College Student and Course Management System

Software Requirements Specification

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Campus Reconnection Requirements

# Database Requirements

## Database scope

The database shall 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 such as course grades, financial payments, etc. The main entities to be represented:

1. Student
2. Faculty
3. Course
4. Section
5. Facility

## 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 shall 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, Matriculated, Incomplete | Student can be either full or part time. |
| Major(s) | One student can have one or more majors. | Option to have major to “Undeclared”. |
| Minor(s) | One student can have one or more minors. | 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 and schools 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. Student can have multiple advisors. |
| 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. |
| Personal weekly scheduler | Variable length student appointment or meeting calendar scheduler. | Student can, schedule, and manage appointments. Such as student advising session. |

## 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. |
| Personal weekly scheduler | Variable length faculty appointment or meeting calendar scheduler. | Faculty can create, schedule, and manage appointments. Such as student advising session. |

## 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 shall 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. If the course does not fulfil any, it will be empty. |
| Course Description | Store and display a description of up to 140 characters. | Basic description of course. |
| 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 |
| Curriculum Guide | List of required courses for a specific major or minor. | Defines current and past requirements for a given major. |

## 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. |
| Unique course identifier | Course identification number | Unique identifier for the course that includes the section. |
| Section instructor | Instructor’s name | The instructor of the section.  Must be a faculty member. |
| Section Facility | Facility ID | The facility on campus in which section is instructed |
| 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, Fall & Spring 6 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 |

## 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 shall 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 |

## 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 |
| Room Status | Reserved, Open | Used to determine if a room is available for a section and time during a particular semester. No double booking. |

## Database Non-Functional Requirements

The database must be implemented with security features to protect sensitive student and faculty related data. All query data will be stored server-side in a three-tier system, where the user will only be able to access server information after logging in. Once logged in, contact information related to the user such as phone number(s), address, and email address will be partially obscured from the user, only giving enough information for the user to distinguish the information and not enough for a potential perpetrator to learn it. The physical servers shall be stored in a bunker under the Utah desert in an underwater tank patrolled by sharks with laser beams strapped to their heads.

1. **Application Requirements**

The following is a list of requirements for this application. Everything here applies to the webpage functionality and user interaction with the site.

## Class Search Related

* + 1. This section describes how class searching shall operate.
    2. When browsing for courses, the system shall automatically select the current semester for the desired courses. These courses shall be NDSU courses only.
    3. Search options for class timings, class dates, and category should be available to the user.

## Main Search Related

* + 1. This section describes how the main search bar shall operate.
    2. Any function of campus reconnection shall be accessible through a search query of the main search bar.
    3. Results should appear on a separate page.

## ClassRelated

* + 1. This section describes how the pages dealing with class management shall operate.
    2. Class search queries shall show results for classes matching search criteria. Users can add the classes from there.

## Login/Logout Layout and Functionality

* + 1. This section describes how the login function shall operate.
    2. The login/logout process shall be the same for student, faculty and administrators.
    3. The user shall login to the initial site using their credentials. This will include the username and their corresponding password.
       1. Usernames shall be unique across all users.
       2. Passwords should contain a mix of numbers letters and special characters.
    4. The main login screen shall have boxes for the user to enter their unique username and passwords. An additional button will be available if the user forgot their password.
    5. If the user fails to login to the site, display a warning box stating that access has been denied.
    6. If the user fails to login after three tries, they shall be sent a link to their email account to reset their password.
    7. While the user is logged in, they can log out using a link.

## Homepage Layout and Functionality - Student

* + 1. This section describes how the homepage for students should be displayed.
    2. The top of the page contains a series of four drop-down menus: personal, class management, expenses, and other.
       1. The personal tab includes links to the student’s transcript, advisor information, and holds/ToDo information from the university.
       2. The class management tab includes links to the student’s class planner, the “drop classes” page, the “add classes” page.
       3. The expenses tab will include links to housing expenses, purchase of parking permits, and general fees issued by the university.
       4. The other tab will hold any links to allow the students to purchase event tickets or pay activity fees. This will also hold any additional links the university may want to add.
    3. A weekly schedule shall be displayed directly after login on the homepage providing information about other available times.
    4. A quick list box shall show frequently-accessed information.

3.2.4.1 The same quick list shall also show payment owed, advisor information, and emergency contact information.

* + 1. All personal and sensitive information displayed on the homepage shall be censored. The page will not display personal information for the student, including phone number, address, emergency contacts, and transcript details.

## Class Layout and Functionality - Student

* + 1. This section describes how courses should be displayed and interacted with.
    2. The interface for dropping and adding classes shall be separated on two different pages.
    3. In the class adding interface, elements shall be color coded to indicate capacity of the class. Green cells indicate that the class has openings. Red cells indicate that the class is full to capacity. For disability reasons, information shall be displayed as well. A green circle will indicate the class has openings. A red triangle indicates that the class is full to capacity.
    4. Locations listed on the class pages shall be links to a map where their physical location can be shown.
    5. Students’ waitlist number should be accessible in two clicks from the ‘add class’ page.
    6. Additional course fee totals shall be displayed on the class page.
    7. In the class dropping page, users can mark classes they want to drop. After finalizing the system shall prompt them two separate times asking if they are sure that this is the action they want to take. A password shall be required to drop a class.
    8. A weekly schedule shall be constantly displayed on the ‘add class’ and ‘drop class’ pages and shall update on the event of classes being added and dropped. The class schedule displayed on the home page will also be updated.

## Class Planner Layout and Functionality - Student

* + 1. This section describes the class planner utility.
    2. A template of a tentative course schedule shall be displayed according to the student’s chosen major(s) and/or minor(s). This template shall include the University’s required generals as well as the required courses for the major(s) and/or minor(s).
    3. The tentative course schedule will be updated each semester to record which classes the student has taken. This update will take place once the student registers for courses each semester.
    4. A Google map shall be displayed to show the locations of all a student’s classes.
    5. A weekly schedule shall be displayed focusing on time constraints.

## Transcript Page Layout and Functionality - Student

* + 1. This section describes the transcript viewing utility.
    2. Unofficial transcript shall 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 shall be an option for downloading the transcript and an option for requesting an official transcript to be sent.
    4. The official transcript page shall consist of a place to enter information about who and where the transcript shall go. The student account shall be billed for this and the charges displayed on the homepage in the quick list box under billing information.

## Navigation Layout - Student

* + 1. This section describes how pages shall be navigated and how they interact with the user.
    2. Students should be able to enroll in a course within 30 seconds or less once they are trained in the programs use.
    3. 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 shall also help reduce redundancy in the system.
    4. A pop-up notification shall occur when a user is required to perform any action. The user shall also be able to click on the notification, which shall take them to the page that shall allow them to accomplish what they need to.

## Functionality - Student

* + 1. Develop a back button that works with the browser to actually navigate backwards.
    2. Students should be able to send an email to their advisors.

## Homepage Layout and Functionality - Faculty

* + 1. This section describes how the homepage for faculty should be displayed.
    2. The top of the page contains a series of four drop-down menus: personal, class

management, expenses, and other.

* + - 1. The personal tab includes links to advisee information, any human resource pages used by the university, personal profile, and hold/todo/inbox for notifications from the university.
      2. The class management tab includes links to the faculty’s class planner as well as course plans for students.
      3. The expenses tab will include links to paystubs and the purchase of parking permits.
      4. The other tab will hold any links to allow the faculty to purchase event tickets. This will also hold any additional links the university may want to add.
    1. A weekly schedule shall be displayed directly after login on the homepage providing information about the faculty member’s current schedule. This schedule will update weekly to reflect meetings or, in the event of an advisor, any request for meetings from advisees.
    2. A quick list box shall show frequently-accessed information. This information shall include emergency contact info, the faculty members supervisor, and the next scheduled meeting or class.
    3. All personal and sensitive information displayed on the homepage shall be censored. The page will not display personal information for the faculty member, including phone number, address, emergency contacts or payroll information.

## Class Layout and Functionality - Faculty

* + 1. This section describes how courses should be displayed and interacted with.
    2. The interface for viewing current classes the faculty member is teaching as well as the student information for those classes.
       1. Student information included under each class shall be limited to the student’s name, id number, class standing, and picture.
    3. Each class in the faculty’s schedule shall be listed in time order and shall have a quick reference to the number of students enrolled as well as the class capacity.
    4. Faculty members shall not be allowed to add any students to a class that is already full to capacity.
    5. Locations listed on the class pages shall be links to a map where their physical location can be shown.

## Navigation Layout - Faculty

* + 1. This section describes how pages shall be navigated and how they interact with the user.
    2. Faculty should be able to view a student profile from a course within 30 seconds or less once they are trained in the programs use.
    3. 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 shall also help reduce redundancy in the system.
    4. A pop-up notification shall occur when a user is required to perform any action. The user shall also be able to click on the notification, which shall take them to the page that shall allow them to accomplish what they need to.

## Functionality - Faculty

* + 1. Develop a back button that works with the browser to actually navigate backwards.
    2. Advisors should be able to send an email to their advisees.
    3. Advisors shall have the ability to modify students’ holds.
    4. The class list should include more information about who is taking the class (class roster) and how many of them are on the waitlist.
    5. Faculty should be able to enter both midterm and final grades.

## Homepage Layout and Functionality - Administrator

* + 1. This section describes how the homepage for administrators should be displayed.
    2. The top of the page contains a series of four drop-down menus: personal, class expenses, and other.
       1. The personal tab includes links to any human resource pages used by the university.
       2. The expenses tab will include links to paystubs and the purchase of parking permits.
       3. The other tab will hold any links to allow the administrators to purchase event tickets. This will also hold any additional links the university may want to add.
       4. A special instance of administrator will have the ability to assign a professor to a class. Only two of these special administrators will be established per department. They will have an additional class management tab allowing them to manage facilities and make assignments.
    3. A weekly schedule shall be displayed directly after login on the homepage providing information about the administrator’s current schedule. This schedule will update weekly to reflect meetings.
    4. A quick list box shall show frequently-accessed information. This information shall include emergency contact info, the faculty members supervisor, and the next scheduled meeting or class.
    5. All personal and sensitive information displayed on the homepage shall be censored. The page will not display personal information for the administrator, including phone number, address, emergency contacts or payroll information.

## Navigation Layout - Administrator

* + 1. This section describes how pages shall be navigated and how they interact with the user.
    2. 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 shall also help reduce redundancy in the system.
    3. A pop-up notification shall occur when a user is required to perform any action. The user shall also be able to click on the notification, which shall take them to the page that shall allow them to accomplish what they need to.

## Functionality - Administrator

* + 1. Develop a back button that works with the browser to actually navigate backwards.