College Student and Course Management System

Software Requirements Specification

Version 1.1

10.07.15

Prepared for

CSCI 413 - Principles of Software Engineering

Fall 2015

Table of Contents

**1** **Database Requirements**….………………………………………………………………………………………………………………3

* 1. Database Scope…………………………………………………………………………………………………………………………….3
  2. Student Entity……………………………………………………………………………………………………………………………….3
  3. Faculty Entity………………………………………………………………………………………………………………………………..4
  4. Course…………………………………………………………………………………………………………………………………………..5
  5. Course Section………………………………………………………………………………………………………………………………6
  6. Facility…………………………………………………………………………………………………………………………………………..6
  7. Sub Characteristics and Elements of a Facility……………………………………………………………………………….7
  8. Database Non-Functional Requirement………………………………………………………………………………………..7

1. **Web Application Requirements**……………………………………………………………………………………………………….8
   1. Class Search Related……………………………………………………………………………………………………………………..8
   2. Main Search Related……………………………………………………………………………………………………………………..8
   3. Class Related…………………………………………………………………………………………………………………………………8
   4. Additional……………………………………………………………………………………………………………………………………..8
2. **Interface Requirements**…………………………………………………………………………………………………………………..8
   1. Login/Logout Functionality……………………………………………………………………………………………………………8
   2. Homepage Layout and Functionality…………………………………………………………………………………………….8
   3. Class Layout and Functionality……………………………………………………………………………………………………..9
   4. Class Planner Layout and Functionality………………………………………………………………………………………..9
   5. Transcript Page Layout and Functionality…………………………………………………………………………………….9
   6. Navigation Layout and Functionality……………………………………………………………………………………………9

Campus Reconnection Requirements

1. **Database Requirements**
   1. **Database scope**

The database will represent and hold all data related to the overall scope of the “College Student and Course Management System” project. The database must be accessible to the web application that is described in this requirements document.  The database must protect sensitive Student and Faculty information. The main entities to be represented:

1. Student
2. Faculty
3. Course
4. Facility
   1. **Student entity**

The Student entity describes a single student of the university, containing relevant data such as identification, discipline, enrolled courses, and contact information.  Every student to enroll in the university system is required exactly one Student table record, which persists even after the student is no longer enrolled in the system.  This ensures searchable data retention on past students as well as current students.  A student that returns to the university after leaving will continue the same record.

Essential characteristics and elements:

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Related Element(s)** | **Description** |
| Unique student identifier | Identification Number | Seven digit code unique to each student. |
| Name | First, Last, Middle | First and last name required, middle name is optional. |
| Student enrollment status | Full Time, Part-time, Undergraduate, Graduate, Doctorate, PHD, Certificate, Suspended, Academic Probation | Student can be either full or part time. |
| Major(s) | One-to-many | Option to have major as “Undeclared”. |
| Minor(s) | One-to-many | Optional field. |
| Course(s) | Past, current, future courses, grades earned, course enrollment status, waitlist position | Each student has enrollment information the database should keep track of. |
| Cumulative Grade Point Average | GPA based on a 4.0 scale | Cumulative from all semesters attended. |
| Credits earned | Total academic credits earned | Credits reflect standing; freshman, sophomore, junior, senior. |
| Active Military Service or not. | Yes or no | Not specific to any military branch. |
| Personal contact information | Addresses, Phone Numbers, Emergency Contact Information | Students can have more than one instance of contact information. |
| Academic Advisor | Academic advisor assigned to student. | Advisor is a faculty member. |
| Personal identification photo | Official student identification photo for university ID, and used for all university related function. | Photo is linked to student’s identification number. |

* 1. **Faculty entity**

The Faculty entity describes a single faculty member employed by the university and contains relevant information such as identification, position, department, and contact information.  Each faculty member to be employed by the university is required exactly one Faculty table record, which persists even after that faculty member leaves the university.  This ensures searchable data retention on past faculty members as well as current faculty members.  Some faculty members are able to be advisors to one or more students.

Essential characteristics and elements

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Related Element(s)** | **Description** |
| Unique faculty identifier | Faculty Identification Number | Access faculty information. |
| Name | First, Last, Middle | First and last name required, middle name is optional |
| Department | Department name | Department in which the faculty member is employed |
| Employment position/title | Professor, Adjunct Professor, Associate Professor, Visiting Professor, Lecturer, Chairperson, | Title reflects security access level within the system. |
| Whether student advisor or not | True or False value | Simply states if the faculty member is advising at least one student. |
| Personal contact information | Addresses, Phone Numbers, Emergency Contact Information | Faculty can have more than one instance of contact information. |
| Personal identification photo | Official faculty identification photo for university ID, and used for all university related function. | Photo is linked to faculty identification number. |
| Office | Room where office is located | Office assigned to faculty member. |

* 1. **Course**

The Course entity describes a single course in the university system, which is defined as a collection of individual class instances (referred to as ‘sections’ of the course) that share a standardized curriculum and count for the same general university credit.  Relevant information for a course includes the course’s name, the offering department, prerequisite and/or co-requisite courses, applicable general education categories, the course’s credit value, and any applicable fee.  Courses that are dropped from future university offerings will retain their records for data retention purposes.

Essential characteristics and elements:

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Related Element(s)** | **Description** |
| Unique course identifier | Course identification number | Number is unique to each instance of the course. |
| Course department | Department name | Which department the course belongs to. |
| General Education Requirement Category | First Year Experience Course (F), Communications (C), Quantitative Reasoning (R), Science & Technology (S), Humanities & Fine Arts(A), Social & Behavioral Sciences (B), Wellness (W), Cultural Diversity (D), Global Perspectives (G) | University determined general education requirement categories. |
| Course Prerequisite | Course number(s) | Course(s) required before a certain course may be taken |
| Course Co-requisite | Course number(s) | Course(s) required to be taken at the same time |
| Course Credits | Number of course credits | Total credits associated with completion of course |
| Course Fee | Dollar amount associated with course | Additional required fee to enroll in particular course |

* 1. **Course Section:**

Individual instances of a course are referred to as sections.  The Section entity describes a single one of these sections, and contains relevant information such as the section’s instructor, meeting location, meeting times, required texts, seating capacity, and any applicable waitlist.  Section records are retained even after the section has terminated.

Essential characteristics and elements:

|  |  |  |
| --- | --- | --- |
| **Characteristics** | **Related Element(s)** | **Description** |
| Unique section identifier | Section identification number | Number is unique to each instance of a course section. |
| Section instructor | Instructor’s name | The instructor of the section.  Must be a faculty member. |
| Section room | Room number | The room in which the section is instructed |
| Section year | Year number | The year in which the section of the course is instructed |
| Section academic season | Academic season and course duration | Fall, Spring, Summer 4 week, Summer 8 week, Summer 12 week |
| Section schedule | The weekly time schedule for section meetings | The specific days of the week and time of day the course is scheduled to meet |
| Section capacity | Number of students allowed per section | The maximum capacity of students determined for the section |
| Section waitlist total | Number of students on waitlist for section | Contains the number of waitlisted students for the given section |
| Section required text | Names of textbooks | Contains the required textbook(s) for the given section |
| Section online only | True or false value | Describes whether the section is online or not |

* 1. **Facility**

The Facility entity represents a single building or section of a building that provides a cohesive suite of lecture rooms, offices, labs, and other related academic facilities.  Relevant information for a Facility include its name, address, and geographical location. If at any point a facility becomes the site of a university-related academic event or function within the scope of this application, it will require exactly one Facility table record, which is retained even after the facility no longer contains any relevant events or functions for data retention purposes.

Essential characteristics and elements:

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Related Element(s)** | **Description** |
| Unique Facility Identifier | Course identification number | Access facility information |
| Facility Name | Facility name | Name given by university used instead of building number. |
| Facility Address | Street, City, State, Postcode | Location of facility |
| Facility longitude and latitude | Longitude and Latitude | For map related functions, student class planning |

* 1. **Sub characteristics and elements of a facility:**

Each facility can contain any number of rooms suitable for holding events like course sections, or serve as the office of a faculty member.  These are defined by the Room entity, which simply contains a room’s unique identifier and its seating capacity, if applicable.  Rooms that are no longer used by the university retain their records.

|  |  |  |
| --- | --- | --- |
| **Characteristics** | **Related Element(s)** | **Description** |
| Room | Room number | Rooms belonging to a facility |
| Room seating capacity | Number of seats | Contain the maximum seating number for each room |

* 1. **Database Non-Functional Requirements**

The database must be implemented with security features to protect sensitive student and faculty related data.

Multi-Level access control to determine what a user is able to do in the system.

On a separate server from which the application code is executed.

1. **Web Application Requirements**

The following is a list of web requirements for this application. Everything here applies to server-side interactions.

* 1. **Class Search Related**
     1. This section describes how class searching will operate.
     2. When browsing for courses, the system will automatically select the current semester for the desired courses. These courses will be NDSU courses only.
     3. Search options for class timings, class dates, and category should be available to the user.
  2. **Main Search Related**
     1. This section describes how the main search bar will operate.
     2. Any function of campus reconnection will be accessible through a search query of the main search bar.
     3. Results should appear on a separate page.
  3. **ClassRelated**
     1. This section describes how the pages dealing with class management will operate.
     2. Class search queries will show results for classes matching search criteria. Users can add the classes from there.
  4. **Other**
     1. This section describes how any miscellaneous portion of the application will operate.
     2. Passwords will allow special characters for extra security.
     3. Advisors will have the ability to modify students’ holds.

1. **Interface Requirements**

The following is a list of user interface requirements for this application. Everything here applies to client-side interactions.

* 1. **Login/Logout Layout and Functionality**
     1. This section describes how the login function will operate.
     2. The user will login to the initial site using their credentials.
     3. If the user fails to login, send a warning.
     4. If the user fails subsequently, they will be given a link to reset their password.
     5. While the user is logged in, they can log out using a link.
  2. **Homepage Layout and Functionality**
     1. This section describes how the homepage should be displayed.
     2. The top of the page contains a series of four drop-down menus: personal, class management, expenses, and other.
     3. An interactive weekly schedule will be displayed directly after login on the homepage providing information about other available times.
     4. A quick list box will show frequently-accessed information.
     5. Quick list will show payment owed, advisor information, and emergency contact information.
     6. All personal and sensitive information displayed on the homepage will be censored.
  3. **Class Layout and Functionality**
     1. This section describes how courses should be displayed and interacted with.
     2. The interface for dropping and adding classes will be separated.
     3. In the class adding interface, elements will be color coded to indicate capacity of the class. For disability reasons, information will be displayed as well.
     4. Locations listed on the class pages will be links to a map where their physical location can be shown.
     5. Students’ waitlist number should be accessible in two clicks.
     6. Additional course fee totals will be displayed on the class page.
     7. In the class dropping page, users can mark classes they want to drop. After finalizing the system will prompt them several times asking if they are sure that this is the action they want to take. A password will be required to drop a class.
     8. A weekly schedule will be constantly displayed and will update on the event of classes being added and dropped.­
  4. **Class Planner Layout and Functionality**
     1. This section describes the class planner utility.
     2. A Google map will be displayed to show the locations of all a student’s classes.
     3. A weekly schedule will be displayed focusing on time constraints.
  5. **Transcript Page Layout and Functionality**
     1. This section describes the transcript viewing utility.
     2. Unofficial transcript will include a table for a specified semester containing: course, description, grade, attempted points, earned points, and total point columns.
     3. At the end of the unofficial transcript page, there will be an option for downloading the transcript and an option for requesting an official transcript to be sent.
     4. The official transcript page will consist of a place to enter information about who and where the transcript will go. The student account will be billed for this and displayed on the homepage.
  6. **Navigation Layout and Functionality**
     1. This section describes how pages will be navigated and how they interact with the user.
     2. Students should be able to enroll in courses within 30 seconds or less.
     3. The menus will be sub-divided into separate functionalities.
     4. At any point, a user should only need to click 3 times to navigate to a desired page or function in order to minimize clicking. This action will also help reduce redundancy in the system.
     5. A pop-up notification will occur when a user is required to perform any action. The user will also be able to click on the notification, which will take them to the page that will allow them to accomplish what they need to.
     6. Allow transcripts to be downloaded without blocking the download first.
     7. Develop a back button that works with the browser to actually navigate backwards.
     8. Advisors should be able to send an email to their advisees.
     9. The class list should include more information about who is taking the class (class roster) and how many of them are on the waitlist.
     10. Professors should be able to enter both midterm and final grades.