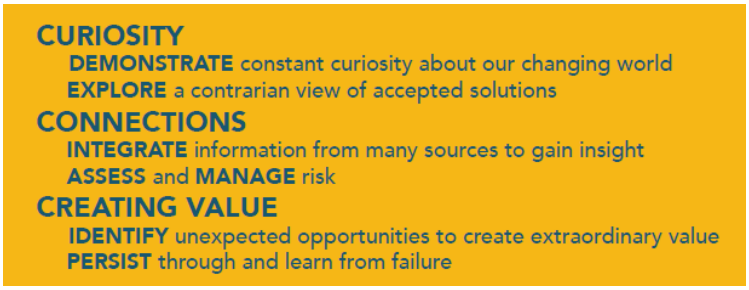
Example Activities to Promote Development of the Entrepreneurial Mindset in Engineering Courses



1. Assign or have students select an innovation connected to your course content, search online for similar products and develop a list of competitors. Next, have students describe the landscape of competition for their innovation:

- Are there a lot of competitors providing similar products or services?
- Are there any large competitors likely dominating the market share?
- How entrenched are the competitors? Are the competitors startups or long-standing companies?

Finally, have students write a short description of how the innovation the selected or were assigned provides something different than its competitors.

2. Assign or have students select an innovation related to your course content, search for information about its potential competitors online and provide an analysis that describes:

- the customer segments of their assigned/selected innovation
- if potential customers of their assigned/selected innovation are limited by location or resources
- if potential customers of their assigned/selected innovation are dependent on or tied to similar products they'd be reluctant to or find difficult to switch from using
- their informed estimate of the growth potential for their assigned/selected innovation

3. Assign or have students select an innovation related to your course content, search for information about its potential competitors online and provide an analysis that describes their distribution channels:

- Do they all use the same/similar distribution channels? Describe the similarities and differences.
- Are the distribution channels fast, efficient and reliable? Do you see one of these factors being sacrificed or given priority in favor of another? If so, what might be the reason for this?
- Do you think it is appropriate for your innovation to use the same distribution channels? Why or why not? What alternatives might be possible? What are the pros and cons of your innovation being distributed via the same or different channels than its potential competitors?

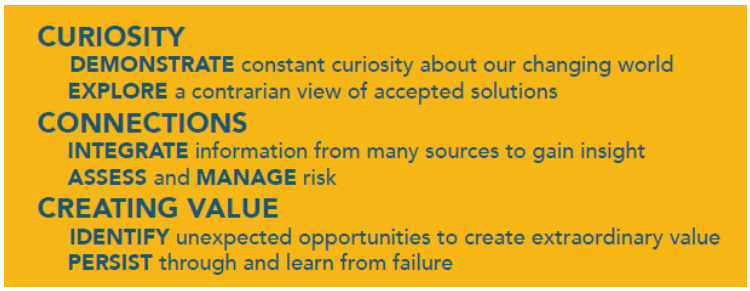
4. Assign or have students select an innovation related to your course content, develop a list of characteristics of who might purchase it: their demographics, their likely resources, how frequently they might purchase the product, the kind of customer support they might need, etc.), and develop a "customer relationship analysis" that describes:

- How they might attract new customers
    - Wil it take a lot of work?
    - Is there a big pool of potential customers or is it limited?
- How much customer contact might be neccessary
    - Will customers purchase it frequently or be "one and done"?
    - Will customers need a lot of support and/or service?
- How aware of "brand reputation" will your customers be
    - Will customers instantly connect the innovation to a brand name?
    - Will customers' decision(s) to purchase or repurchase your innovation be related to brand recognition?

Based on their analysis, have students describe the relationship between their assigned/selected innovation and its customers, including whether it might be a high or low cost relationship, a fleeting or intensive relationship, a relationship based on just the product purchase or that includes additional support/services, etc. Finally, have students estimate whether customer relationships will play a large or small role in the financial modeling for this innovation.

5. Assign or have students select an innovation related to your course content, have them consider "key activities" by reviewing the list of "Typical Activities" at https://www.cleverism.com/key-activities-block-business-model-canvas/ , and then rate each of those activities for their assigned or selected innovation on a scale of 1-10 (1=not very important and/or intensive, 10=very important and/or intensive). Finally, have students analyze their ratings and develop a projection for the key activities they might have to pay the most attention to in financial planning for their innovation.

Example Discussion Prompts to Promote Development of the Entrepreneurial Mindset in Engineering Course Online Discussions



	Introduction to Engineering	Computer Integrated Manufacturing	Engineering Statistics
John Peterson – What are the basics of the business model? What makes a high performance business model? How do you test your business model?	Curiosity: In talking with potential customers about your design project, what questions would you ask to validate the value proposition? What other solutions are currently available? Identify 3 advantages and 3 disadvantages for a customer to switch over to your new product. Connections: What potential roles can engineers play in the business model process? Creating Value: Select an engineering design firm and identify their value proposition and customer segments. (This part could require going on a field trip and/or interviewing an engineer at a design firm.)	Curiosity: What role does technology and automation play within a company's business model? Connections: Lean manufacturing promotes eliminating wastes in the manufacturing process. Select a company (e.g. Amazon, Walmart) and identify 3 ways in which they apply the lean philosophy within their Business Model. Creating Value: Select a manufacturing company and identify their value proposition and customer segments. (This part could require going on a field trip and/or interviewing an engineer at a manufacturing company.)	Curiosity: How can statistics be used to validate the business model? Connections: Regression analysis can be used to predict sales and demand based off of historical data. What data collection should startup companies be doing early on to assess and manage risk, ultimately predicting the success of the company? Creating Value: Select a company that relies heavily on statistics to assist in maintaining a profit. Identify the role of statistics in their overall value proposition. (Examples might include insurance companies, national laboratories, marketing firms, etc…)