ECE 590
EMERGING TECHNOLOGIES

OVERVIEW: This course studies emerging technologies, how they are identified, how they evolve, actions which may encourage or stifle their growth, government influences, societal influences, examples of success and failure, and some lessons to be learned which are unique to government information technology. Topics covered will include a general introduction to emerging technologies, with emphasis on IT, discussion of difficulty in letting go of legacy systems, investment strategies for technical companies, emerging technologies in the intelligence community, Cyber Security, Federal Government support of Research and Development, and specific technology topics such as Virtualization, Open Source-Internet protocols, Geospatial Information Systems, etc.

COURSE GOALS: Upon completion of the course, the student will be able to a) identify emerging technologies b) analyze examples of successful management of emerging technologies c) suggest appropriate actions to encourage and promote emerging technologies d) communicate the importance and potential impact of an emerging technology.

Requirements: The course will employ lectures, guest speakers, class discussion, individual and team presentations, case analyses, and quizzes. Students will be asked early in the course to identify an emerging technology and prepare a 5-8 minute presentation/proposal on how and why they would study and report on it in more detail. The instructor will select 4-5 topics and ask students to form into groups for presentations near the end of the term. There will be two quizzes, one at about mid way through the term and one at the end (non-cumulative).


Supplemental Readings (to be provided by instructor):

“Mastering the Three Worlds of Information Technology”, Andrew McAfee, Harvard Business School Case, R0611J.


“Learning from Corporate Mistakes: The Rise and Fall of Iridium”, Finkelstein and Sanford,

“Good technology, Bad Management: A Case Study of the Satellite Phone Industry, Lim, Klein, and Thatcher, J. of Information Technology Management, ISSN# 1042-1319.


“USAF Cyberspace Command: To Fly and Fight in Cyberspace, William T. Lord, Strategic Studies Quarterly, Fall 2008.


“Innovation and Commercialization of Emerging Technology”


CLASS SCHEDULE

1 Introduction to Emerging Technologies – Sept 2
   a. Textbook, Preface and Ch 1, “A Different Game”
   b. Social and Digital Media Video
   c. Case Study - “Master the Three Worlds of IT”

2 Legacy Systems – Sept 9
   a. Textbook, Chapter 2, “Avoiding the Pitfalls of Emerging Technologies”
   b. Webcast – Securing Intellectual Property
   c. Case Study - “Leading Change”

3 Investment Strategies for Technical Companies – Sept 16
   a. Textbook, Chapter 13, “Financing Strategies and Venture Capital”

4 Emerging Technologies in the Intel Community – Sept 23

5 Technology Speciation and Assessment – Sept 30
   a. Textbook, Ch 3, “Technology Speciation and the Path of Emerging Technology”
   b. Biometrics Case Study – Technology Insertion the Federal Government

6 Visit to GMU’s Air Traffic Research Center - George Donohue – Oct 7

7 Assessing Future Technology Markets and Planning for Disruptive Technology – Paul Strassman – October 14
a. Textbook Ch 4, “Identification and Assessment of Emerging Technologies”

b. Virtualization and Cloud Computing

8 Quiz and Individual Presentations – Oct 21

9 Geospatial Information Systems and Applications – Oct 28

10 Government Influence on Technology - Nov 4

   a. In-Q-Tel Case Study - “Innovation and Commercialization of Emerging Technologies”

11 Textbook Ch 5, “Emerging Technologies and Public Policy - Nov 11

   a. The intersection of computation and data analysis (large scale, parallelized data processing)


   a. KZO Innovations, “Multimedia Environment for Perpetual Knowledge Exchange and Communication

13 Nov 25 – Holiday

14 Team Presentations – Dec 2

15 Quiz 2 - Team Presentations – Dec 9