

Technology Education Program

Rhode Island College
Feinstein School of Education and Human Development
Department of Educational Studies

Spring Semester 2011

Dr. Charles H. McLaughlin, Jr.

Phone: (401) 456-8793

Office Hours: Tuesday & Thursday 9:00 - 10:00 and By Appointment

Office: HBS 208

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Communication Devices: Out of courtesy for other students and the instructor, please silence and place out of sight all communication devices (cell phones, smart phones, etc.) during class time so that we may learn and work together without distraction. Texting and the use of cell phones is prohibited during this class.

Schedule: The schedule and topics of this class are subject to change, but we will try to maintain the schedule as provided.

I COURSE TITLE: TECH 310-01 Historical Innovation and Invention
CLASS HOURS: Monday - Wednesday 10:00 - 11:50
CLASSROOM LOCATION: WH 100

II PREREQUISITES: None

III TEXT:

McClellan, J. & Dorn, H. (2006). *Science and technology in world history : An introduction*. Johns Hopkins Univ. Press. Second Edition. ISBN: 0801883601

IV CATALOGUE DESCRIPTION:

The study of technological developments and their impact on education, careers, social structures; and the awareness of heightened environmental and individual concerns related to the use of technology.

a. Relationship to Feinstein School and Professional Development

This course is designed to introduce students to historical development of technology. The study of technology, innovation, invention and inventors will create awareness of the significant efforts and impacts technology has had in shaping society. This class taken in conjunction with the other core technology

education classes provides an overview of the development, societal impacts, and future implications of technology. Coursework is designed to address human abilities to integrate resources to solve social-technical problems. An understanding of present events can be developed through the study of past movements and inventors from other cultures. Interpretation based on historical evidence can be used to avoid past mistakes and provide a direction for action when dealing with present day problems.

Students will reflect on, analyze, select, and implement new and contemporary methods, activities, and curricula related to the use of technology. Students will be introduced to technological principles and cross-curricular opportunities to solve problems related to innovation and invention in the scientific and technological realms. Students will be prepared to teach others about the historical development of technology using strategies appropriate for pre-service teachers.

Participants in this course shall benefit from a consistent best practice scenarios and the intentional use of models that overtly identify global attitudes and diverse populations in the technology education classroom. This technology education course is grounded in FSHEd's Conceptual Framework and the PAR Model embraced by Rhode Island College.

V COURSE GOALS:

As a result of participating in this class, students will be able to:

1. analyze the historical development of technology.
2. identify the interactions of society, the environment, and technology.
3. communicate interpretations of historical events.
4. create chronological sequences of historical technological events. (posters, web pages, video, and reports)
5. identify inventors and entrepreneurs who assisted technical change.
6. evaluate the scale of technological change during various eras.
7. use various resources and people to research historical technological development.

VI CLASS ATTENDANCE POLICY:

Students should attend all class meetings and are responsible for all class work and assignments. At the beginning of each semester, instructors will distribute a syllabus, which may include attendance and/or class participation as a component of the course grade. Students who are absent must take the initiative to determine from the instructor what course work can be made up. Students who are absent on the day of an examination should make every effort to call the instructor (or department office) before the scheduled test.

....All students who incur or anticipate an extended absence (five or more consecutive days or more) should call the Office of Student Life at 456 - 8061, so that notice (not an excuse) may be sent to instructors. (p. 38 RIC Student Handbook)

- The policy of this class is that after the THIRD absence the final grade will be dropped one letter grade.
- Six unexcused absences from this class will result in a final grade of (F).
- Absences are considered excused only when official documentation of the nature of the absence is supplied by the student. (i.e. attending physician's notice, court documents, obituaries, field trip memo)

All exams and quizzes will be taken at the scheduled time. Make-up exams and quizzes may not be provided unless proper documentation is presented.

VII COURSE CONTENT:

- I. Introduction to Innovation & Invention
 - A. Definitions
 1. Science
 2. Technology
 3. Innovation
 4. Invention
 5. Artifacts
 6. Local icons
 - B. Elements of Modern Technology
 1. Technical systems
 2. Human (Societal) systems
 3. Natural (Environmental)
 - C. Culture
 1. Needs
 2. Attitudes
 3. Beliefs/Values
 4. Industrial countries
 5. Developing countries
- II. Development of Innovation
 - A. Ancient Technologies
 1. Early Applications of Tools & Techniques
 2. Primitive Inventions & Inventors
 3. Toolmakers Take Command
 4. Identifying Resource
 5. Creating Environmental Changes
 6. Gathering the Evidence
 - B. Plows, Stirrups, Guns, and Plagues
 1. Technologies of the Agricultural Society
 2. Societal Developments
 - C. Sharing Techno/Agricultural Systems
 4. The Emergence of the Town
 - C. Industrial Revolution
 1. Early Industries
 - a. Mining
 - b. Metals
 - c. Sailing Ships
 2. Industrial Age in England
 3. Manufacturing Systems in America
 4. Slater and His Contemporaries
 - D. 19th Century Developments
 1. 1800's Renowned Tinkerers
 2. The Age of Inventions/Inventors
 3. Dispersing Systems
 4. Invention: Mother of Necessity
 - E. Technologies of the 20th Century
 1. Contemporary Inventions/Inventors
 2. Origins of Flight
 3. Trends of the Information Age
 4. Glimpse of the Atomic Age
 3. Space: The Final Frontier
 4. Third World Development
- IV. Applied Science and Technology Today
 - A. Shaping the Future
 1. Communication
 2. Construction
 3. Manufacturing
 4. Transportation
 - B. A Brave New World:

- Emerging Technologies
1. Medical
 2. Nuclear
 3. Bio-Technologies/Agricultural

4. Aerospace
5. Materials Science
6. Earth/Ocean Studies

VIII METHODS OF INSTRUCTION:

Instructional strategies will include:

- Lecture
- Multimedia
- Individual reports
- Group interaction
- Electronic media
- Discussion / Question and answer

IX EVALUATION:

Innovation and Invention Presentation	25%	
FINAL Activity Inventions & Innovators		20%
NASA spin-offs	10%	
Invention Timeline	10%	
Class projects	15%	
2 Historical Site visits/reports	10%	
2 Quizzes	10%	
TOT	100%	

Final course grades are assigned on the basis of total points earned from exams, quizzes and projects. All points earned during the semester will be totaled and a percentage will be determined from the points earned. The final grade will be determined from the following percentages.

Grade Scale:

A	100% - 96%	C+	79% - 76%
A-	95% - 90%	C	75% - 73%
B +	89% - 86%	C-	72% - 70%
B	85% - 83%	D	69% - 60%
B-	82% - 80%	F	59% or less

X Selected Bibliography and Course Resources

Basalla, G. (1990). *The evolution of technology*. New York, NY: Cambridge Press.

Cross, G & Szostak, R. (1995). *Technology and American society: A history*. Englewood Cliffs, NJ: Prentice Hall.

Marcus, A. & Segal, H. (1989). *Technology in America: A brief history*. San Deigo, CA: Harcourt Brace Jovanovich Publishers

Pacey, A. (1990). *Technology in world civilization*. Cambridge, MA: The MIT Press.

Petroski, H. (1994). *Design paradigms: Case histories of error and judgment in engineering*. New York, NY: Cambridge Press.

Volti, R. (1995). *Society and technological change*. New York, NY: St Martin's Press.

Exhibitions and Museums:

<p><i>Museum of Work & Culture</i> 42 South Main Street (Market Square), Woonsocket, RI 02895 401-769-9675; 401-767-2905 (fax) Tuesday - Friday 9:30 to 4; Saturday 10 to 4; Sunday 1 to 4</p>	<p><i>John Brown House Museum</i> 52 Power Street Providence, RI 02906 401-331-8575; 401-751-2307 (fax) Tuesday - Saturday 10 to 5; Sunday noon to 4 Open some Monday holidays; call for hours</p> <p>http://www.rihs.org/libraryhome.htm</p>	<p><i>Library of Rhode Island History</i> http://www.rihs.org/ 121 Hope Street, Providence 401-331-8575; Tuesday through Saturday, 9 am to 5 pm -- Sundays, Mondays and major holidays, closed. Appointment needed for Manuscripts and Graphics Divisions. No admission charge, but a \$3.00 donation is recommended for non-members.</p>
<p><i>Rhode Island Historical Society</i> Aldrich House, 110 Benevolent Street, Providence, RI 02906 401-331-8575; 401-351-0127 (fax) Tuesday - Friday 9 to 5;</p>	<p><i>The New England Wireless and Steam Museum</i></p> <p>1300 Frenchtown Road East Greenwich, RI 02818 USA Telephone: 401-885-0545 Robert W. Merriam, Director</p>	<p><i>Slater Mill</i></p> <p>67 Roosevelt Avenue. Pawtucket, RI 02860</p> <p>A National Historic Landmark Site, Slater Mill is accredited by the American Association of Museums and is the cornerstone of the John H.</p>

	http://www.newsm.org/	Chafee Blackstone Valley National Heritage Corridor. http://www.slatermill.org/museum/
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Important Web Sites:

Plymouth Colony: <http://www.plimoth.org/>

The Monarch Corliss Steam Engine:
<http://www.vintagesaws.com/library/steam/steam.html>

NASA Technology Transfer: <http://www.sti.nasa.gov/tto/spinoff2003/spin03.pdf>
<http://www.sti.nasa.gov/tto/>

The Apollo Program: <http://www.nasm.edu/apollo/>

The Henry Ford Museum: <http://www.thehenryford.org/museum/default.asp>

Aviation Image Archives:
<http://www.landings.com/landings/pages/images.html> - images

Hopewell Anthro people:
http://www.ohiohistorycentral.org/ohc/archaeol/p_indian/pictures/hopepeop.shtml

Hopewell People: <http://www.nps.gov/hocu/>

America Chronology (Hopewell):
<http://www.ohiohistorycentral.org/entry.php?rec=1283>

America Chronology: (Adena):
<http://www.wvculture.org/history/mounds.html>

<http://thenagain.info/WebChron/NorthAmerica/Adena.html>

DaVinci:
<http://www.mos.org/leonardo/>
<http://leonardo.net/west.html> - start

Early Toolmakers:
<http://esciencenews.com/articles/2009/08/13/early.modern.humans.use.fire.engineer.tools.stone>

Inventors:

<http://www.invent.org/index.asp>

Invention Finder:

<http://www.ideafinder.com/history/>

Automobile:

<http://inventors.about.com/library/inventors/blcar.htm>

P-38: <http://www.skylighters.org/encyclopedia/rationopener.html>

Timeline of Inventions:

http://inventors.about.com/od/timelines/Timelines_of_Invention_and_Technology.htm

Tentative Schedule
TECH 310-01
Historical Innovation & Invention

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Pt. I. From Ape to Alexander

Week 1 Ch. 1. Humankind Emerges: Tools and Toolmakers
Jan. 24 - 26 Ch. 2. The Reign of the Farmer

Week 2 Ch. 3. Pharaohs and Engineers
Jan. 21 - Feb. 2 Ch. 4. Greeks Bearing Gifts

Pt. II. Thinking and Doing among the World's Peoples

Week 3 Ch. 5. The Enduring East
Feb. 7 - 9 **Invention Timeline Due**

Week 4 Ch. 6. The Middle Kingdom
Feb. 14 -16 **NASA Spin-offs Due**

Week 5 Ch. 7. Indus, Ganges, and Beyond
Feb. 21 - 23

Week 6 Ch. 8. New Worlds
Feb. 28 - Mar. 2 **Site Visit 1**

Pt. III. Europe

Week 7 Ch. 9. Plows, Stirrups, Guns, and Plagues
Mar. 7 - Mar. 9 Ch. 10. Copernicus Incites a Revolution
Invention Timeline

Week 8 **Vacation Week**
Mar. 15

Pt. IV. A Brave New World

Week 9 Ch. 11. The Crime and Punishment of Galileo Galilei

Mar. 21 - 23	Ch. 12. "God said, 'Let Newton be!'" Ch. 13. The Industrial Revolution
Week 10 Mar 28 - 30	Ch. 14. The Road to Modern Science: Pure and Applied Class Projects Due
Week 11 April 4 - 6	Ch. 15. Life Itself Presentation Due Due
Week 12 April 11 - 13	Ch. 16. Toolmakers Take Command Site Visit 2
Week 14 April 18 - 20	Ch. 17. The New Aristotelians Local Innovators and Inventors Due
Week 15 April 25 - 27	Ch. 18. Applied Science and Technology Today
Week 16 May 2 - 4	Conclusion: The Medium of History