

Science & Engineering Saturday Seminars Spring 2019

- **Designed for STEM teachers; new teachers are especially welcome**
- **Five Saturdays each term; 8:30-1 at UMass Amherst except as noted below**
- **Educational materials, refreshments, parking, PDP's**
- **Advance registration is required; capacity is limited**
- **Early bird cost, up to December 1, \$35 per session, \$140 for all five sessions; after December 1, \$40 per session, \$160 for all 5.**
- **4 PDPs per half day session; option for 3 grad credits at reduced cost with extra work**

January 26. The core of social network modeling: Industrial Engineering. Shannon C. Roberts and Chaitra Gopalappa, Industrial Engineering. Networks are abundant in our everyday lives, from disaster response networks to cellular networks to social networks. In this workshop, we will introduce the different types of networks and how Industrial Engineering is used to model these networks. Next, we will describe current social network modeling research done at UMass. Finally, we will delve into hands-on activities that include social network analysis, such as the clustering of people into groups, and modeling of the spread of ideas in a social network, such as how tweets spread on Twitter.

February 2. Building Solar Cells. D. Venkataraman (DV) Chemistry. Solar cells convert the sun's energy into electrical energy. In this workshop, I will discuss the processes involved in solar cell and various types of solar cells that are being developed as an alternative to silicon solar cells. I will also demonstrate how students can build a solar cell from readily available materials.

February. 9. Polymers All Around Us. Polymer Science Grad Students. ****At Silvio Conte Polymer Research Building A110/111**** This presentation is designed to introduce K-12 students to polymer science with the primary aims of establishing a strong foundation in the physical sciences and inspiring students to pursue degrees and careers in STEM-related fields. Examples of natural polymers (e.g., DNA and RNA) and polymers in common materials (e.g., contact lenses, bulletproof glass, composite airplanes, etc.) are presented to demonstrate their importance to our daily lives. The presentation conveys the interdisciplinary nature of polymer science through hands-on experiments and discussion focused on concepts related to polymer chemistry (i.e., gelation and superabsorbent materials), engineering (i.e., injection molding and 3D printing), and physics (i.e., viscoelasticity and phase transitions). The depth of the presentation is modified to fit students' backgrounds in science to ensure information is efficiently translated at the appropriate grade level. Through the combination of visual presentation and classroom-friendly experiments, students gain an understanding of polymer science and its importance to modern and future technologies

March 2. Supporting Diverse Learners in the Classroom: Bridge the Gap with Assistive Technology. Kelsey Hall, Information Technology. After first issuing 1:1 iPads, Chromebooks and laptops, many k-12 schools are now implementing BYOD (Bring Your Own Device) programs that provide more choice for educators and learners. Some are "Going Google" with Chromebooks and G Suite, while others are using iPads and tablets. How do you support diverse learners on all devices, using free and low cost Apps and Assistive Technology (AT) solutions? These AT (Assistive Technology) solutions (many of which are free or low cost) personalize the educational experience, as well as engage and include ALL learners in a Universally Designed environment across the curriculum. AT has the potential to foster engagement, as well as support access through personalizing learning by providing multiple options for how learners can engage with and produce information. With ever-changing technology and advancements in learning tools, this often leaves educators feeling as though they are underprepared in terms of knowledge and skill regarding the most effective way to support all students, including those with disabilities. These AT

solutions are being utilized in K-12 schools, colleges, as well as the workplace environment and support successful transition to post-secondary options. This informative and engaging session features hands-on demonstrations and activities for participants interested in building the bridge to learning through technology. Bring Your Technology to follow along hands-on during engaging demonstrations and activities! Extra devices and technologies will also be provided for group activities. You will actively be engaged during this UDL and multi-sensory workshop, as your learners will be in the classroom!

March 23. Accessible Science: The Natural History of the Connecticut River Valley. Fred Venne. ****At Amherst College Beneski Museum****. Many students take an Earth science or geology course to fulfill a requirement, knowing little to nothing about the field. Like all sciences, geology can appear to have ready answers unconnected to other areas of human endeavor, such as art, religion or philosophy. An interdisciplinary approach to teaching can ameliorate this perception for students who are intimidated by the subject and deepen understanding for those who are already excited about geology. We will examine two strategies designed to support the nature of science while scaffolding student learning in geology: research based digital resources use and museum of natural history visits. One strategy is the effective use of research-based transdisciplinary digital resources. We will use recently developed website resources with a local focus to show how science integrated with history and art can deepen classroom and field trip experiences. The resources integrate historical and cultural resources with modern understandings of geology, drawing upon local libraries, historical societies, archives, municipal and state record offices, and the insights of working geologists and educators. The second strategy is the successful use of Natural History museum assets. The Beneski Museum of Natural History will serve as a backdrop for participants taking a team deep-dive into the local geology of Western Massachusetts using museum linked peer reviewed field guides.

April 6. Weather cancellation makeup date.

May 4. Recall for those registered for graduate credit. Hasbrouck Lab.

Graduate credit option: There is a charge of \$300 for 3 graduate credits plus a \$47 registration fee; register for Nat Sci 697A (Cont & Prof. Ed) or 697 F (University). This is in addition to the \$140 or \$160 STEM Education Institute fee. Teachers may obtain credit for the seminar as many terms as they wish, but only 3 credits may be applied to UMass Amherst degrees. **Registration online for graduate credit is done only online. See <http://www.umasslearn.net/registration-info>.** A lesson plan and a book report will be required for those enrolled for graduate credit.

Questions: Mort Sternheim, mmsternheim@gmail.com

Click [here](#) to register.