Working Group A: Foundational Science Courses

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1. How might the College do a better job of understanding and meeting the different needs and expectations of other Purdue colleges whose students take foundational Science courses?
   i. Demonstrate strong College of Science support for academic preview sessions in BGR by encouraging faculty who coordinate and or teach key Foundational Science Courses to work with Dan Carpenter to ensure that the “Academic Preview” talks related to these courses be given during Boiler Gold Rush. Courses include: CHM 111, 115, 12901; STAT ABC; PHYS 172 (others?); BIOL (which ones?); MA (which ones? 16010, 16020, 161, 162, 165, 166, the 150s?)
   ii. Encourage faculty to discuss with other colleges the curriculum and pedagogical approaches used in Foundational Science Courses.
      a. For example, Drs. Towns and Harwood from chemistry have had constructive conversations with the College of Agriculture’s Curriculum and Student Relations Committee (CSRC) and with the College of Health and Human Sciences about the revising the curriculum in chemistry 111 and 112.
      b. Currently there is a Foundational Course committee convened by Mike Harris, Associate Dean of Engineering for Undergraduate Education and Engagement, and Beth Holloway, Assistant Dean of Engineering for Undergraduate Education, that includes the head of each undergraduate engineering program and representatives from chemistry (Towns), physics (Hirsch), Math (Jim McClure), and Biology (Jeff Lucas???).
      c. How can we get other departments/programs/areas to meet with us and how should this activity be monitored and by whom?
      d. Evaluate the learning goals with reference towards the student audience and needs. What should be taught and what should be removed from the curriculum? (See: http://www.sciencedaily.com/releases/2015/10/151015144814.htm )
   iii. Initiate ongoing discussions with engineering about load balancing CHM 115 and PHYS 172. Andy suggested meeting with Mike Harris soon!
   iv. Student learning and authentic assessment take priority over efficiency and cost-saving. The math department's use of LON-CAPA is especially problematic for the students.
   v. Students should be able to easily determine their grades during the semester in foundational courses. All 100/200 level courses are required to provide students with mid-term grades via Blackboard or through MyPurdue as approved by the faculty senate. The college should monitor which courses are meeting this requirement as this is especially important information for advisors and students.
   vi. Clearly stated grading criteria and gradelines should be required in course syllabi.
vii. Multiple coordinated sections of courses should use the same grading criteria and same examinations that align well with learning objectives so that students and advisors can easily determine course grades. There seems to be a great deal of dissatisfaction with current practices in mathematics.

viii. Interfacing with Indiana high schools in different ways such as a Purdue staff member visiting high schools to help students understand the expectations of Purdue University with regard to academics.

ix. Support initiatives to help students learn study skills and time management. Reading a science or mathematics textbook (or materials) requires a different approach than reading literature or a blog. Additionally research demonstrates that students over estimate their learning from watching videos and other media. How can we use this research to improve student learning?

2. What is the appropriate mix of on-line, traditional, and mixed format courses offerings?

i. Online courses should be instructor-led initiatives with faculty involvement throughout.
   a. Online courses should not be viewed as deliverables that can be transferred to a person who can teach the course for less money.

ii. There are no ideal numbers of traditional/online/flipped courses. The choice needs to be instructor driven and the instructors need to be given plenty of support and training (IMPACT for example).

iii. Could the format and expectations of a course be provided in the notes feature of MyPurdue? This would allow advisors the opportunity to talk with students about the different formats and which format might best fit the student.

3. What supports exist to innovation in conceiving or delivering foundational Science instruction, and how might the supports be strengthened and leveraged?

i. Continue to support faculty engagement in IMPACT.

ii. Encourage faculty to partner with ITaP to use emerging products such as Passport and HotSeat in new ways to support and or assess student learning.

4. What barriers exist to innovation in conceiving or delivering foundational Science instruction, and how might the barriers be lowered?

i. To encourage curriculum revision encourage faculty teaching foundational courses to carefully consider what is taught and why. Michigan State has embarked on these conversations see [http://www.sciencedaily.com/releases/2015/10/151015144814.htm](http://www.sciencedaily.com/releases/2015/10/151015144814.htm)

ii. A lack of resources to support high quality instructional innovations such as peer leaders, learning assistants, staff to support laboratories (scientists to prepare them and storekeepers to manage the flow of materials), and materials. Foundational courses need a laboratory fee per student to support these resources.

5. Do the foundational courses adequately serve the needs of under-represented minority, first-generation, and underserved students beginner and sophomore students?
1) Implement programs to improve study skills and time management. Andy mentioned that Penn State as a 4-week summer training session for at-risk incoming students (but open to others) to work on improving these skills.

2) Statistics of the DFW rates of URM students and discussions on the possible factors.