

HIGH SCHOOL CURRICULUM PROPOSAL

PROPOSED COURSE NAME: **Introduction to Engineering**

OLD COURSE NAME (if applicable): **N/A**

SUBMITTED BY: **Chris Shank**

Underline the Appropriate Item: **New Course** / Major revision to an existing course

Implementation Date: **Fall 2020**

Person(s) who will write the Curriculum: **Chris Shank – using a blend of EbD (Engineering by Design) and LocoDrone Voyager**

Respond to the following: **Chris Shank**

Duration: **Full School Year**

Open to: **All Students**

Prerequisites: **Algebra I**

Pass/Fail Option: **No**

Credit:

If the course meets a graduation requirement, which one does meet? **TBD**

Where does this course fit into department sequence? **This course will fit into the science department but is not currently required for graduation.**

What is the potential impact of this course on the other department offerings? **N/A**

Course Description: **Students are introduced to the engineering design process, applying math, science, and engineering standards to identify and design solutions to a variety of real problems. They work both individually and in collaborative teams to develop and document design solutions using engineering notebooks. Students will develop skill in technical representation and documentation of design solutions according to accepted technical standards. Ethical issues related to professional practice and product development are also presented.**

Special Notes (i.e., extended periods, team teaching, etc.): **N/A**

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RATIONALE, OBJECTIVES, STRATEGIES

1. Course Rationale

A) What is the evidence of student need for this course? **This course will help align North Boone to the Next Generation Science Standards (NGSS) and alleviate the lack of exposure to the field of engineering for students at North Boone.**

B) What departmental needs/goals would this course meet? **The Next Generation Science Standards (NGSS) require students to learn the concepts of engineering. This will help to further expose students to those standards.**

C) What institutional needs/goals would this course meet? **Students at North Boone are not currently exposed to the foundations of engineering. This would be a project based introductory engineering class that would expose students to foundations of different areas of engineering such as electrical, mechanical, and civil. This course will engage students who are interested in pursuing an engineering degree and those interested in entering the trades beyond high school.**

2. Course Objectives: What will each student learn and know?

Students are introduced to the engineering design process, applying math, science, and engineering standards to identify and design solutions to a variety of real problems. They work both individually and in collaborative teams to develop and document design solutions using engineering notebooks. Students will develop skill in technical representation and documentation of design solutions according to accepted technical standards.

Ethical issues related to professional practice and product development are also presented.

3. What types of instructional strategies will be used in the class?

Through both individual and collaborative team activities, projects, and problems, students will solve problems as they practice common engineering design and development protocols such as project management and peer review.

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4. What types of student assessment procedures will be used? How will the assessment be used to guide instruction?

Assessment will utilize the activity-project-problem-based (APB) teaching and learning pedagogy. Students will progress from completing structured activities to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills.

5. List resources needed and approximate costs to implement this course. Include staff development, materials, textbooks, additional staff, equipment, technology resources, facilities, and fees.

\$4926.60 – Engineering by Design (EbD) Equipment and Supplies

\$6690 - LocoDrone Voyager Full Class Set (2:1 ratio) for 30 students

- 1. 15 LocoDrones + 30 student licenses * \$425 = \$6375**
- 2. 15 Extra Batteries * \$18/each = \$270**
- 3. 4 LocoDrone repair kits (extra propellers, extra safety frame) * \$30 = \$120**
- 4. Shipping (\$15 ea) * 15 units = \$225**

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