**Communication Technology and Innovation - Com. 4490**

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| **Intelsat_IX** | **Richard A. Gershon, Ph.D.**  **School of Communication**  **Western Michigan University**  **1903 West Michigan Ave.**  **Kalamazoo, MI 49008**  **Tel. (269) 387-3182 (Office)**  **Fax. (269) 387-3990**  **Email:** [**Richard.Gershon@wmich.edu**](mailto:Richard.Gershon@wmich.edu)  **Web Site:** <http://www.rgershon.com/courses-taught>  <http://www.rgershon.com/digital-media>  **Office Hours: T. 1:30-3:00 PM or by Appointment**  **Sprau Tower, 324** |

**Course Description and Outline**

From smart phones to smart cities, this course will examine a number of media and information technologies that have transformed the business of communication. It is intended for the working professional who requires an applied understanding of the design characteristics and performance features of several important communication technologies including cable television and smart homes, digital media and electronic commerce, satellite communications, smart phones and wireless communication, intelligent networking and virtual reality.

Part of our assignment involves taking a closer look at a number of issues pertaining to   
the social use of media and information technology. Special attention is given to such topical issues as digital lifestyle and personalization, social networking (Facebook, Twitter etc.), human/computer interface design as well as select theories of communication technology, including *Innovation and Design theory*, *Diffusion of Innovation*, *Innovator’s Dilemma*, *Social Presence* and *Media Richness theory*.

A second goal of this course is to look at the subject of innovation. Today, innovation is

about much more than developing new products and services. It is about reinventing business

and organizational processes and building entirely new markets to meet untapped customer

needs. Innovation is about taking organizations built for efficiency and rewiring them for

creativity and growth.

**Required Reading and Materials**

1) Richard Gershon, ***Digital Media and Innovation***. Sage, 2017.

2) Richard A. Gershon, ***Com. 4490 Course Pack***, including a full set of power point slides.

The Com. 4490 course pack will be available at the WMU bookstore located in the Bernhard

Center.

3) A three ring binder -- with section tabs for 12 units

**COURSE OUTLINE AND PRESENTATIONS:**

**Week of**

**INNOVATION AND THE DIGITAL MEDIA ENVIRONMENT**

Jan. 9. **INNOVATION and TECHNOLOGY MANAGEMENT**

Innovation Defined

Sustaining v. Disruptive Technologies

Innovation and Lasting Advantage

Three Kinds of Innovation

* Product Innovation
* Process Innovation
* Business Model Innovation

Blue Ocean Strategy (W. C. Kim and R. Mauborgne)

Principle of Value Innovation

Jan 16. **THE ELECTROMAGNETIC SPECTRUM**

Radio Waves

Frequency and Wavelength

AM & FM Broadcasting

Attenuation Factors

Spectrum Planning and Applications

* Radio Frequency Identification (RFID)
* WIMAX

The Demand for Wireless Capability

Jan 23.  **DIGITAL MEDIA and INNOVATION**

***KEY TECHNOLOGIES AND SERVICES***

What is Digital Media?

Principles of Analog and Digital Communication

Analog to Digital Conversion

* Principles of Sampling
* Pulse Code Modulation
* Digital Video Compression

Advantages of Digital Communication

Digital Media and Technology Profiles:

* Digital Photography
* Animation and Film
* Digital Television, HDTV

Jan 30. **PRODUCT INNOVATION**

Feb. 1.

Ideation

* Idea Development and Synthesis

New Product Development

Product Design

The Design Philosophy of Dieter Rams

* Sony Corporation
  + Akio Morita, the Sony Walkman
  + Norio Ohga, the Compact Disk
* Apple
  + Steve Jobs, the PC, iPod and iTunes
  + Mp3 Music Downloading
* Pixar
  + John Lasseter
  + Film Animation and RenderMan

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**End of Unit I.**

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**Feb. 6. EXAM I.**

**Monday**

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Feb. 8. **SMARTPHONES, TABLETS AND WIRELESS** **DATA**

Wed. ***KEY TECHNOLOGY AND SERVICE***

Cellular Telephone Networks

System Design Features

* Cell Site
* Cellular Tower
* Mobile Telephone Switching Office
* Cellular Mobile Telephone

Cellular Telephone Multiple Access Systems

* CDMA, GSM

Smart Phones

* Apple iPhone, Samsung Galaxy, Microsoft/Nokia

Computer Tablets

Feb. 13 **BUSINESS PROCESS INNOVATION**

Creating Entirely New Systems of Operation

* How Work Gets Done Within the Organization

Theoretical Traditions

* Total Quality Management
* Six Sigma
* Reengineering
* Netflix
  + Reed Hastings
  + Proprietary Recommendation Software
* Walt Disney Company
  + Walt Disney
  + Customer Service is a Business Process
  + Guest Flow and Transportation

Feb. 20. **SATELLITE COMMUNICATION**

***KEY TECHNOLOGY AND SERVICE***

Satellite Communication Networks and Design

Uplinks / Downlinks

Satellite Footprints

Transponders

Geosynchronous v. LEO Orbits

Satellite/Cable Networking

Point-to-Multipoint Applications:

* Broadcast and Cable Satellites
* Direct Broadcast Satellites
* Mobile Satellite Communication
* Weather and Environment
* Voice and Data (VSATs)
* Global Positioning Systems (GPS)

Satellite Design Features

Antenna Subsystems

Transponder Subsystems

Power Supply

Satellite Deployment

Telemetry, Tracking and Command

Satellite Design

Spin v. Body Stabilized

Earth Station Design and Performance

Feb 27. **BUSINESS MODEL INNOVATION**

Mar. 1.

Creating a New Business Model

Blue Ocean Strategy (T), Kim & Mauborgne

Value Innovation: Value Proposition to the Consumer

Transformative effect on the marketplace

The Long Tail (T), C. Anderson

Electronic Commerce

* Amazon.com
  + Exchange Efficiency
* Google
  + Key-word Search Advertising

Boundary Spanning (T), R. Gershon

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**End of Unit II.**

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**SPRING BREAK: March 6 - 10**

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Mar. 13. **WHY COMPANIES FAIL TO INNOVATE**

Mon.

The Innovator’s Dilemma (C. Christensen)

The Innovator’s Dilemma and Product Life Cycle

Organizational Issues

* The Tyranny of Success
* Organizational Culture
* Organizations Lose their Agility and Sense of Urgency
* Lengthy Development Times – Poor Coordination
* Failures in Execution Strategy
* Organizations Become Risk Averse

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**MAR 15. EXAM II.**

**Wednesday**

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Mar. 20 **THE INTELLIGENT NETWORK**

Mar. 27 ***KEY TECHNOLOGY AND SERVICE***

TheIntelligent Network Defined

The ITS Model: Internal System Structures

* Hierarchical Ordering
  + Class 5. Telephone Switching
* Interdependency
  + Financial Credit (Credit cards)
* Exchange
  + Electronic Commerce (Amazon)
* Equifinality
  + Packet Switching (VOIP)
* Redundancy
  + Signaling Theory, Security and Compliance
* Adaptation
  + Artificial Intelligence

Internal System Processes

* Network Holism
  + The Internet
* Permeability (and Permeability Predicament)
  + Privacy Invasion, Internet Fraud

The ITS Model: System Outcomes

* Decentralization
  + The Transnational Corporation
* Virtual Communication
  + Videoconferencing, Global Virtual Teams
* Interactivity
  + Computer Interface Design, Cloud Computing
* Mobility
  + Laptop Computers, Smartphones and Tablets
* Personalization
  + Proprietary Recommendation Software (Netflix, iTunes)
* Immediacy
  + Internet News Sites
* Convergence
  + Internet Protocol Television (IPTV), Videogame Systems

Apr. 3 **DIFFUSION OF INNOVATION**

Initiating Change

Understanding User Resistance

*Diffusion of Innovation,* Everett Rogers

* Intended v. Unintended Consequences

Tipping Point, Malcolm Gladwell

Digital Lifestyle

High Tech – High Touch

Apr. 10 **DATA MODELING, SIMULATION AND ARTIFICIAL INTELLIGENCE**

Apr. 17

Data Modeling and Simulation

* CAD/CAM Programs

Geographic Information Systems

* Google Maps

Virtual Reality

* Flight and Combat Simulation
* Medical Surgery Simulation

Artificial Intelligence

* Intelligent Agents

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**End of Unit III.**

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**Apr 24. EXAM III.**

**Monday 5-7PM**

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**Attendance**

Very simply . . . Attendance makes a difference. . . You are permitted two excused

absences no questions asked. Any additional absences may result in a lowering of your

final grade. Please use your excused absences carefully. They become especially

important later in the semester when and if you have a family commitment or professional

obligations.

**Use of Laptop Computers and Smartphone**

In addition to power point slides, taking good notes is essential in this class. If using   
a laptop computer is helpful, I encourage you to do so. However, if you use your laptop computer for any other purpose other than taking notes (and the occasional applied

assignment), I will require that you leave your computer at home for the duration of   
the class. The same goes for smartphones. The rationale for this is simple. Surfing the   
web (or checking email) during class is both unprofessional and disrespectful to both   
your peers as well as me. I have every confidence that this won’t be an issue.

**Evaluation**

There will be three exams and a project assignment that will be given in class.

The combination of exams and project are each worth 25% of your grade.

**Grading Scale**

93-100 A 70-75 C

87- 92 B/A 65-69 D/C

82- 86 B 60-64 D

76- 81 C/B -59 E