Software Requirements Specification

for

UPOD – Physics Research

**Version 0.1**

**Prepared by Anders Lam**

**Wilfrid Laurier University, CP317**

**May 30, 2016**

**Table of Contents**

[1. Introduction 3](#_Toc452502853)

[1.1 Purpose 3](#_Toc452502854)

[1.2 Product Scope 3](#_Toc452502855)

[2. Overall Description 4](#_Toc452502856)

[2.1 Product Perspective 4](#_Toc452502857)

[2.2 Product Functions 4](#_Toc452502858)

[2.3 User Classes and Characteristics 4](#_Toc452502859)

[2.4 Operating Environment 4](#_Toc452502860)

[2.5 Design and Implementation Constraints 4](#_Toc452502861)

[3. External Interface Requirements 5](#_Toc452502862)

[3.1 User Interfaces 5](#_Toc452502863)

[3.2 Hardware Interfaces 5](#_Toc452502864)

[3.3 Software Interfaces 5](#_Toc452502865)

[3.4 Communications Interfaces 5](#_Toc452502866)

[4. System Features 6](#_Toc452502867)

[4.1 Physics Information and Research 6](#_Toc452502868)

[4.2 Animations and MathJax 7](#_Toc452502869)

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| Tom West | 31/05/16 | Aligned Introduction & Formatting | v0.3 |
| Anders Lam | 27/0516 | Updated Product Description section | v0.2 |
| Anders Lam | 24/05/16 | Initial Draft | v0.1 |

# Introduction

## Purpose

This collection of requirement documents outlines the visual and functional design choices made in order to update the Laurier UPOD site. The UPOD site should:

1. Contain all relevant (accurate) information a first year physics undergraduate student would need to access in reference to their courses.
2. Be easy to navigate, as students generally stop looking unless information is easily available
3. Be responsive, as students generally are on tight timelines, and don’t have time for sites to load slowly.

## Product Scope

UPOD (Undergraduate Physics Online Database) is a website designed to the students with information about physics. The goal is to provide accurate and up to date physics knowledge for undergraduate students. There are currently very few quality physics reference sites, so UPOD has the opportunity to fill a large gap facing physics students at present.

# Overall Description

## Product Perspective

Integrating physics research and information into the new UPOD website, which will replace the old one, will be completely new in its design and all the features that the website provides. The new UPOD system will be much more interactive and will contain many of the elements of the old UPOD website, but will be much more user friendly as well as containing much more relevant information to the topics covered.

## Product Functions

The physics research and information provided in the UPOD website must be able to provide useful information sufficient enough for the MathJax, Animations and Front-end team to use to complete their own aspects of the website. The information provided by the Physics team must be insightful and provide useful information that can be used appropriately for animations, equations, and problems relevant to the topic.

## User Classes and Characteristics

Front-end Team will be using this physics research and information that will result in them projecting the information onto the website in the most efficient and user-friendly way possible. The MathJax Team will be using the information to create interesting diagrams and project the equations and formulas from the Physics Team. The Animations Team will work together with the physics information and research given to create unique ways to demonstrate relative physics information.

## Operating Environment

The physics information and research will operate alongside a wide variety of different teams to create a UPOD website that is compatible with all website browsers. The physics information will work closely with MathJax, and Animations as well as the Front-End team.

## Design and Implementation Constraints

Some limitations and constraints that the Physics Team might face is that there is too much physics research and information pertaining to certain topics covered. This might provide constraints as incorporating too much information into the UPOD website might be detrimental to the effectiveness of the website or the usability of the website.

# External Interface Requirements

## User Interfaces

The physics information and research that is provided by the Physics Team will be used in conjunction with the MathJax Team and Animations Team to provide unique and creative ways to help the user learn about the physic concepts. The MathJax Team will use the physics information collected to showcase sample problems and show equations that the user can see and do practice with. The Animations Team will use the physics information provided to provide the UPOD website with unique and interactive diagrams and animations for the user so that they can be involved and understand the material better.

## Hardware Interfaces

The UPOD website will be based on the user being able to have access to the internet and accessing the website to learn more about the information. No specific hardware interaction between the website and the user is necessary for the user to be able to access or use the website’s large pool of resources.

## Software Interfaces

The physics research and information that will be collected from the Physics Team will be used to as a basis for the whole UPOD website to function around. Everything from the information projected to the libraries of information available on the UPOD website will be supported by the physics information collected. The equations and formulas that will be produced by MathJax will be focused on mainly presenting the equations and formulas of the physics concepts and topics that will be covered by UPOD. The Animations and the overall look of the UPOD website will be derived from physics information and will reflect the whole aspect of the 6 dynamics of physics that UPOD is currently covering.

## Communications Interfaces

The Physics Team will regularly be communicating with the MathJax Team, the Animations Team, and the Front-end Team. Using various Medias of communication such as Facebook and slack, the line of communication will be kept open as to define an opportunities or confusions that may arise when collaborating and working together. Also, open meetings between members of the team or team leaders will occur frequently as to keep an up-to-date basis on how well the project is moving along and where improvements could be made.

# System Features

## Physics Information and Research

4.1.1 Description

The physics information and researched collected from the Physics Team is of High priority because it is used throughout the whole UPOD website and will be what the website is portraying throughout. The penalty of having errors with the physics information collected is that the whole validity of the UPOD website might be questioned as a result of information shown being incorrect. The cost of researching the physics information required to cover the topics and subtopics required for the UPOD website are completely free, and many of the concepts can be found online. It is crucial that the information that is to be used is reviewed and made sure that it is correct, which may include double-checking the information.

The benefit of creating a completely new UPOD website with our own animations and diagrams and the way the information is presented is that it is solely based on certain aspects of physics. This means that the content on the website will be more focused on portraying and helping users understand aspects of physics more clearly than other websites that showcase more than one subject.

4.1.2 Functional Requirements

4.1.2.1 – The physics information and researched that is collected must be correct and must be validated before they are passed on the MathJax, Animations, and Front-end Team to ensure accuracy in the other parts of the website.

4.1.2.2 – The physics information for the UPOD website must be of the 6 aspects of physics that the website will be providing to the users: Fundamentals, Classical Mechanics, Optics, Electricity and Magnetism, Quantum Mechanics and Statistical Mechanics

4.1.2.3 – The information that is collected regarding the 6 aspects of the physics that is to be recorded must include relevant information to the topics and will include problems as well as equations

4.1.2.4 – The units and explanations for each variable of the equation must also be present for the physics information

4.1.2.5 – The subtopics pertaining to certain topics of the 6 aspects of physics must also be included and covered by the physics information.

## Animations and MathJax

4.2.1 Description

The physics information that is to be used by the Animations and MathJax Team must be relevant to the 6 aspects of physics covered and must be correct so that they can be visually represented correctly. This is high priority, since the physics equations and information must be correct in order for the user to be able to accurately understand the material as well the website to gain valid credibility for displaying the correct information.

4.2.2 Functional Requirements

4.2.2.1 – The physics information that includes equations and formulas as well as appropriate information pertaining to the physics topic being covered must be correct.

4.2.2.2 – The information will be used by the MathJax and Animations Team to display certain interactive diagrams and sample problems/links to videos that will help the user better understand the topic at hand.

4.2.2.3 – The equations that will be displayed by the MathJax Team must allow users to rearrange equations and formulas and use them in sample problems that are given.

4.2.2.4 – The units and explanations for each variable for each equation must be displayed and remain visible as to show the user exactly what each formula is related to and how it is useful in the topic they are looking at.

4.2.2.5 – The animations and videos that are linked to the physics topic covered must be relevant to the physics topic that it is covering.

4.2.2.6 – Links to sample problems must also be visible under “Suggestions” as to show possible additional help that the user can receive.