Purdue VIP Senior Design Project Description Report

Last revised 8/16/2022

**Instructions (Delete the pages 1 and 2 prior to submitting the report):**

This form is to be completed for each VIP project on which there are one or more 2nd semester Senior Design students using VIP registration to fulfill the BSCmpE or BSEE senior design requirement. Senior design students on the project should work together to complete this report. If a VIP team has several projects involving senior design students, submit a separate report for each project.

**DEFINITIONS**:

**Engineering Design:** Engineering design is a process of devising a system, component, or process to meet desired needs and specifications within constraints. It is an iterative, creative, decision-making process in which the basic sciences, mathematics, and engineering sciences are applied to convert resources into solutions. Engineering design involves identifying opportunities, developing requirements, performing analysis and synthesis, generating multiple solutions, evaluating solutions

against requirements, considering risks, and making trade- offs, for the purpose of obtaining a high-quality solution under the given circumstances. For illustrative purposes only, examples of possible constraints include accessibility, aesthetics, codes, constructability, cost, ergonomics, extensibility, functionality, interoperability, legal considerations, maintainability, manufacturability, marketability, policy, regulations, schedule, standards, sustainability, or usability.

**Complex Engineering Problems:** Complex engineering problems include one or more of the following characteristics: involving wide-ranging or conflicting technical issues, having no obvious solution, addressing problems not encompassed by current standards and codes, involving diverse groups of stakeholders, including many component parts or sub-problems, involving multiple disciplines, or having significant consequences in a range of contexts.

**Team:** A team consists of more than one person working toward a common goal and should include individuals of diverse backgrounds, skills, or perspectives.

**Engineering Standards:** Engineering standards are documents that define the characteristics of a product, process, or service to meet technical, economic, environmental, and/or societal challenges. (The IEEE is a good source for finding appropriate standards: standards.ieee.org.

**Engineering Judgement:** Engineering judgement is the ability to decide upon the design, operation, applicability, and/or installation of a product based on the use of appropriate scientific/engineering principles, standards, and practices.

**Types of Audiences:** Basic audience types include executives, managers, investors, marketers, peers, subordinates, and the general public. The composition of these audiences can include experts, knowledgeable non-experts, and laypersons. Actual audiences may be very specific or be a mixture of these types and compositions. The nature of any of these audiences can be sympathetic, persuadable, apathetic, critical, hostile, or a combination of these.

**Learning Strategies**: Learning is “the acquisition of knowledge or skills through study, experience, or being taught.” Specific methods to acquire and apply new knowledge include self-study, short courses, professional conferences/forums, review of the professional literature, consultation with experts, etc.

**Informed Judgement**: An informed judgement is based on information, not personal opinion.

**DESIGN CONSIDERATIONS:**

**Public Health, Safety, and Welfare Factors:** The term ‘health’ can be defined as a state of well-being of people in both a physiological and psychological sense. ‘Safety’ can be defined as the absence of hazards and/or physical harm to persons. The term ‘welfare’ relates to the provision of the basic needs of people.

**Cultural Factors:** Culture encompasses the set of beliefs, moral values, traditions, language, and laws (or rules of behavior) held in common by a nation, a community, or other defined group of people.

**Economic Context/Factors** – Relating to the economy (the system of production, distribution, and consumption of goods and services).

**Environmental Context/Factors:** Concerned with the environment as it relates to living organisms and natural resources.

**Societal Context/Social Factors:** Relating to extended social groups having distinctive cultural, social, political, and/or economic organizations.

**Global Context/Factors:** Relating to world-wide contexts and factors, rather than only local ones

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| --- | --- |
| **Course Number and Title** |  |
| **Semester/Year** |  |
| **Instructor(s)/Advisor(s)** |  |
| **VIP Team** |  |
| **Project Title** |  |
| **Senior Design Students:** |
| **Name** | **Major** | **Area of Expertise** | **Expected Grad Date** | **On team****1st sem. of senior design?** | **On team****2nd sem. of senior design?** |
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| **Other Team Members: (Names of all project team members of the project team that have participated during the two semesters of the senior design students’ experience on the team.)** |
| **Name** | **Major** | **Area of Expertise** | **Expected Grad Date** | **On team****1st sem. of senior design?** | **On team****2nd sem. of senior design?** |
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**Project Description**: Provide a brief (one or two page) technical description of the design project as outlined below. Your response to each item should immediately follow the prompt.

(a) Provide a general description of the **product** (any device, system, process, software, etc. resulting from this design experience) to be delivered by this design project.

(b) What is the purpose of this **product**? For whom is it intended?

(c) Describe how the **engineering design process** used to create your product was utilized in this project. Include how you were able to develop and conduct appropriate experiments, analyze, and interpret data, and use **engineering judgment** to draw conclusions related to the development of your product.

(d) Describe the **design constraints**, and resulting **specifications**, incorporated into your product (list a minimum of 3).

(e) Describe how each of the following factors influenced your design **specifications** and **constraints**. (See definitions on first page)

* Public health, safety, and welfare
* Global factors
* Cultural factors
* Social factors
* Environmental factors
* Economic Factors

(f) Describe the appropriate **engineering standards** (see definition on first page) incorporated into the creation of your product.

(g) Describe the **final status** of your product.

(h) Describe the makeup of your project team and how you were organized to establish goals, plan tasks, and meet the objectives of this project.

(i) Did your project require the production of any written documentation other than this document (i.e., manuals, educational materials, etc.)? If so, describe the types, composition, and nature of the audiences (see definition on first page) for whom these materials were intended.

(j) Describe the types, composition, and nature of the audiences in attendance for the final oral design review. Discuss how you prepared for this audience.