EDUC 289A:

Students, Learning, and Technology for the 21st Century

Young Scholars Program

Syllabus

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Support: David Wilson (TA) and Educational Support Services
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Website: http://www.edtechoutreach.umd.edu/
Credits: 3 credits
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 and constantly changing 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 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, 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™, LEGO®
Mindstorms™/Roblab™). 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 (basic 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.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.jpo.umd.edu/aca/honorpledge.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:

1. Columbia University Press -  
   http://www.columbia.edu/cu/cup/cgos/idx_basic.html
2. Columbia Guide to Online Style/ACW style "help sheets" -  
   http://www.cas.usf.edu/english/walker/mla.html
3. Purdue Writing OWL center (MLA format)  
   http://owl.english.purdue.edu/handouts/research/r_mla.html   and  
   APA format  
   http://owl.english.purdue.edu/handouts/research/r_apa.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.

**Course Outline**

**EDUC 289A Tentative Course Outline/Schedule**

<table>
<thead>
<tr>
<th>Day</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
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<tbody>
<tr>
<td></td>
<td>Session 1: AM</td>
<td>Session 6: AM</td>
<td>Session 11: AM</td>
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<tr>
<td>Monday</td>
<td>Welcome &amp; Logistics</td>
<td>• Quiz</td>
<td>• Discussion</td>
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<td>• Overview</td>
<td>• Overview of Group Tasks &amp; connection with NASA trip</td>
<td>• 21st Century Skills</td>
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<td>• Introduction to <strong>MicroWorlds™</strong> for multimedia creation</td>
<td>• Discussion</td>
<td>• Stimulus Materials for e-portfolio</td>
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<td></td>
<td>PM</td>
<td>• Project Development</td>
<td>• Project Development</td>
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<td></td>
<td>• Skill Development with <strong>MicroWorlds™</strong></td>
<td>• Introduction to <strong>LEGO® Mindstorms™/Robolab</strong></td>
<td>PM</td>
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<td></td>
<td>PM</td>
<td>• <strong>LEGO® Mindstorms™</strong> Group Activity</td>
<td>Campus Visit - Geography Computer Lab</td>
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<td>• LEGO® <strong>Mindstorms™</strong> Team Project</td>
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<td>Session</td>
<td>AM</td>
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<td>Session 2:</td>
<td>Campus Visit - <strong>Aerospace Engineering</strong>&lt;br&gt;- Discussion: Constructivist Theories &amp; 21st Century Skills&lt;br&gt;- Logo Skills Continued&lt;br&gt;- Animated Story</td>
<td>Mazes&lt;br&gt;Games</td>
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<td>Session 3:</td>
<td>Discussion: Standards&lt;br&gt;- Continue Show and Share/Critique&lt;br&gt;- Adding Audio/Pictures&lt;br&gt;- Mazes and Games</td>
<td>Group Activity (Tasks 1-4)</td>
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<td>Session 4:</td>
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<td>Session 6:</td>
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<td>Session 7:</td>
<td><strong>National Cryptologic Museum Field Trip</strong></td>
<td>Applied Physics Lab Field Trip&lt;br&gt;Project Development</td>
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<td>Session 8:</td>
<td>Trip debriefing&lt;br&gt;- Discussion&lt;br&gt;- Guest Speaker: Andrea Goodwin - Assistant Director for Academic Integrity - <strong>Judicial Programs</strong>&lt;br&gt;- Project Development</td>
<td>Campus Field Trip - Composite Research Lab&lt;br&gt;LEGO® Mindstorms™ Team Project Development</td>
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<td>Session 9:</td>
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<td>Session 12:</td>
<td>Guest Speaker - Anuradha Shenoy - <strong>World Links</strong>&lt;br&gt;- Discussion&lt;br&gt;- 21st Century Skills&lt;br&gt;- Stimulus Materials for e-portfolio&lt;br&gt;- Project Development/Trial Presentations</td>
<td>LEGO® Mindstorms™ Team Project Development&lt;br&gt;LEGO® Mindstorms™ Team Project Development</td>
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<td>Session 13:</td>
<td><strong>National Institute of Standards and Technology (NIST) Field Trip</strong>&lt;br&gt;- Trip Debriefing&lt;br&gt;- Discussion&lt;br&gt;- 21st Century Skills&lt;br&gt;- Project Development</td>
<td>LEGO® Mindstorms™ Team Project Development</td>
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<td>Session 14:</td>
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| PM | • Continue on Group Work  
• If have spare time - continue to work on maze/games/animated story  
• Show and share |
| PM | • 1:00 PM Guest Speaker - Room 0220 - College of Education/Student Services  
• Thinking about our final project  
• Project materials  
• E-portfolio discussion and brainstorming |
| PM | • LEGO® Mindstorms™ Team Project Development |
| PM | • Campus Lab Visits - AnthroTronix & Datastream Conversion Services  
• LEGO® Mindstorms™ Team Project Development |
| PM | • Lab Time  
• Course Evaluation |
| PM | • Post Assessment  
• Team Project Trial Presentations  
• Preparation  
• Set Up |

| Friday | Session 5: AM  
• NASA Goddard Field Trip |
| Friday | PM  
• Trip Debriefing  
• Reading Discussion  
• Project Development |
| Session 10: AM | • Stimulus Materials for e-portfolio  
• Project Development |
| Session 15: AM | • Presentation of Projects  
Lunch (Lunch provided for participants) |
| Session 15: PM | • Continued Presentation of Projects  
• Conclusion |