NANOTECHNOLOGY CONCENTRATION

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Nanotechnology is the process of engineering at the molecular scale to create new properties that have the potential to impact every sector of our economy, from health and medicine to energy. The field plays a critical role in biology, chemistry, engineering, medicine, and physics – from building microprocessors and delivering anti-cancer drugs efficiently to making clothes more stain resistant and improving sunscreen absorption. The 15 hour Nanotechnology Concentration provides students with hands-on experience with atomic and electron microscopes, nanoanalysis tools, and fluorescent scopes that enhance 3-D imaging. To fulfill concentration requirements, students must complete a minimum of 15 credit hours of courses in biology, chemistry, earth science and physics to learn about the application of nanoscience in manufacturing, pharmaceuticals, agriculture, and industrial research and development.

Nanotechnology Concentration Requirement

Select a minimum of 15 credit hours from the following:

- BIO 121 General College Biology I, 4 credit hours
- BIO 251 Microbiology, 4 credit hours
- CHM 221 Organic Chemistry I, 4 credit hours
  - or CHM 223 Organic Chemistry I, 5 credit hours
  - or CHM 227 Organic Chemistry I Laboratory, 2 credit hours
- CHM 222 Organic Chemistry II, 4 credit hours
  - or CHM 224 Organic Chemistry II, 5 credit hours
  - or CHM 228 Organic Chemistry II Laboratory, 2 credit hours
- EAS 121 Physical Geography, 3 credit hours
- PHY 140 Fundamentals of Nanotechnology I, 4 credit hours
- PHY 141 Fundamentals of Nanotechnology II, 4 credit hours
- PHY 222 General Physics II, 5 credit hours
- PHY 223 Modern Physics, 4 credit hours

Students meeting the requirements for the concentration will have a notation added to their transcript indicating successful completion. In order to receive this notation, students must complete a Nanotechnology Concentration Completion Form and meet with the Program Coordinator.

Concentration Learning Outcomes

1. Work effectively in teams of various sizes.
2. Summarize information through written or oral communication.
3. Describe the nanoscale by various methods such as analogy, mathematical expression (decimal or exponential) and by sizes of representative materials and systems.
4. Describe the relative importance of properties, interactions and forces at the macro, micro and nanoscale.
5. Use scientific notation to represent large and small numeric values.
6. Analyze data gathered during experimental methods using descriptive statistical metrics such as mean and standard deviation or variance.
7. Describe interactions, causes, and constraints between biological and non-biological systems (hydrophilic/hydrophobic, tension, adhesion etc.)
8. Describe atomic structure and bonding and outline their importance at the nanoscale.