



Pre-Engineering Newsletter

January 2010

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Open Courseware (OCW)

"Open Courseware (OCW) is a free and open digital publication of high quality university-level educational materials, often including syllabi, lecture notes, assignments and exams. While OCW initiatives typically do not provide a degree, credit, certification, or access to instructors, the materials are made available, for free, under open licenses for use and adaption by educators and learners around the world."

1. MIT

<http://ocw.mit.edu/OcwWeb/web/home/home/index.htm>

MIT has one of the best open ware programs, which offer 1,800 courses in architecture and planning, engineering, health science and technology, humanities, arts and social sciences, management and science. No registration is needed. It was promised that all the courses would be accessible online by 2010.

2. The Open University of London

<http://openlearn.open.ac.uk/> The Open University is

one of the most honorable institutes of UK. The registration is completely free. Topics cover arts and history, business and management, education, health and lifestyle, IT and computing, Law, Mathematics and Statistics, Modern Languages, Science and Nature, Society, Study Skills, Technology. Each topic has its own forum for discussion.

3. Carnegie Mellon University

<http://www.cmu.edu/oli/> Open Learning Initiative at CMU uses intelligent tutoring systems, virtual laboratories, simulations, and frequent opportunities for assessment and feedback, OLI builds courses that are intended to enact instruction. Topics cover biology, chemistry, engineering, logic and proofs, visual communication design and many more.

Dear Kent School student,

- 1) Congratulations to Mr. Austin and to the Kent School Robotics team for been awarded a NASA sponsorship to participate in the 2010 FIRST Robotics Competition! The kickoff is this month, which will once again be carried live on NASA TV. You can watch the satellite broadcast by following information provided at <http://www.nasa.gov/multimedia/nasatv/>. If you do not have access to a suitable satellite downlink feed, the kickoff will also be webcast. Instructions for viewing the webcast has been posted at <http://robotics.nasa.gov/>
- 2) Kent School's own participation in National Lab Day is initiated by the project Promote-Pre-E, which has been added to the National Lab Day Website. Promote-Pre-E is available to view on <http://www.nationallabday.org> at <http://www.nationallabday.org/projects/496-promote-pre-e>

Grand Challenges for Engineering

The National Academy of Engineering (NAE) recently released a list of fourteen "Grand Challenges for Engineering that must be addressed if we hope to achieve a sustainable, economically robust, and politically stable future for our children and our children's children [<http://www.engineeringchallenges.org/>]." These challenges range from the most basic to the extraordinary, and encompass four Grand Challenge themes.

Energy and Environment Computation

- ❖ Make solar energy economical
- ❖ Provide energy from fusion
- ❖ Develop methods for carbon sequestration
- ❖ Manage the nitrogen cycle
- ❖ Provide access to clean water

Security

- ❖ Prevent nuclear terror
- ❖ Secure cyberspace
- ❖ Restore urban infrastructure

Learning and

- ❖ Reverse engineer the brain
- ❖ Enhance virtual reality
- ❖ Advance personalized learning
- ❖ Engineer the tools of scientific discovery

Health

- ❖ Advance health informatics
- ❖ Engineer better medicines

These are ambitious tasks that will require a new generation of engineers that will collectively

- ✓ Create new capabilities
- ✓ Provide pragmatic solutions for basic human needs
- ✓ Develop new entrepreneurial opportunities
- ✓ Reinvent human interactions
- ✓ Transform systems thinking
- ✓ Be the architects of a sustainable society
- ✓ Be mindful of unintended consequences
- ✓ Connect technology with society

4. Tufts University

<http://ocw.tufts.edu/> Courses are categorized by School and the offers are in fields as dental medicine, medicine, nutrition, science and arts. Tufts Open Ware Program is completely free.

5. Stanford University

❖ **Stanford Engineering Everywhere (SEE)** 10 courses, arranged in three subject areas, include one of Stanford's most popular sequences: the three-quarter introduction to computer science. SEE also offers three courses on artificial intelligence and robotics, and four on linear systems and optimization. See <http://see.stanford.edu/default.aspx>

❖ **Open Stanford on iTunes.** The project includes two sites that provide access to a wide range of Stanford courses (publicly accessible and free for everyone) and to learning materials via the iTunes store (restricted site for the Stanford students and community.)

<http://itunes.stanford.edu/>

Other notable universities with free online courses:

6. UMass Boston <http://ocw.umb.edu/>

7. UC Berkeley <http://webcast.berkeley.edu/>

8. UC Irvine <http://ocw.uci.edu/>

9. University of Notre Dame

<http://ocw.nd.edu/>

10. Utah OpenCourseWare Alliance

<http://uocwa.org/>

11. Utah State University <http://ocw.usu.edu/>

12. Yale University <http://oyc.yale.edu/>

Robotics Activity

Season Schedule

1/9/10: Kickoff - game and Kit of Parts released

2/20/10: Suffield HS (FRC176) Shakedown Scrimmage

2/23/10: Ship Date

3/24/10-3/28/10: SPBLI Regional Competition (Hofstra U)

3/24/10: travel down to Hofstra (evening)

3/25/10 8am-8pm: Pits open, practice rounds

3/26/10 8am-8pm: Pits open, qualifying rounds

3/27/10 8am-1pm: Pits open, qualifying rounds, elimination rounds.

Autodesk to support China's engineering education with software and training

Autodesk, a world leader in 2D and 3D design software, will be donating its latest software worth 50 million U.S. dollars to 50 Chinese universities and secondary vocational schools http://news.xinhuanet.com/english/2009-11/17/content_12477960.htm

Innovation Prize Central (IPC)

An extensive listing of innovation awards and prizes, totaling more than \$150 million in prize money, has been deposited in the IPC's website <http://innovationprizecentral.com/>. As of the start of 2010, the listing is

<Boston 100K Artscience Prize> <http://www.artscience100k.org/>, <Boston Innovation Prize>

http://www.barrfoundation.org/about/boston_innovation_prize.html, <CIMIT

Young Clinicians Award> <http://www.cimit.org/grants-youngclinicians.html>,

<Cisco Connected Life Contest>, <Energy Free Home Challenge>, <European Sat Nav Competition>, <Kistler Prize The National Innovation Challenge>, <The PSE Model-Based Innovation Prize>, <Shell Springboard Award>, <Bigelow Aerospace Prize>, <Virgin Earth Challenge>, <The L-Prize_Index Award>, <Lemelson MIT Award>, <Lemelson MIT Prize>, <MIT Clean Energy Prize>, <Satchi & Satchi Innovation Award>, <Gotham Prize>, and <Progressive Automotive X PRIZE>

Essay Competition: DuPont Challenge

"The **DuPont Challenge® Science Essay Competition** invites students, grades 7 - 12, to write a 700- to 1,000-word essay about a scientific discovery, theory, event or technological application. Winners receive savings bonds up to \$5,000 and an expenses paid trip to Walt Disney World and the Kennedy Space Center. The program also rewards the contributions of the winning students' teachers with accompanying trips, \$500 in education grants, and sponsorship to attend the 2011 NSTA National Conference on Science Education in San Francisco. **Submission deadline: January 31, 2010.**"

Students' DNA Project Uncovers Mislabeled Food, Possible New Cockroach Species.

Alan Boyle writes in the msnbc.com (12/29) "Cosmic Log" blog about two students at **Manhattan's Trinity School**, who "did an inventory of the DNA in their own homes" and around the city, and discovered "lots of mislabeled food products, a pesky invasive species...and what appears to be a new breed of cockroach." Among the mislabeled food items were "an expensive brand of sheep's-milk cheese [that] was actually made from cow's milk," and sturgeon caviar that turned out to be Mississippi paddlefish. In all, "eleven of the 66 food items...turned out to be mislabeled." This "reinforced the findings from an earlier Trinity School DNA project" that has become known as "**Sushigate**." The students also discovered, among other things, cockroaches whose DNA barcodes "were 4 percent off from the norm."

Thank you for your time and feel free to contact me if you need more information. Happy New Year!

Sincerely,

Dr. Nadire
Wentz Pre-Engineering Program Director
Kent School