UNIVERSITY OF MARYLAND

Learning Environments for the 21st Century: Students, Learning, and Technology

Young Scholars Program 2003

EDUC 289A

The University of Maryland, College Park
College of Education
Outreach Programs

Educational Technology Outreach

How this course meets the ISTE/NETS*S Foundations for Students

Course Title: Learning Environments for the 21st Century: Students, Learning, and Technology

Completion of any course does not certify competency in the identified area: however, it will contribute to development of the competency

I. Basic operations and concepts

Students:

A. demonstrate a sound understanding of the nature and operation of technology systems.	yes
B. are proficient in the use of technology.	yes

II. Social, ethical, and human issues

Students:

A. understand the ethical, cultural, and societal issues related to technology.	yes
B. practice responsible use of technology systems, information, and software.	yes
C. develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.	yes

III. Technology productivity tools

Students:

A. use technology tools to enhance learning, increase productivity, and promote creativity.	yes
B. use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.	yes

IV. Technology communications tools

Students:

A. use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.	yes
B. use a variety of media and formats to communicate information and ideas effectively to multiple audiences.	yes

V. Technology research tools

Students:

A. use technology to locate, evaluate, and collect information from a variety of sources.	yes
B. use technology tools to process data and report results.	yes
C. evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.	yes

VI Technology problem-solving and decision-making tools

Students:

A. use technology resources for solving problems and making informed decisions.	yes
B. employ technology in the development of strategies for solving problems in the real world.	yes

UNIVERSITY OF MARYLAND

Learning Environments for the 21st Century:

Students, Learning, and Technology

SYLLABUS

Instructor: Davina Pruitt-Mentle
Support: Educational Support Services/Graduate Assistants
Office: 2127 Tawes
Phone: 301 405 8202
email: dp151@umail.umd.edu
Website: www.edtechoutreach.umd.edu

Credits: 3 credit
Time: Three weeks-*Young Scholars Program*

Course Description:
New technology is creating growth and opportunities in fields ranging from teaching to communications, geology to space science, and cryptography to computer forensics. Looking into the future, it is imperative that students are trained in key 21st century skills which will help them play a part in these fields and others, succeed in college, and prepare themselves with the skills necessary to meet the shifting demands of the future workplace.

The rapidly changing workplace is just one reason to consider opportunities in the field of education. A degree in education provides you with a broad range of job opportunities. An undergraduate degree in education is one of the best preparations to enter employment fields which are constantly changing or even some that do not yet exist. Graduates of education live and work throughout the world. You will find teachers and administrators, human resource managers, corporate trainers, continuing educators, technical instructors, computer programmers and trainers, analysts, engineers, entrepreneurs, professors, lawyers, museums curators of education, community outreach directors, and industrial researchers to name just a few.

The 2003 Young Scholars Program, *Students, Learning, and Technology* will allow students to explore and expand their knowledge of essential 21st century skills (technology fluency and applications, team building, collaboration tools, problem based critical thinking), while also exposing them to real-life instances of professionals using these skills in exciting careers that interconnect the fields of education and technology. This course provides a means to explore technology applications essential to college success, as well as opportunities to investigate career possibilities that utilize technology. ***Students, Learning, and Technology*** **will provide three weeks of dynamic and challenging activities through a variety of computer applications and Logo-based computer learning environments – and all while having fun!**

> *The underlying philosophy of Logo links pedagogy to programming in a tight bond. Logo's central theme is that the journey is the reward. The act of creating a program from scratch and debugging it is where the*

*learning takes place. Once a Logo task is complete, the learner has accomplished two things: -not only created a working program, but also, and more important, has developed or refined problem-solving strategies that can be applied to other tasks, whether computer-related or not. (*David Thornberg, *The Philosophy of Logo: the Most Important Attribute)*

Field trips and guest speakers will show how programming and various technology-based applications are used in the modern work environment. Workshops will be hands-on and project-based aimed at learning the thought processes behind solving modern problems. Morning sessions will give students a chance to explore different technology applications (Word, Excel, Access, PowerPoint, Inspiration, Kidspiration, Microsoft Project). Participants will explore, design, build, program, experiment and develop projects using one or more Logo-based computer learning environments (i.e. MicroWorlds™ Terrapin Logo™). Afternoon team activities will focus on designing, building and programming cybernetic devices via the LOGO language and LEGO® Mindstorms™ robotic construction kit. Students need only general computer awareness (basic keyboarding skills). As a culminating activity, student work and reflections will be incorporated into an E-portfolio.

Course Format:

When: The course will meet Monday through Friday from 9:00 AM- 4:00 PM, with a one-hour lunch break. There will also be mid-morning and mid-afternoon breaks.

Where**:** IBM computer Lab, Benjamin Building- College of Education.

What: The format is hands-on and learner-centered designed to foster collaborative research and inquiry. Generally, the morning session will focus on computer/technology applications (web page design, word processing skills, creating games, animated stories, and multimedia presentations). The afternoon team activities will focus on programming concepts utilizing the LOGO language and LEGO® Mindstorms™ robotic construction kit. The culminating activity will be the development of an e-portfolio.

Course Objectives:

Process

Students will:

- focus on inquiry and group based methods of learning;
- collaborate with peers to adapt/redesign problem materials;
- experience problem based learning through active engagement in an appropriate activity;
- know the elements of problem solving, including key content identification, scientific literacy, habits of mind, and critical thinking and learning events involved in project development;
- provide and accept feedback gracefully (to and from other participants and instructors);
- actively participate in all class field trips;
- actively participate in class discussions;
- be a reflective learner.

Product:

Students will:

- explore and use a variety of technology/computer applications;
- use technology to explore and design multimedia presentations;
- design Logo environments (games, animated stories, and interactive multimedia presentations;
- build and program cybernetic devices to perform a specific task;
- keep a journal of reflections and experiences;
- design and present an e-portfolio highlighting projects and experiences.

Readings: Course Packet.
Other readings can be viewed/downloaded from the WebCT & ETO course sites
(www.edtechoutreach.com.umd.edu & WebCT)

Course Expectations and Procedures:

1. It is assumed that all students will participate in class sessions (face-to-face and virtual, as well as all field trips), as discussions and shared experiences are key components of this course.

2. All students will complete assignments in a timely fashion, contribute substantively to class discussions, and as appropriate, prepare critiques of research, readings, and class efforts.

3. All students will present themselves professionally during class times, with guest speakers and while attending field trips.

4. The University of Maryland has a tradition of honor in conduct and academic endeavors among its students. Information regarding the Honor Code and expectations of students may be found at: http://www.inform.umd.edu/CampusInfo/Departments/JPO/code_acinteg.html

5. Participation in all class discussions is required, expected and necessary. The grading rubric for the course is based on expectations of quality, timeliness and participation.

6. **If you have a documented disability and wish to discuss academic accommodations please contact me as soon as possible**.

7. Students missing the deadline for an assignment must make immediate arrangements with the instructor to fulfill that requirement before the next class session.

8. Please carefully edit all written assignments. For more information, see Writing and Editing Hints - http://curry.edschool.virginia.edu/class/edis/771ce/lynch003/edit.html.

9. The citation style, when needed, should be accurate, acceptable, and recognizable practice (MLA, Chicago or APA). The American Psychological Association (APA) style of citation and referencing is preferred. For quick basics, visit:
   a. Columbia University Press - http://www.columbia.edu/cu/cup/cgos/idx_basic.html
   b. Columbia Guide to Online Style/ACW style "help sheets"- http://www.cas.usf.edu/english/walker/mla.html

Grading Policy: Grades will be based on the completion of course requirements and on the scope, quality and creativity of the papers/projects. The extent and quality of participation in course interactions (face to face and virtual) will also be factored into determining the final course grade.

25% Preparation and participation in discussions (face to face and on-line), activities and field trips.
35% Class assignments
40% Product Based Team Activity and individual e-portfolio

The evaluation criteria for this course are described in more detail in the grading rubric which will be presented and discussed in class.

Tentative Course Outline/Schedule

	Week 1	Week 2	Week 3
Monday	**Session 1:** **AM** ▪ Welcome & Logistics ▪ Overview ▪ Introduction to MicroWorlds™ for multimedia creation **PM** ▪ Skill Development with MicroWorlds™	**Session 6:** **AM** ▪ Introduction to Logo based-Terrapin Logo™ ▪ Project Development **PM** ▪ LEGO® Mindstorms™ Team Project Development	**Session 11:** **AM** ▪ 21st Century Skills ▪ Stimulus Materials for e-portfolio ▪ Project Development **PM** ▪ LEGO® Mindstorms™ Team Project Development
Tuesday	**Session 2:** **AM** ▪ Logo Skills Continued **PM** ▪ Thinking about our final projects	**Session 7:** **AM** ▪ Applied Physics Lab Field Trip **PM** ▪ National Cryptologic Museum Field Trip	**Session 12:** **AM** ▪ NIST Field Trip **PM** ▪ 21st Century Skills ▪ Stimulus Materials for e-portfolio ▪ Project Development
Wednesday	**Session 3:** **AM** ▪ **NASA Goddard Field Trip** **PM** ▪ Project Development	**Session 8:** **AM** ▪ 21st Century Skills ▪ Stimulus Materials for e-portfolio - Adding video - Adding field trip pictures and reflections ▪ Project Development **PM** ▪ LEGO® Mindstorms™ Team Project Development	**Session 13:** **AM** ▪ 21st Century Skills ▪ Stimulus Materials for e-portfolio ▪ Project Development/Trial Presentations **PM** ▪ LEGO® Mindstorms™ Team Project Development ▪ Team Project Trial Presentations
Thursday	**Session 4:** **AM** ▪ 21st Century Skills ▪ Stimulus Materials for e-portfolio ▪ Project Development **PM** ▪ Introduction to LEGO® Mindstorms™	**Session 9:** **AM** ▪ **Campus Lab Visits** **PM** ▪ LEGO® Mindstorms™ Team Project Development	**Session 14:** **AM** ▪ Lab Time **PM** ▪ Lab Time ▪ Poster Session Preparation ▪ Post Assessment
Friday	**Session 5:** **AM** ▪ **Campus Lab Visits** **PM** ▪ LEGO® Mindstorms™ Team Project Development	**Session 10:** **AM** ▪ 21st Century Skills ▪ Stimulus Materials for e-portfolio ▪ Project Development **PM** ▪ LEGO® Mindstorms™ Team Project Development	**Session 15:** **AM** ▪ Lab Time ▪ Preparation ▪ Set Up ▪ **Lunch for participants & guests** **PM** ▪ **Presentation of Projects** ▪ **Conclusion**

Tentative Course Outline/Schedule Expanded

Week 1

Session 1 – Monday	**Welcome and Logistics** **An Introduction MicroWorlds™** **Skills Development with MicroWorlds™**
Morning	• Introduction to the course • Reviewing the class format/procedures • Review of scope and sequence of course outline (PowerPoint Presentation) • Review resources and tools that will be used for the course • Using WebCT • Pre-assessment survey (on-line WebCT) • Introduction to Logo language and MicroWorlds™ for multimedia development • Introductory Activity- *An Animated Story*
Afternoon	• Introductory Activity peer and instructor review & critique • HTML Basics – HTML interactive pre-assessment "quiz" – Building a basic web page with Logo based MicroWorlds™ • Process & Development (Brainstorming/Group work) • Project Vignette (Group Activity) • Project Development Time • Debriefing and wrap up • Reflective Journal Entry • Homework Readings: • Asynchronous Postings: – Introductions

Session 2 – Tuesday **Logo Skills Session Continued**

Morning

- Reading Discussion
- Logo instructions and mini projects (games and mazes)
  - using the command center; paying attention to error messages
  - On-line help
  - Using the drawing tools
  - Making music and working with sound
  - Working with text
  - Programming turtles and colors; understanding parallel processes
  - Writing procedures; the special word "to"
- Activity - (creating a game)
- Activity - (creating a maze)

Afternoon **Thinking about our final product**

- What and why to e-portfolios
- Career Resources- Office of Student Services: Career Services
- Productivity Tools
  - Resume activity
  - Word document templates activity
  - Tables/standards activity
  - Digital Camera
- Mini activities
- Project Work Time
- Debriefing and wrap up
- Reflective Journal Entry
- Homework readings:
- Activity – add picture to introductions
- Asynchronous Postings:
  - Reading Reflection
- Storyboard e-portfolio discussion/peer critique

Session 3 – Wednesday	**NASA Field Trip** **Project Development**
Morning	• **Field Trip to NASA/Goddard**
Afternoon	• Trip Debriefing • Storyboard e-portfolio discussion and debriefing • Continue Project Development • Debriefing and wrap up • Reflective Journal Entry • Homework Reading • Asynchronous Postings: – Reading Reflection – Reading Reflection

Session 4 – Thursday	**21st Century Skills** **Stimulus Material for e-portfolios** **LEGO® Mindstorms™ Robotic construction kit**
Morning	• Reading Discussion • Continue with e-portfolio development • Activities: – Digital Camera/video – Scanning – Digital Pictures/image activity – Flyers, brochures, cards – Business cards, envelopes & labels • Project Work Time
Afternoon	• Introduction to LEGO® Mindstorms™ robotic construction kit • Project Development (Team Activities) • Debriefing and wrap up • Reflective Journal Entry • Homework Reading: • Asynchronous Postings: – Reading Reflection – Continue project development with groups

Session 5 – Friday	**Education Connections** **LEGO® Mindstorms™ Team Project Development**
Morning	• **Education Connections- Guest Speaker** – **Dr. John Splaine (http://www.education.umd.edu/EDPL/faculty/splaine.htm)** – Dr. Splaine interests include the effects of television on young people, the use of media in teaching, politics and policy development relative to educational technology, and humanistic aspects of educational media.
Afternoon	• Discussion of Readings • Debriefing of Guest Speaker • LEGO®Mindstroms™ – Exploring kit – Exploring Software • Continue Team Project-robotics • Debriefing and wrap up • Reflective Journal Entry

Week 2

Session 6 – Monday	**Introduction to Logo based-Terrapin Logo™** **Stimulus Material for e-portfolios** **LEGO® Mindstorms™ Team Project Development**
Morning	• Introduction to Logo based-Terrapin Logo™ • Mini Activities • Discussion of differences between the 2 programs
Afternoon	• LEGO® Mindstorms™ Team Project Development • Team Project update – Peer Review – Modifications • Presentations • Debriefing and wrap up • Reflective Journal Entry • Homework Reading • Asynchronous Postings: – Reading Reflection – Reading Reflection

Session 7 – Tuesday	**Field Trip**
Morning	• **Applied Physics Lab Field Trip**
Afternoon	• **National Cryptologic Museum Field Trip** • Reflective Journal Entry • Asynchronous Postings: – Field Trip Reflection – Field Trip Reflection

Session 8 – Wednesday	**21st Century Skills** **Education Connections- Guest Speaker** **Stimulus Material for e-portfolios** **LEGO® Mindstorms™ Team Project Development**
Morning	• Debriefing of Field Trip • Discussion of reading • Education Connections- guest speaker- TBA • Continue Project Development – Adding video – Adding Field Trip Pictures • Mini Activities
Afternoon	• LEGO® Mindstorms™ Team Project Development – Movements – Sensors – Mini Activity • Debriefing and wrap up • Reflective Journal Entry • Homework Reading • Asynchronous Postings: – Reading Reflection – Reading Reflection

Session 9 – Thursday	**Campus Lab Visits** **21st Century Skills** **Stimulus Material for e-portfolios**
Morning	• **Campus Lab Visits**
Afternoon	• Discussion of Readings • Debriefing of Site Visits • Continue LEGO® Mindstorms™ Team Project Development • Debriefing and wrap up • Reflective Journal Entry • Homework Reading • Asynchronous Postings: – Reading Reflection – Reading Reflection

Session 10 – Friday	**21st Century Skills** **Stimulus Material for e-portfolios** **LEGO® Mindstorms™ Team Project Development**
Morning	• Discussion of Readings • Project Development/Presentation – Peer Critique – Modifications Made
Afternoon	• LEGO® Mindstorms™ Team Project Development – Mini Activity • Debriefing and wrap up • Reflective Journal Entry

Week 3

Session 11 – Monday	**21st Century Skills** **Education Connections-Guest Speaker** **Stimulus Material for e-portfolios** **LEGO® Mindstorms™ Team Project Development**
Morning	• Education Connections- Guest Speaker-TBA • Project Development
Afternoon	• **LEGO® Mindstorms™** Team Project Development – Final Project Challenge • Debriefing and wrap up • Reflective Journal Entry • Homework Reading • Asynchronous Postings: – Reading Reflection – Reading Reflection

Session 12 – Tuesday	**Field Trip** **21st Century Skills** **Stimulus Material for e-portfolios**
Morning	• **NIST** – **Computer Forensic Lab**
Afternoon	• Field Trip Debriefing • Continue Project Development • Debriefing and wrap up • Reflective Journal Entry • Homework Reading • Asynchronous Postings: – Reading Reflection – Reading Reflection
Evening	• **Open Lab Time for Project Development**

Session 13 – Wednesday	**21st Century Skills** **Stimulus Material for e-portfolios** **LEGO® Mindstorms™ Team Project Development**
Morning	• Discussion of Reading • Project Development/Presentations – Peer and Guest Review – Modifications
Afternoon	• Team Project Development/Presentations – Peer and Guest Review – Modifications • Debriefing and wrap up • Reflective Journal Entry
Evening	• **Open Lab Time for Project Development**

Session 14 – Thursday	**Lab Time**
Morning	• Continue e-portfolio Project • Continue Team Project
Afternoon	**Lab Time** • Complete e-portfolio projects • Complete Team Projects • Trial Presentations (peers and faculty) • Poster Session Preparation • Post Assessment Survey • Debriefing and wrap up • Reflective Journal Entry

Session 15 – Friday	**Final**
Morning	• Lab Time • Preparation • Set Up
Lunch	**Noon-1:00 PM** **For Participants and Invited Guests**
Afternoon	• Presentation of Projects • Conclusion

References:

Abelson, H., & di Sessa, A.(1981). Turtle geometry. Cambridge, MA: MIT Press.

Arter, J. A. & Spandel, V. (1992). Using portfolios of student work in instruction and assessment. Educational Measurement: Issues and Practice, 11, 36-44.

Association for Computing Machinery http://www.acm.org/ .

Barrett, H. (1996). Technology-supported portfolio assesssment. in R. Fogarty (ed.), Student portfolios: A collection of articles, (pp.127-137). Palatine, Illinois:IRI/Skylight Training & Publishing, Inc.

Braitenberg, V. (1984). Vehicles, Cambridge, MA: MIT Press.

Career info http://www.acinet.org/acinet/.

Resume Information at Job Central: http://jobstar.org/tools/resume/index.cfm.

Christie, A. Electronic portfolio page. http://www.west.asu.edu/achristie/eportfolios/main.html

Fitch, D. (2002). 101 Ideas for Logo. Cambridge, MA: Terrapin Software,

Genres of writing recommended by Purdue Online Writing lab. (2002). Retrieved September 28, 2002 from http://owl.english.purdue.edu/internet/resources/genre.html

Hogg, D. W., Martin, F., and Resnick, M. "Braitenberg Creatures" Retrieved September 28, 2002 from http://fredm.www.media.mit.edu/people/fredm/papers/vehicles/

Ittleson J.(2001, November 4) Building an E-dentity for each student. Educause Quarterly, Retrieved September 28, 2002 from http://www.educause.edu/ir/library/pdf/EQM0147.pdf

Logo Foundation. (1998, Fall) “Programmable brick from LEGO” Logo Update On-line . Retrieved September 27, 2002 from http://el.media.mit.edu/logo-foundation/pubs/logoupdate/v7n1/v7n1-pbrick.html

Mahood J. An introduction to science portfolios Retrieved September 28, 2002 from http://www.accessexcellence.org/21st/TL/mahood_port.html

Martn, F. (Spring 1995). "The art of LEGO design". The Robotics Practitioner: The Journal for Robot Builders, Vol. 1 No. 2, Retrieved September 28, 2002 from ftp://cherupakha.media.mit.edu/pub/people/fredm/artoflego.pdf

Papert, S. (1980). Mindstorms: Children, computers, and powerful ideas. New York: Basic Books.

Sargent, R., et. al. (1995, spring). Building and learning with programmable bricks. Logo Update On-line. Retrieved September 13, 2002 from http://el.media.mit.edu/logo-foundation/pubs/logoupdate/v3n3.html#brick

Tempel, M., & Chafiian, H. (1999, spring/summer).Computer games by kids, for kids. Logo Update On-line. Retrieved September 28, 2002 from http://el.media.mit.edu/logo-foundation/pubs/logoupdate/v7n2/games.html .

Valente, J. (1995, Fall) Logo as a window into the mind. Logo Update On-line. Retrieved September 28, 2002 from http://el.media.mit.edu/logo-foundation/pubs/logoupdate/v4n1.html#window