do in this course:

- a. Cover the important issues through the power point slides and lectures.
- b. Discuss important aspects of economic development and how it ties to technology
- c. Students are asked to spend time researching and reading materials that form the basis for their papers
- d. Students will work on individual papers: *more on the paper topics and requirements below*

INDIVIDUAL PAPERS

Students are expected to work *individually* on a paper that examines a technology area and how it can affect New Mexico's future economy. In analyzing your technology of choice, many of the technology, competitive, social and other factors that we discuss in economic development need to be examined. These factors can range from entrepreneurship, incubators, incentives, tax structure, transportation logistics, telecommunications logistics, power logistics, water resources, capital, education, quality of life, creative population, social networks, R&D and intellectual property, etc.

Technology areas include (not in any order):

- i. Nanotechnology
- ii. Microsystems/MEMS: sensors
- iii. Computer Security
- iv. Supercomputing
- v. Water: remediation, desalination, etc.
- vi. Energy: solar, wind, geothermal
- vii. Biomass energy: sugar cane ethanol, corn, algae, etc
- viii. Directed Energy: lasers
- ix. Genome research
- x. Aerospace
- xi. Financial Services
- xii. Oil and gas exploration
- xiii. Nuclear medicine: using isotopes
- xiv. Biomedical diagnostics especially cancer
- xv. Biomedical therapeutics especially cancer
- xvi. Other: please suggest and justify

There are many areas that are touted by people who are "pushing" one technology or another due to their interest/benefit in that technology and its funding, etc. We will stay away from broad statements that are not borne by facts so statements by any group should be analyzed using facts rather than opinion. For example, if I say that "biomass" is a hot area that can solve the energy problems of the world, it is important that you examine the research about the technology, its contribution to an economically viable solution, its capabilities, costs, benefits, needs in terms of a workforce or investment needed to make it work among many other issues that a "prudent investor" will examine.

- 1) **Paper I:** The first paper will be a literature review paper. The literature review is to define the technology area, the problem area(s) that it will solve, who has done what in that area (our competitors in research and therefore in implementation and technology commercialization), what needs to be done to take the research results and make them real in terms of economic realities. Analysis is important here so do not depend on other people's ideas ONLY, use your own judgment and ideas. You should find many references to have a rich set of ideas with which to work. You might not use all of them

but this gives you a good feel for the issues that experts have identified as being important. Use full referencing for your paper as follows:

Books:

Alan L. Porter, A. Thomas Roper, Thomas W. Mason, Frederick A. Rossini and Jerry Banks. 1991. *Forecasting and Management of Technology*. N.Y: Wiley, 291-299.

Articles:

J. P. Martino. 2003. "A review of selected recent advances in technological forecasting." *Technological Forecasting and Social Change* 70(8): 719-33.

Other:

Web pages: list the full link to material

Interviews: list name, title, date of interview.

- 2) **Paper II:** How can NM benefit from the implementation of this technology, what needs to be done, who can do it and why? What will it cost, what economic benefits (wealth, jobs, etc.) can accrue from them and the reason you would chose this as a platform for economic development. This paper should contrast the world's capabilities against NM's in this area and proves NM's viability as a competitor in this area. It should also provide a justification to the NM executive branch, legislature and public that an investment in this area of technology will be "good" for the state as an area that has sufficient ROI.

Note: the two papers are in essence a (business) plan for NM to engage in economic activities in this technology area: the plan includes what needs to be done, by whom, funding required, etc. so think of this as a strategic analysis of the area of technology

PAPER LOGISTICS:

1. The first paper is due on March 23.
2. Final Papers are presented on April 26 and May 3. Final papers are due May 10 by 5:00pm.
3. All correspondence, proposals, papers should be through e-mail.

GRADING

Since this is an advanced seminar and each student is responsible for his/her own learning as well as sharing of such learning with other participants, grading will depend heavily upon class participation and the individual papers. The final grade in the course will be determined by adding all points scored and by establishing the natural breaks (usually large differences) between groups of scores.

First paper	300 points
Final Paper	400 points

Paper presentations
Total

300 points
1000 points

CLASS SCHEDULE

Session 1 (January 20)

Syllabus and Course Introduction
EM Chapter 1
CH Chapters 1 and 2

You should set up a one-on-one meeting with instructor sometime in the next couple of weeks. Work on your library exploratory research to identify your topic and to start completing your project proposal. Your proposal should have enough material to allow instructor to comment on issues. You should set a time (15-30 minutes) between January 20 and February 15 to discuss the topic with instructor)

Instructor also will invite each student to share a “drop box” using your e-mail (one that you put on your student info form that you fill at the first class meeting) so that I can put the syllabus, power point slides, papers, etc. there for you to access. This is our way to exchange information: you submit your papers there and I will grade and put comments on papers in the drop box as well.

Session 2 (January 27)

EM Chapter 2-3
Kassicieh paper “**Factors of Entrepreneurial Activities in Technology-Based Economic Development**”

Session 3 (February 3)

EM Chapter 4
ZA Chapter 2
Research your topic, write your proposal

Session 4 (February 10 NM)

ZA Chapter 6
Research paper

Session 5 (February 17)

Project proposals due: please put in drop box
Research paper

Session 6 (February 25)

EM Chapter 5

ZA Chapter 6
CH Chapter 4

in-class discussion on proposed regions

Session 7 (March 2)

ZA Chapter 7
Research paper

Session 8 (March 9)

CH Chapters 5-6
Research paper

Spring Break: March 14-18

Session 9 (March 23)

Presentations of first paper

Session 10 (March 30)

CH Chapters 7-8
Research paper

Session 11 (April 6)

ZA 9
Research paper

Session 12 (April 13)

ZA Chapters 10, 11, 13
Research paper

Session 13 (April 20)

Work on presentation

Session 14 (April 27)

Paper presentations
Presentations (20-25 minutes each)

Session 15 (May 4)

Paper presentations if needed
Presentations (20-25 minutes each)

Projects DUE Monday May 9 BY 5:00PM