Software Requirements Specification

for

Canvas

Version 1.0 approved

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Group 2

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Revision History

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# 引言

## 需求规格说明书目的

编写本需求规格说明书的目的是为了详细规定 Canvas 在线教学系统的产品需求与系统的功能描述，以通过详细的文字语言描述向项目委托方与程序开发方展现系统开发过程中的每一个部分与系统最终的功能，以便及早发现功能需求中的不一致并及时协调修订。同时，此文档也规定了程序开发方模块划分与工作分配，方便开发工作进行得更加顺利与明确。

## Document Conventions

<Describe any standards or typographical conventions that were followed when writing this SRS, such as fonts or highlighting that have special significance. For example, state whether priorities for higher-level requirements are assumed to be inherited by detailed requirements, or whether every requirement statement is to have its own priority.>

## 读者与阅读建议

本文的读者为：项目委托方与开发者。项目委托方建议着重阅读本文的第二章，以全面了解项目的构思，即使发现异常。开发者建议仔细阅读本文的第三章、第四章与第五章，以全面了解软件的API设计、软件功能设置与程序的性能需求设计。

## 软件作用范围

此 Canvas 在线教学系统使用运行在 Linux 环境的云服务器中，后台程序使用 PHP 与 MySQL 进行编写，对外提供标准 Restful API 以供调用，Web前端基于 Bootsrap 响应式的开发框架，按照 HTML5 标准进行开发。

此教学系统应能够在移动端、PC端上流畅且无误地运行，同时软件显示内容要能够根据设备的显示尺寸自适应地调整。由于，PC端与移动端的系统种类与浏览器种类繁多且很多设备过于老旧，内核过时，所以在此列出能够移动端浏览器与PC端浏览器的表格：

|  | Chrome | Firefox | Safari | Android Browser & WebView | Microsoft Edge |
| --- | --- | --- | --- | --- | --- |
| Android | 支持 | 支持 | 无 | 支持Android 5.0及以上 | 支持 |
| iOS | 支持 | 支持 | 支持 | 无 | 支持 |
| Windows 10 Mobile | 无 | 无 | 无 | 无 | 支持 |

|  | Chrome | Firefox | Internet Explorer | Microsoft Edge | Opera | Safari |
| --- | --- | --- | --- | --- | --- | --- |
| Mac | 支持 | 支持 | 无 | N/A | 支持 | 支持 |
| Windows | 支持 | 支持 | 支持 IE10 即以上 | 支持 | 支持 | 不支持 |

本系统的面向的普通用户有教师、学生。本系统可以为教师的教学提供帮助，将教学内容在线化，支持在线发布教学消息、文本教学内容、课堂考试等功能。同时，能够让同学可以随时线上讨论、在线复习教学内容、即使收到消息与考试成绩。

## 引用

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. Provide enough information so that the reader could access a copy of each reference, including title, author, version number, date, and source or location.>

# 项目概述

## 软件前景

<Describe the context and origin of the product being specified in this SRS. For example, state whether this product is a follow-on member of a product family, a replacement for certain existing systems, or a new, self-contained product. If the SRS defines a component of a larger system, relate the requirements of the larger system to the functionality of this software and identify interfaces between the two. A simple diagram that shows the major components of the overall system, subsystem interconnections, and external interfaces can be helpful.>

## 软件功能

### 账户功能

使用此软件的普通账户分为两种：学生与教师，管理账户只有一种：管理员。

管理员拥有批量导入账号的功能，同时支持修改账号的权限。

普通账号可以支持登录，检查用户权限，检索或修改账户信息功能。同时，学生账户可以在线查看自己的成绩等教学信息，教师账户可以在线查看学生的参与度等重要信息。

### 站内信功能

此功能支持在普通账户间相互发送站内邮件、查收站内邮件、回复站内邮件。同时，考试提醒与课程消息也会通过站内信功能发布。

### 课堂功能

此功能包含很多子功能：课程公告，课程大纲，课程单元，课程作业，课程讨论，课程考试。其中课程考试功能与课程讨论功能由于过于复杂，单独拎出在 2.2.4 与 2.2.5 中讨论。

课程公告将显示一个 Markdown 格式的富文本，用于显示本周学生的学习计划，学生账户可以查看课程公告的内容，教师账户可以修改课程公告的内容。

课程大纲同样显示一个 Markdown 格式的富文本，显示本课程这一学期的计划，学生账户拥有查看功能，教师账户拥有修改功能。

课程单元是一个层级菜单，显示学生每一个阶段应学习的课程内容，进入层级菜单即可查看课程具体内容。学生账户拥有查看权限，教师账户拥有修改和查看权限。

课程作业是显示 Markdown 格式富文本的页面，显示学生当前需要提交的作业，提供上传功能。学生账户可以查看作业内容，以上传文件的方式提交作业。老师账户可以新建作业，修改修业内容，批改学生账户提交的作业。

### 考试功能

此功能支持学生在线考试，题目的类型包括：客观题（选择题）与主观题（输入文本答题），客观题支持答案自动判题，主观题需要老师阅读后人为评判。学生账户可以在课程单元中点击考试模块进入考试页面并在规定时间内答题。教师账户，可以在课程单元中添加考试模块，然后编辑考试的内容或者批改学生的主观题目。

### 讨论功能

此功能支持教师与学生相互讨论课程内容，每一个课程学习阶段均有一个讨论版，学生与老师都可以在其中发布帖子或在帖子中讨论。讨论的内容是 Markdown 格式的富文本，支持贴图与上传文件。教师账户与学生账户都可以新增帖子、删除自己的帖子、新增评论或删除自己的评论。同时，教师账户可以任意删除帖子与评论。

## 用户特征

|  |  |
| --- | --- |
| 管理员 | 拥有账户功能的所有权限 |
| 教师 | 可以创建并修改课堂功能内的子功能内容，可以上传课件，评判作业和试题。在讨论版中对帖子进行操作 |
| 学生 | 可以使用课堂功能内的子功能，下载课件，提交作业，参加考试，在讨论版中发布帖子 |

## 系统环境

硬件环境：2.8 GHz Intel Core i7处理器，16 GB 2133 MHz LPDDR3内存，Radeon Pro 560 4 GB、Intel HD Graphics 630 1536 MB图形卡。

软件环境：移动端和PC端的主流浏览器。

## Design and Implementation Constraints

## User Documentation

<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>

1.用户使用手册

2.用户在线求助教程

## Assumptions and Dependencies

# External Interface Requirements

## User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

## Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

## Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

## Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

# System Features

## 登录

### 描述

用户在使用系统前必须使用用户名和密码进行登录操作。

### 激励/响应序列

|  |  |  |
| --- | --- | --- |
|  | 激励 | 响应 |
| 1 | 用户输入用户名和密码后进行登录 |  |
| 2 |  | 将用户名和密码传入系统，并与数据库中存储的数据进行检验 |
| 3 |  | 返回成功验证信息 |
| 4 |  | 通过前端将登陆成功的结果显示给用户，并将页面跳转到系统首页 |

### 功能需求

用户名或密码错误：当用户输入的用户名和密码没有验证成功时，系统将返回“用户名或密码错误”的提示，并清空密码输入区。

## 批量导入账号

### 描述

使用管理员账户可以将要创建的账号的用户名和密码批量导入。批量创建的用户名和密码应提前写入.txt文件，书写格式为每个账号占两行，第一行为用户名，第二行为密码。

### 激励/响应序列

|  |  |  |
| --- | --- | --- |
|  | 激励 | 响应 |
| 1 | 管理员账户成功登录，并选择批量导入账号功能 |  |
| 2 |  | 验证当前账户的权限是否可以进行批量导入账号操作 |
| 3 |  | 验证成功后，显示给管理员一个添加文件选择框，文件格式应为.txt格式 |
| 4 | 管理员在添加文件选择框内选取对应的文件，并点击添加 |  |
|  |  | 读取文件内的账号信息，向数据库中添加所有的账号，添加完成后，在页面向管理员返回添加成功消息 |

### 功能需求

无添加权限：验证当前账户权限失败后，返回无添加权限消息。

添加失败：当读取文件内的账号信息出现格式或非法错误时，返回添加失败消息。

# Other Nonfunctional Requirements

## Performance Requirements

<If there are performance requirements for the product under various circumstances, state them here and explain their rationale, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.>

## Safety Requirements

<Specify those requirements that are concerned with possible loss, damage, or harm that could result from the use of the product. Define any safeguards or actions that must be taken, as well as actions that must be prevented. Refer to any external policies or regulations that state safety issues that affect the product’s design or use. Define any safety certifications that must be satisfied.>

## Security Requirements

<Specify any requirements regarding security or privacy issues surrounding use of the product or protection of the data used or created by the product. Define any user identity authentication requirements. Refer to any external policies or regulations containing security issues that affect the product. Define any security or privacy certifications that must be satisfied.>

## Software Quality Attributes

<Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: adaptability, availability, correctness, flexibility, interoperability, maintainability, portability, reliability, reusability, robustness, testability, and usability. Write these to be specific, quantitative, and verifiable when possible. At the least, clarify the relative preferences for various attributes, such as ease of use over ease of learning.>

## Business Rules

<List any operating principles about the product, such as which individuals or roles can perform which functions under specific circumstances. These are not functional requirements in themselves, but they may imply certain functional requirements to enforce the rules.>

# Other Requirements

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Appendix A: Glossary

<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.>

Appendix B: Analysis Models

<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams.>

Appendix C: To Be Determined List

<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>