

Technology Education Program

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

Spring 2010

Course Syllabus

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Office Hours: By Appointment

- I **COURSE TITLE: TECH 202 Design in Technology Education
(3 Credits)**
CLASS HOURS: Monday 4pm-7pm
ROOM: WH 101

- II **PREREQUISITES: None**

- III **CLASS CONDUCT: *Communication Devices*** – Out of courtesy for other students and the instructor, please silence all communication devices (phones, pagers, and PDAs, etc.) during class time so that we may learn and work together without interruption.

- IV **CATALOG DESCRIPTION:** Students examine the elements of design necessary for production in a technological society. Emphasis is on design sequence and processes. Techniques for sketching, modeling, and prototyping are introduced.

Relationship to Feinstein School and Professional Development

This course is designed to introduce students to design and problem-solving methods for Technology Education. The study of design will create awareness of the resources and their manipulation to create efficient technological systems. Historical and contemporary design will be investigated to provide insight to the impact of commercial and industrial design on society. Issues related to design impacts and relationships with the individual, society, and the environment will support appropriate problem solving and decision-making opportunities. The directed laboratory experiences emphasize the application of design techniques, including modeling and prototyping. Students will develop an appreciation and understanding of the basic principles of developing, and assessing technological design systems and their products.

Students will reflect on, analyze, select, and implement new and contemporary methods, activities, and curricula related to technology education. Students will be introduced to technological principles and cross curricular opportunities to solve problems related to the development and understanding of technology. Students will be prepared to teach design in technology education using strategies appropriate for pre-service teachers, guided by the Rhode Island Beginning Teacher Standards.

Participants in this course should benefit from a consistent best practice scenarios and the intentional use of models which explore global attitudes and diverse student populations in the technology education classroom. This technology education course is grounded in FSHEd's Conceptual Framework and the PAR Model embrace by Rhode Island College.

V **TEXT: (Required)**

Hanks, K. & Belliston, L (1990). *Rapid Viz: A New Method for the Rapid Visualization of Ideas*. Menlo Park, CA: Crisp Publications.

Hutchinson, J. & Karsnitz, J. (1996). *Design and Problem Solving in Technology*. Albany, NY: Delmar.

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 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.**

Communication Devices: Out of courtesy for other students and the instructor, please silence all communication devices (phones and pagers, etc.) during class time so that we may learn and work together in an undisturbed atmosphere.

VI **NECESSARY MATERIALS:**

- 1 X-acto knife/Stanley Utility Knife
- 1 Jar of Rubber Cement
- 1 Pad of Graph paper
- 1 Pad of Blank white paper
- 1 Compass
- 1 Ruler (English & metric)
- 1 Triangle 30° 60° 90°

- 1 Oval template
- 3 Thin tipped pens
- 3 Mechanical Pencils
- 1 Box of colored pencils
- 1 Box Colored markers
- 3 Sheets of 1/4" foam core
- 1 Jump Drive (Thumb Drive)
- 1 3 ring binder
- 4 rolls of 1/2" masking tape

A portfolio of some sort will be necessary to carry and protect your work. It is not necessary to purchase a leather case. There are many, heavy duty cardboard cases available at most art stores and the RIC book store.

VII LABORATORY EXPERIENCES AND HOURS:

Although lecture is the main method of instruction for this class, there will be a number of activities which will require a few hours of outside work, usually 3 -6 hours per week. Open lab times will be posted when needed. The regularly scheduled class period will be reserved for lectures, demonstrations and other activities.

VIII COURSE OBJECTIVES:

Upon satisfactorily completing this course, the student will be able to:

1. Define the term "design".
2. Identify the design process.
3. Use terminology related to design systems.
4. Produce sketches and renderings of new design ideas and products .
5. Use appropriate media to research product design and evolution.
6. Describe the impacts of design on the individual, society, and the environment.
7. Evaluate the appropriateness of designed products.
8. Design, and produce several models and prototypes of ideas and concepts.

IX TENTATIVE TOPIC OUTLINE

- A. Design & Designing
 - A. Design changes through time
 - B. Design Solutions
 - C. Design & Communication
 - D. Frameworks for design
- B. Design Challenges
 1. Design & Problem Solving
 2. Problems and Opportunities in Design
- C. The Design Process
 1. Identifying problems
 2. Framing the design brief
 3. Problem clarification

D. Research to Support Design

1. Web based
2. Industrial Visits
3. Community resources
4. Library searches

E. Generating Solutions

1. Looking at needs
2. Stating the purpose
3. Context for design

F. Portfolio

1. Documenting Work
2. Sketching and rendering
3. Tools and measurement

G. Graphic production

1. Orthographic views
2. Pictorial views
3. Technical illustration
4. Conventions

H. Material and Prototyping

1. Materials Classification
2. Modeling processes
3. Prototyping

I. Testing and Evaluation

1. Developing Appropriate tests
2. Evaluating results
3. Observation & Synthesis

J. Presentation

1. Graphic
2. Oral
3. Electronic

X METHODS OF INSTRUCTION:

Instructional strategies to reinforce content will include:

- Lecture
- Individual reports/ presentations
- Individual projects
- Laboratory demonstrations
- Group interaction /Seminar
- Discussion / Question and Answer

XI EVALUATION:

Design in Technology Education

Final Grades

| | |
|---|-------------|
| MID-TERM | 10% |
| Final EXAM | 10% |
| Portfolio | 25% |
| Class Projects (these will be documented in your portfolio) | 12% |
| 1 st Design Brief Project | 10% |
| Modeling and Prototype development | 16% |
| Design Brief and Prototype | 17% |
| | 100% |

Final course grades are assigned on the basis of total points earned from exams, projects and attendance (class participation). 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- | 94% - 90% | C | 75% - 71% |
| B + | 89% - 86% | C- | 70% |
| B | 85% - 81% | D | 69% - 60% |
| B- | 80 | F | 59% or less |

XII FINAL EXAM DATE:

When the examination schedule for RIC is posted, students will be notified of the date for the final exam.

XIII Selected Bibliographic Materials

Many of these and other texts can be found at:

International Technology Education Association. (2000). ***Standards for Technological Literacy: Content for the Study of Technology***. Reston, VA: International Technology Education Association.

Norman, D. (1990). ***The Design of Everyday Things***. Doubleday & Company.
ISBN 03-85267746

Porter & Goodman (1992). ***A Treasury of Graphic Techniques***. NY, NY: Simon & Schuster.

Tenner, E. (1997) ***Why Things Bite Back : Technology and the Revenge of Unintended Consequences***.
New York : Knopf

Slafer & Cahill (1995). ***Why design?*** Chicago, IL: Chicago Review Press. ISBN:1-55652-249-5

M. Wright and G. Royle. (1990). ***Approaching Design & Technology***
ISBN 0-7195-4794-6
John Murray Publishers
50 Ablemarle Street
London W1X 4BD

Web Resources You Should Use

America's Leading Design Firm: <http://www.ideo.com/ideo.htm>

How Stuff Works: <http://express.howstuffworks.com/>

Centre for Industrial Design: http://www.cfid.co.uk/portfolio/portfolio_frameset.html

International Council of Societies of Industrial Design ICSID: <http://www.icsid.org/>

KDA Industrial Consultants: <http://www.designkda.com/high/index.html>

Teams Design: <http://www.teamsdesign.com/>

Creative Design UK: <http://www.creative-design.co.uk/>

Great Buildings: <http://www.greatbuildings.com/>

**Tentative Schedule
Monday 4pm-7pm**

TECH 280 Design in Technology Education

Spring 2010

RV = Rapid Viz

DPST = Design & Problem Solving in Technology

Note: that there will be required sketching activities and projects which will be given as well as reading assignments. If you need to download handouts/activities sheets from class please go to: <http://tech202.wikispaces.com>

January:

25th Syllabus / information / introduction / Background

February:

| | | |
|------------------------|---|---|
| 1st | The Technological Age | DPST pp. 1 - 17 |
| | Problem Solving and Design Processes | DPST pp. 18 – 28 |
| | | RV pp. 2-15 |
| 8th | Problems and opportunities | DPST pp. 29-46 |
| | Problems and opportunities (Breaking down a Design Brief) | RV pp. 46-48 |
| | | Additional Handouts & Examples |
| 15th | Sketching/rendering | RV pp. 50-74 |
| 22nd | Documenting your work | DPST pp. 48-90 |
| | Prototyping | DPST pp. 237-279 |
| March: | | |
| 1st | Rapid indication | RV pp. 78-100 |
| | Visualization | RV pp. 100-115 |
| 8th | Midterm Exam | |
| 15th | Spring Break | |
| 22nd | Presentation on Solid Modeling (at Winman Jr. High in Warwick) | |
| | Investigation & Research | DPST pp. 91-109 |
| | Graphic creation | RV pp. 116 -121 |

| | | | |
|------------------------|---|-------------|----------------------|
| 29th | Presentation on Solid Modeling (at Winman Jr. High in Warwick) | | |
| | Structural systems | DPST | pp. 110 - 136 |
| April: | | | |
| 5th | Learning with Visuals | RV | pp. 132 - 148 |
| 12th | Physical models | DPST | pp. 237 - 279 |
| 19th | Creative thinking & development | DPST | pp. 205 - 236 |
| 26th | Mechanical systems | DPST | pp. 137-166 |
| | Electronic Systems | DPST | pp. 166 - 188 |
| May: | | | |
| 3rd | Pneumatic Systems | DPST | pp. 190 - 203 |
| | Materials | DPST | pp. 237 -279 |
| 10th | EXAM REVIEW | | |