Part 1: Research/Design Ethics and Intellectual Property

*"**Research ethics** involves the application of fundamental ethical principles to a variety of topics involving scientific research. These include the **design** and implementation of research involving human experimentation, animal experimentation, various aspects of academic scandal, including scientific misconduct (such as fraud, fabrication of data and plagiarism), whistleblowing; regulation of research, etc.*

The scientific research enterprise is built on a foundation of trust. Scientists trust that the results reported by others are valid. Society trusts that the results of research reflect an honest attempt by scientists to describe the world accurately and without bias. But this trust will endure only if the scientific community devotes itself to exemplifying and transmitting the values associated with ethical scientific conduct."

http://en.wikipedia.org/wiki/Research_ethics

See Also: Engineering Code of Ethics
http://www.nspe.org/Ethics/CodeofEthics/index.html

*"**Intellectual property** (**IP**) is a legal concept which refers to creation of the mind for which exclusive rights are recognized. Under intellectual property law, owners are granted certain exclusive rights to a variety of intangible assets, such as musical, literary, and artistic works; discoveries and inventions; and words, phrases, symbols, and designs. Common types of intellectual property rights include **copyright, trademarks, patents,** industrial design rights, trade dress, and in some jurisdictions **trade secrets**."*

http://en.wikipedia.org/wiki/Intellectual_property

Copyright: *the exclusive legal right, given to an originator or an assignee to print, publish, perform, film, or record literary, artistic, or musical material, and to authorize others to do the same.*

Trademark: *something (such as a word) that identifies a particular company's product and cannot be used by another company without permission.*

Patent: *making exclusive or proprietary claims or pretensions.*

Trade Secret: *something (such as a special way of doing or making something) that is known only by the company that uses it and is protected from competitors*

http://www.merriam-webster.com

Examples of Intellectual Property

Copyright: *music (Taylor Swift), books (Callister)*

Trademark:

Patent:

MISALIGNMENT CORRECTION FOR EMBEDDED MICROELECTRONIC DIE APPLICATIONS

Publication number: 20130119046

Abstract: The present disclosure relates to the field of integrated circuit packaging and, more particularly, to packages using embedded microelectronic die applications, such a bumpless build-up layer (BBUL) designs. Embodiments of the present description relate to the field of alignment correction of microelectronic dice within the bumpless build-up layer packages. This alignment correction may comprise characterizing the misalignment of each microelectronic die mounted on a carrier and forwarding this characterization, along with data regarding the orientation of the carrier, to processing equipment that can compensate for the misalignment of each microelectronic die.

Type: Application

Filed: January 10, 2013

Publication date: May 16, 2013

Inventors: Grant A. Crawford, Islam Salama

Trade Secret: *Coca Cola ingredients*

Part 2: Entrepreneurship

Entrepreneur: a person who starts a business and is willing to risk loss in order to make money *http://www.merriam-webster.com*

Common Components for Successful Entrepreneurship

- Willing to take a risk and accept failure
- Have a passion for your company's success
- Have a mentor whom you can trust and will give you honest advice
- Unique intellectual property
  - -Non Disclosure Agreement
  - -Material Transfer Agreement
  - -IP Protection, see: USPTO: http://www.uspto.gov/
- Willingness to collaborate
- Understanding market needs and marketing
- Understanding of finances
- Be an effective communicator

Getting Started/Opportunities

- Form a Limited Liability Corporation (LLC), http://sdsos.gov
- Visit Rapid City Economic Development Incubator (on campus, top of hill behind O'Harra Stadium)
- Governor's Giant Vision Awards, http://www.southdakotagiantvision.com/student/ (April annually)
- National Collegiate Student Prize Competition, http://web.mit.edu/invent/a-student.html
- Engineers Make Great Entrepreneurs, SD Mines competition (Sept)
- Funding
  - -Friends and family
  - -Sweat equity
  - -Traditional sources (banks)
  - -Tech-based government funding, see: http://www.sbir.gov/
  - -SD Governor's Office of Economic Development: http://www.sdreadytowork.com/Public-Records/Proof-of-Concept-Fund.aspx

Part 3: In-Class Activity

A. ***Individual Activity:*** *Take a few minutes and write down a concept you have for a new product that you might consider for commercialization.*

B. ***Group Activity:*** *Review each of your new product ideas and rank them from top (best) to bottom.*

C. ***Group Activity:*** *Take a few minutes with your design group and brainstorm whether or not there is potential intellectual property associated with your design project.*

D. ***Report Out:*** *Identify a design group spokesperson to identify for the class the top idea determined in Part B above and the potential IP from Part C above.*