Software Requirements Specification

for

A.H.F.S.

Version 1.7 approved

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Faculty of Automation, Computers and Electronics

28th February 2024

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Revision History

Name	Date	Reason For Changes	Version
Eusebiu Oprea	01.03.2024	Defined concepts in chapter 1	1.1
Daniel Lisaru	04.03.2024	Contoured functionalities in chapters 2.1 2.2 2.3	1.2
Andrei Roibu	06.03.2024	Finished chapter 2	1.3
Eusebiu Oprea, Andrei Roibu	10.03.2024	Chapter 3	1.4
Daniel Lisaru, Andrei Roibu	15.03.2024	Defined requirements in chapter 4	1.5
Andrei Roibu, Daniel Lisaru	17.03.2024	Chapter 5	1.6
Eusebiu Oprea	18.03.2024	Appendix	1.7

1.   Introduction

1.1   Purpose

This document specifies in detailed view the software system for a "AHFS" (Automatic handler of faculty students)
The scope of the product covered by this SRS is to collect data about the curriculum, study programs and their students, data handling, report generation, generation of information thru the use of a web portal, and the management of document flow within the faculty's secretary.

1.2   Document Conventions

 Listed in Appendix A.

1.3   Intended Audience and Reading Suggestions

The intended audience of this document are the users (students, teachers) and developers. Each of them can find insightful information in regards to their needs.
Categorized reading suggestions:
   - users can find information about: requirements, tutorials for product usage
   - developers: used tools, system features, technical details, references

1.4   Product Scope

The scope of this product is to have a unified platform for the university of Craiova to manage and handle document related activities such as document generation and upload (certificates, schedules and timetables), tracking information about students(grades, scholarships, personal information). This update to the current version will enhance the interface and user-friendliness, keeping the site and software up to date with the current standards and technology, resulting in a better customer experience and satisfaction.

1.5   References

● Project assignment
  https://drive.google.com/file/d/12SzwWhxoXwbGilWrym_Ihty4EGSQynNS/view

● Various informations, forums
  https://stackoverflow.com/

https://www.w3schools.com/

- User interface design Guidelines
  https://www.interaction-design.org/literature/article/user-interface-design-guidelines-10-rules-of-thumb

- Websites given for reference
  http://ace.ucv.ro/planuri.html   -   (page not existing)
  http://ace.ucv.ro/orar.html   -   (page not existing)
 http://ace.ucv.ro/evaluarre.html   -   (page not existing)

2.   Overall Description

2.1   Product Perspective

The purpose of the product described is to replace the current Faculty of Automation, Electronics and Computers platform: "evstud". This following project has come into fruition because of the "Databases Application" assignment. This particular subject "AHFS" was handpicked by our team (see the names on the cover) considering it would be a challenging and interesting project to partake in.

2.2   Product Functions

- Admins will create the teachers and students profiles.
- Teachers and students will be able to log in into their respective accounts.
- Students will be able to modify and view their respective personal information
- Students will be able to upload and view their respective student documents Students will be able to download certificates and study documents
- Students will be able to view their respective grades
- Students will be able to view and download timetables/schedules
- Teachers will be able to modify and view their respective personal information
- Teachers will be able to upload the grades for each student for they respective subject
- Teachers will be able to view and download timetables/schedules
- Teachers will be able to view a student list which they can filter by various criteria
- Admins will create the student lists
- Admins will create and upload the timetables and schedules
- Admins will be able to view and modify: the teachers information, the students information, the grades and the student documents
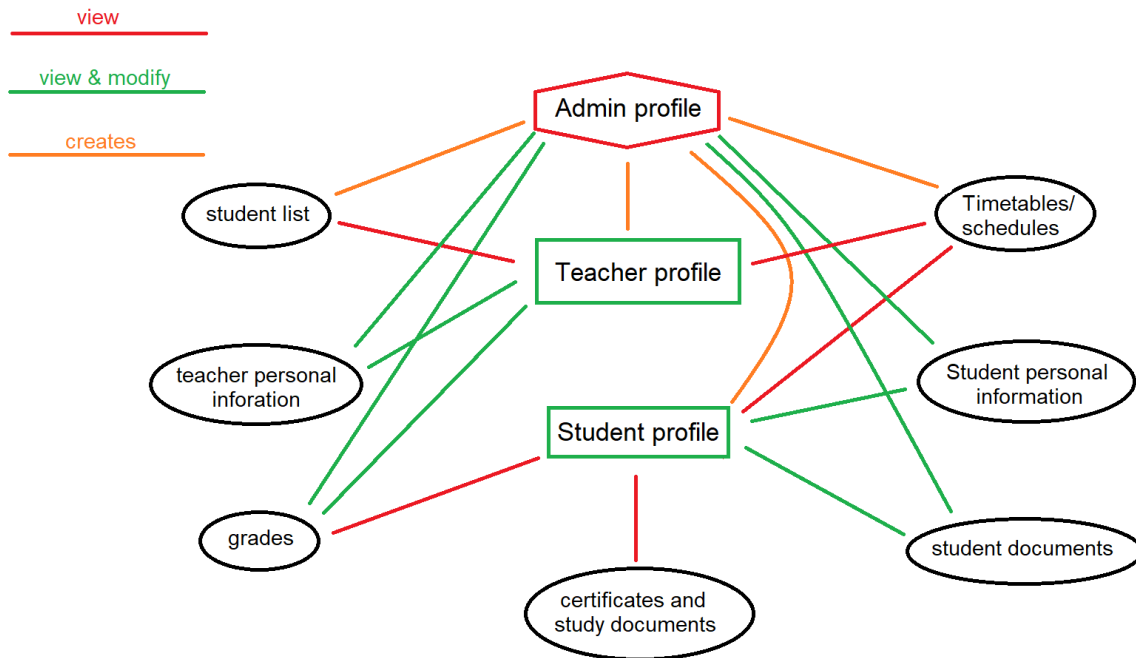
- simplified picture of the major groups of related requirements and how they relate

2.3   User Classes and Characteristics

The user classes anticipated to use this product based on use, level of technical expertise and subset of functions used are: students, teachers and system admins.
- Students will require the least amount of technical expertise, the specific functions they will be using (viewing and downloading timetables, viewing personal grades, generating certificates, viewing news about events and information about faculty programs) will have a very intuitive and easy to use interface.
- Teachers will require a medium level of technical expertise to be able to fulfill their respective purposes (updating the students grades, viewing and downloading their timetable)
- System admins is the user class that will be responsible for updating the information on the platform (events, faculty organized programs, events, information regarding applying to the faculty and other secretary information), handling students and teachers accounts, and uploading documents (timetables, schedules). This will require a high level of expertise and high privilege levels.

2.4   Operating Environment

Hardware: Intel® Core 2 Duo Processor E8400, 2 GB RAM, 512 MB storage space, integrated GPU.
Operating System (OS): Windows 7 or later, macOS 12 or later and Linux Ubuntu 20.04 LTS or later.
Browser: The application will run as intended on any of the popular browsers.
Database management: Microsoft SSMS with Microsoft SQL Server 2022 with the database.

2.5   Design and Implementation Constraints

Language Requirements: English.
Licenses Requirements:
● Visual Studio 2022 (Version 17.9.2)
● Visual Studio Code (version 1.87.2)
● SQL Server Management Studio (SSMS) (version 19.3)

2.6   User Documentation

A user manual document will be created and delivered along with the software release.
For on-line help please contact lisaru.daniel.v2j@student.ucv.ro
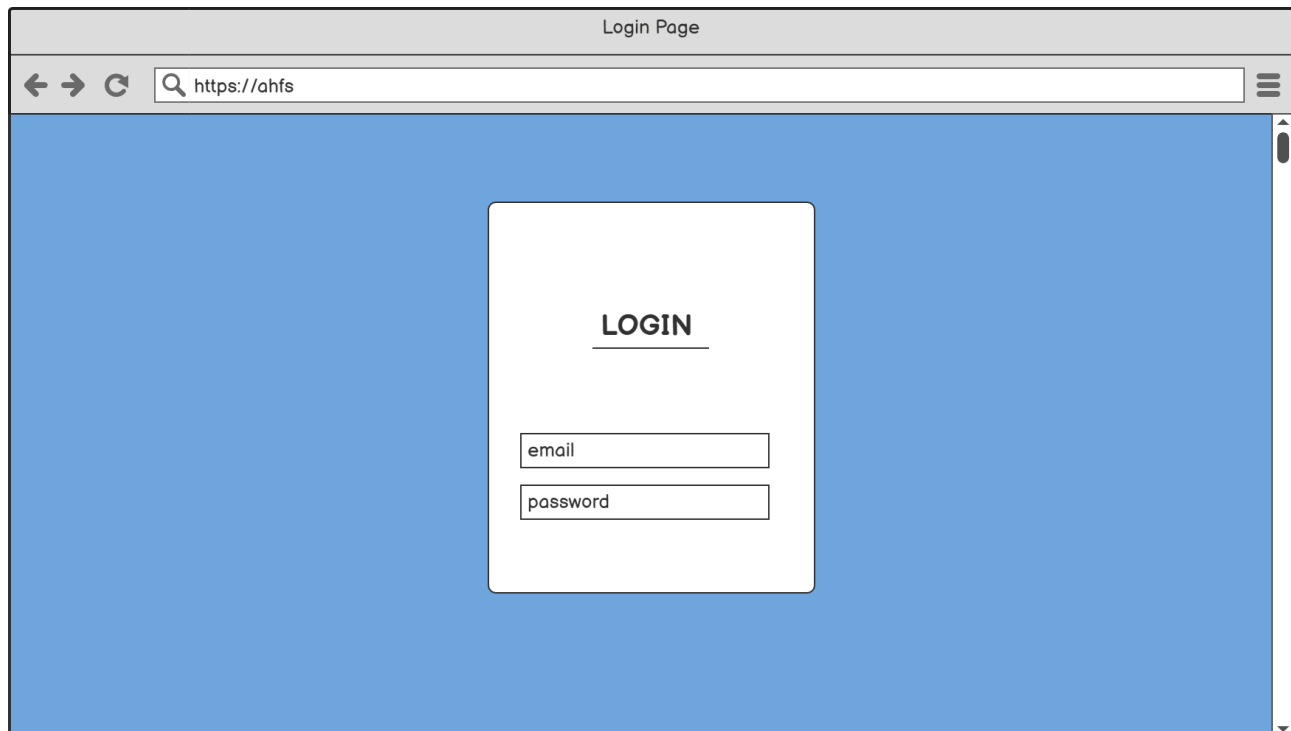
2.7   Assumptions and Dependencies

Not applicable.

3. External Interface Requirements

3.1 User Interfaces
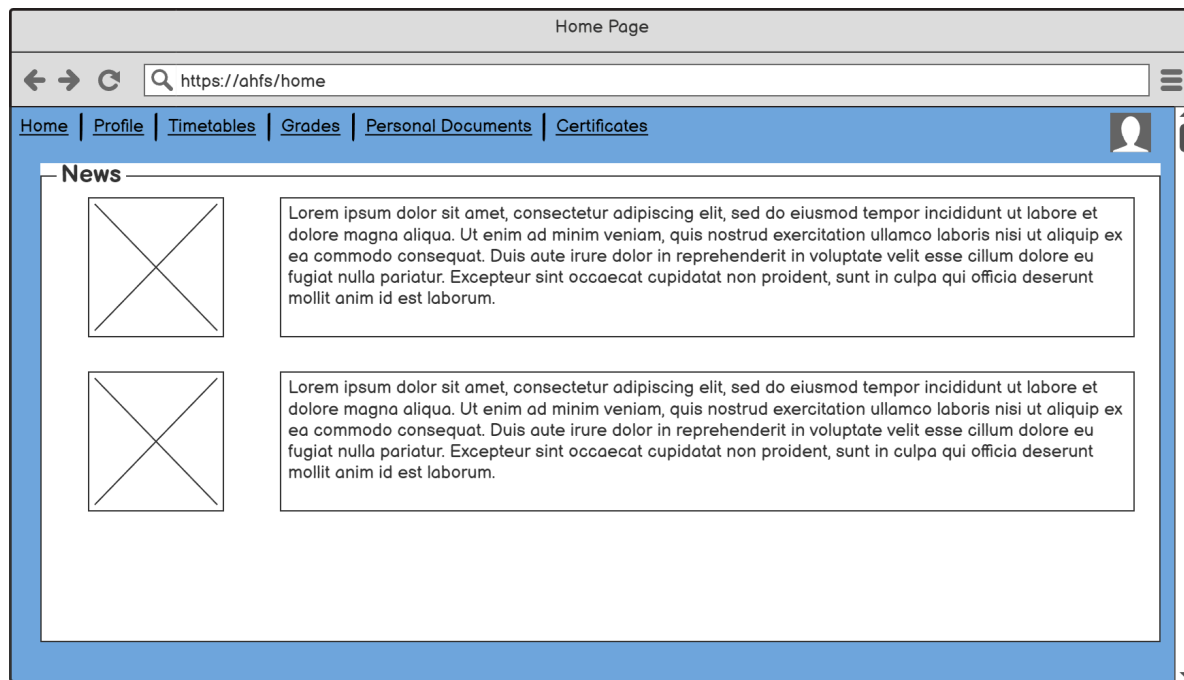
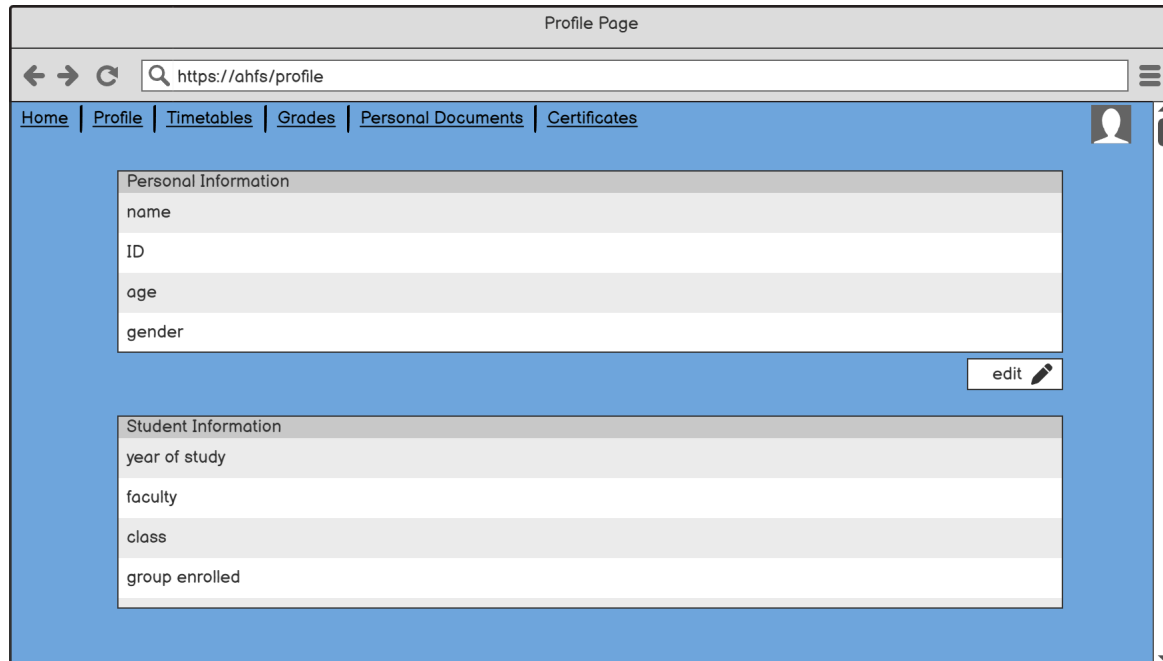-This is the login page that is shown to all users in order to enter their credentials.

Login Page

← → C 🔍 https://ahfs ≡

LOGIN

email

password

-When the student/professor/admin is logged in, they will be redirected to the home page, which contains a navbar
(present in all pages as well) and some news from the University.

-On the Student Profile the students will be able to see their faculty information, as well as to edit if necessary the personal information.
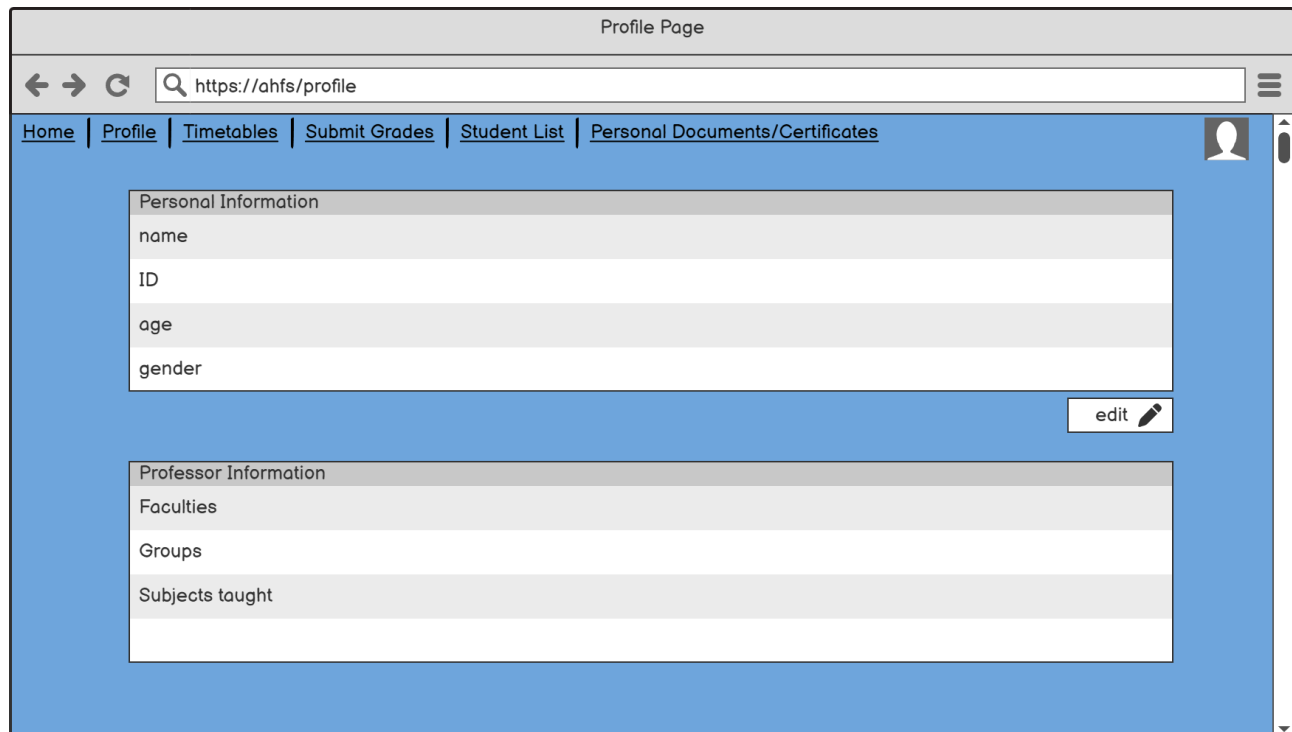
Profile Page

https://ahfs/profile

Home | Profile | Timetables | Grades | Personal Documents | Certificates

Personal Information
name
ID
age
gender

edit ✏

Student Information
year of study
faculty
class
group enrolled

-The same is also applicable for the Professor Profile.

Profile Page

https://ahfs/profile

Home | Profile | Timetables | Submit Grades | Student List | Personal Documents/Certificates

Personal Information
name
ID
age
gender

edit ✏

Professor Information
Faculties
Groups
Subjects taught

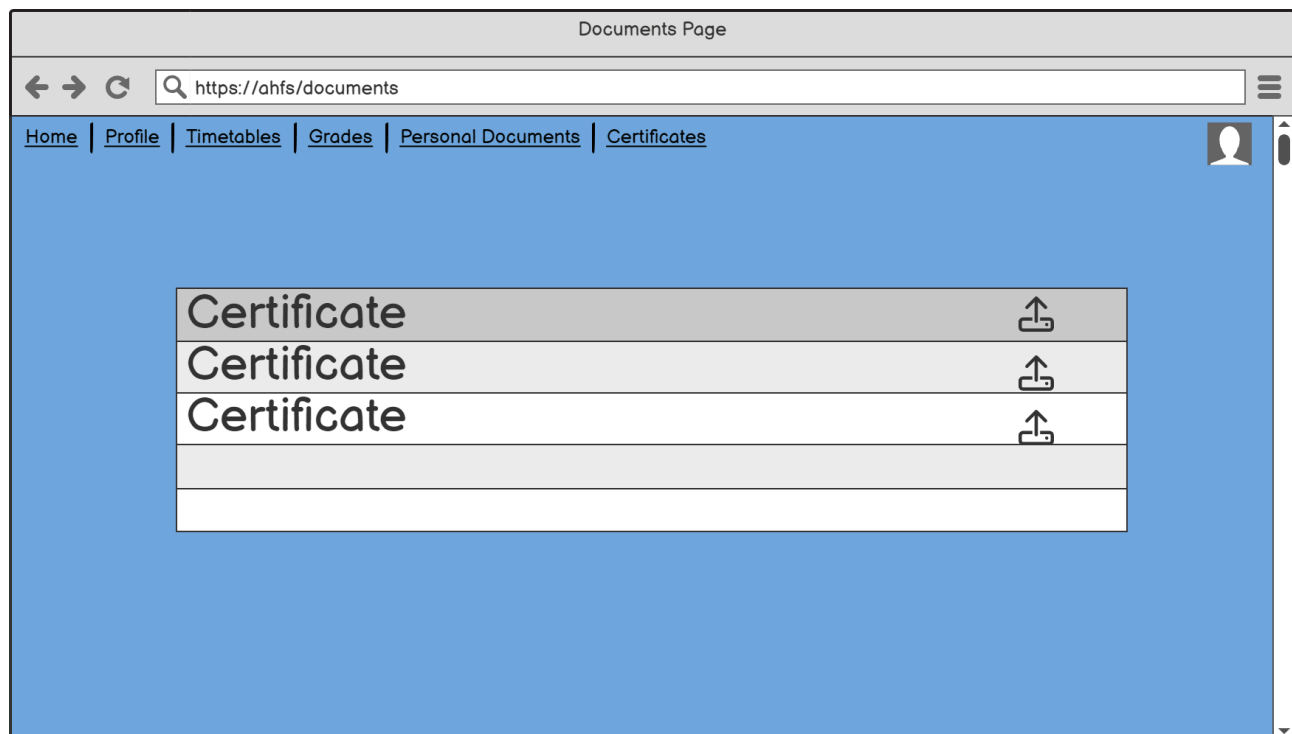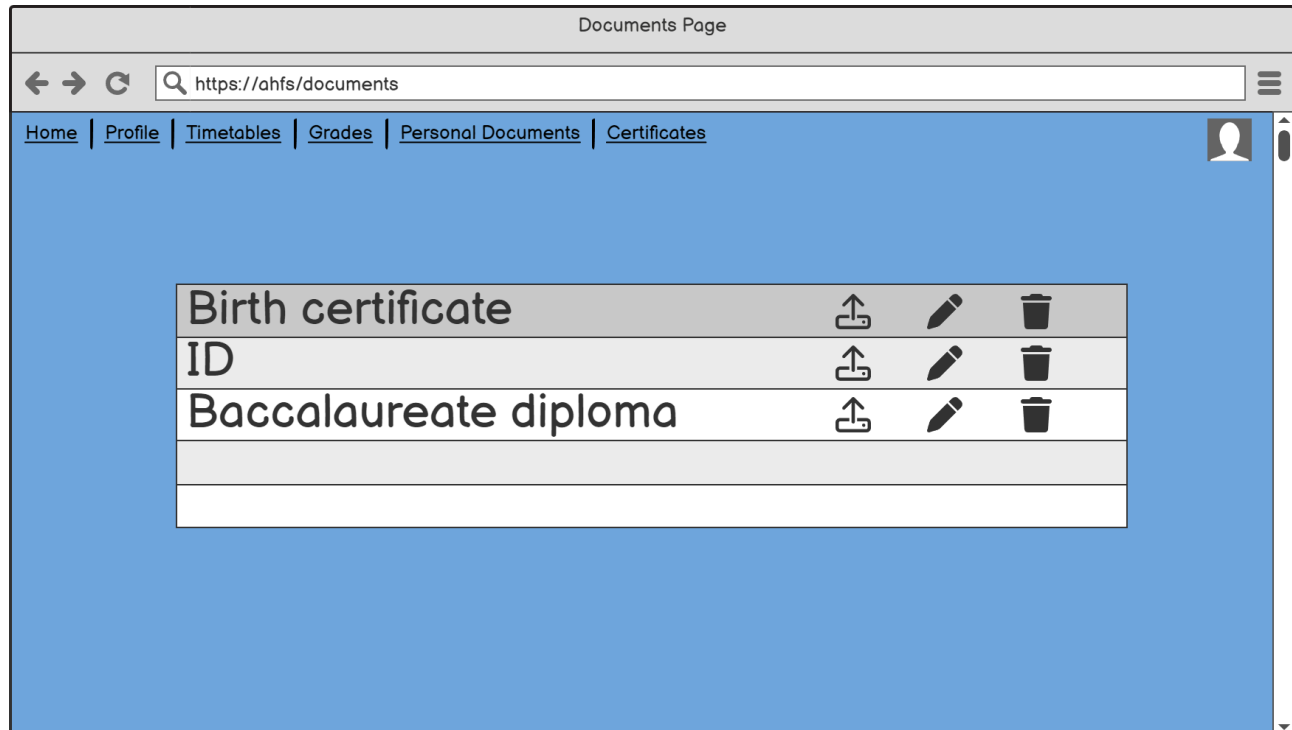-The timetables will be available for both students and professors to download.

Timetables Page

https://ahfs/timetable

Home | Profile | Timetables | Grades | Personal Documents | Certificates

Specialization in Automatics and Applied Informatics (AIA):

Year 1, Semester 1 - download, Semester 2 - download;

Year 2, Semester 1 - download, Semester 2 - download;

Year 3, Semester 1 - download, Semester 2 - download;

Year 4, Semester 1 - download, Semester 2 - download.

Specialization in Computers with Instruction in Romanian (CR):

Year 1, Semester 1 - download, Semester 2 - download;

Year 2, Semester 1 - download, Semester 2 - download;

Year 3, Semester 1 - download, Semester 2 - download;

Year 4, Semester 1 - download, Semester 2 - download.

Timetables Page

https://ahfs/timetable

Home | Profile | Timetables | Submit Grades | Student List | Personal Documents/Certificates

Specialization in Automatics and Applied Informatics (AIA):

Year 1, Semester 1 - download, Semester 2 - download;

Year 2, Semester 1 - download, Semester 2 - download;

Year 3, Semester 1 - download, Semester 2 - download;

Year 4, Semester 1 - download, Semester 2 - download.

Specialization in Computers with Instruction in Romanian (CR):

Year 1, Semester 1 - download, Semester 2 - download;

Year 2, Semester 1 - download, Semester 2 - download;

Year 3, Semester 1 - download, Semester 2 - download;

Year 4, Semester 1 - download, Semester 2 - download.

-The student will be able to check the grades for each subject, categorized by year of study.

Grades Page

https://ahfs/grades

Home | Profile | Timetables | Grades | Personal Documents | Certificates

Year I

Electrotechnics	Final Grade
Lab	Lab grade
Seminary	Seminary grade
Course	Course grade

Mathematical Analysis	Final Grade
Lab	Lab grade
Seminary	Seminary grade
Course	Course grade

Physics	Final Grade
Lab	Lab grade
Seminary	Seminary grade
Course	Course grade

Applied Informatics	Final Grade
Lab	Lab grade
Seminary	Seminary grade
Course	Course grade

Logical Design	Final Grade
Lab	Lab grade
Seminary	Seminary grade
Course	Course grade

CAD	Final Grade
Lab	Lab grade
Seminary	Seminary grade
Course	Course grade

-On the 'Submit Grades' page for the professors, they will be able to view their subjects and assign the grades after expanding the students list.

Grades Page

https://ahfs/grades

Home | Profile | Timetables | Submit Grades | Student List | Personal Documents/Certificates

Year I

Electrotechnics - Lab
Expand student list

Physics - Seminary
Expand student list

CAD - Course
Expand student list

-On the 'Personal Documents' page, as well on the 'Certificates' page, the students will be able to download the documents, and for the personal docs the students can also edit them.

Documents Page

https://ahfs/documents

Home | Profile | Timetables | Grades | Personal Documents | Certificates

Birth certificate	⬆	✎	🗑
ID	⬆	✎	🗑
Baccalaureate diploma	⬆	✎	🗑

Documents Page

https://ahfs/documents

Home | Profile | Timetables | Grades | Personal Documents | Certificates

Certificate	⬆
Certificate	⬆
Certificate	⬆

3.2   Hardware Interfaces

Not applicable.

3.3   Software Interfaces

DBMS: The faculty management system will interface with a RDBMS such as Microsoft SQL (version 2022) to store and manage data.

3.4   Communications Interfaces

Web browser:
- Support for HTTP (Hypertext Transfer Protocol) and HTTPS (HTTP Secure) for web communication.

Synchronization mechanisms:

- Support for bidirectional data synchronization to ensure consistency across platforms.
- Efficient use of resources to minimize synchronization latency and overhead.

Communication Standards:

- HTTP/HTTPS for web communication.

Synchronization Mechanisms: If the product involves synchronization of data between multiple devices or systems, requirements may include:

- Support for bidirectional data synchronization to ensure consistency across platforms.
- Efficient use of resources to minimize synchronization latency and overhead.

4.   System Features

4.1 Login

4.1.1 Description and Priority

Priority: High

Description: Users can authenticate into the application using a username and password provided by the faculty.

4.1.2 Stimulus/Response Sequences

Users input their username and password into designated fields and click the login button. Following these steps, users will be authorized based on their role and redirected to the corresponding home page.

4.1.3 Functional Requirements

REQ-1: Authentication Process: The system validates the entered username and password against the credentials provided by the faculty. If authentication fails, present an error message.

REQ-2: User Role Authorization: Upon successful authentication, identify the user's role and grant access to features and functionalities accordingly.

REQ-3: Redirect to Home Page: After successful authentication, direct the user to the home page.

4.2 Student Profile

4.2.1 Description and Priority

Priority: High
Description: The student can access its personal data by navigating to its profile.

4.2.2 Stimulus/Response Sequences
The student clicks on a profile button in the navigation bar and it is redirected to its profile.

4.2.3 Functional Requirements

REQ-4: Navigation Bar Interaction: When the student clicks on a button displayed in the navigation bar, it will be redirected to its student's profile.

REQ-5: Personal Information View: In the profile page the student can view its personal information: name, ID, age, gender, address.

REQ-6: Personal Information Modification: In the profile page the student can modify its
personal information: name, ID, age, gender, address. This action will notify an admin so he can review the modifications.

REQ-7: Student Information View: In the profile page the student can view its student information: year of study, faculty, class and group enrolled

4.2 Teacher Profile

4.2.1 Description and Priority
Priority: High
Description: The teacher can access its personal data and personal documents uploaded by navigating to its profile.

4.2.2 Stimulus/Response Sequences
The teacher clicks on the profile button displayed on the navigation bar and it is redirected to its personal profile.

4.2.3 Functional Requirements

REQ-8: Navigation Bar Interaction: When the teacher clicks on a button displayed in the navigation bar, it will be redirected to its student's profile.

REQ-9: Personal Information View: In the profile page the teacher can view its personal information: name, ID, age, gender, address.

REQ-10: Personal Information Modification: In the profile page the teacher can modify its
personal information: name, ID, age, gender, address. his action will notify an admin so he can review the modifications.

REQ-11: Teacher Information View: In the profile page the teacher can view the following information: subjects taught, faculties in which he is active in the university, class to whom he is the tutor (if any).

4.3 Student Timetable View

4.3.1 Description and Priority
Priority: High

Description: The student can access a timetable list where all current timetables are uploaded ordered by profile and year of study.

4.3.2 Stimulus/Response Sequences

The student clicks on a timetable button in the navigation bar and it is redirected to the page where the timetables are uploaded. From there he can click on any of the timetable options.

4.3.3 Functional Requirements

REQ-12: Navigation Bar Interaction: When the student clicks on a button displayed in the navigation bar, it will be redirected to the timetables page.

REQ-13: Timetable Display: After selecting a timetable, the application should display a document with a schedule, including details such as course names, teachers, locations, and times.

REQ-14: Timetable Download: After selecting a timetable, the user will have an option to download the displayed document.

4.4 Teacher Timetable View

4.4.1 Description and Priority
Priority: High
Description: The teacher can access a timetable list where all current timetables are uploaded ordered by profile and year of study.

4.4.2 Stimulus/Response Sequences

The teacher clicks on a timetable button in the navigation bar and it is redirected to the page where the timetables are uploaded. From there he can click on any of the timetable options.

4.4.3 Functional Requirements

REQ-15: Navigation Bar Interaction: When the teacher clicks on a button displayed in the navigation bar, it will be redirected to the timetables page.

REQ-16: Timetable Display: After selecting a timetable, the application should display a document with a schedule, including details such as course names, teachers, locations, and times.

REQ-17: Timetable Download: After selecting a timetable, the user will have an option to download the displayed document.

4.5 Student Grades View

4.5.1 Description and Priority
Priority: High
Description: The student can access a page containing his particular grades for each subject from current year and past years. The student has also the option to download a document containing all his grades per that year.

4.5.2 Stimulus/Response Sequences
The student clicks on a "grades" button in the navigation bar and it is redirected to the page where the grades are displayed. From there they can click a download button to get a document containing the grades per year selected

4.5.3 Functional Requirements

REQ-18: Laboratory grade: For each subject (where applicable),display final laboratory grade

REQ-19: Seminary grade: For each subject (where applicable),display final seminary grade

REQ-19: Course grade: For each subject ,display final course grade

REQ-20: Final subject total grade: For each subject, calculate and display the final grade.

REQ-21: Final semester grade: For each semester ,display the final grade for that semester.

4.6 Teacher Grades Submit

4.6.1 Description and Priority
Priority: High
Description: The teacher can access a page where they can enter a grade for each student individually - only for subjects assigned to them

4.6.2 Stimulus/Response Sequences
The teacher clicks on a "submit grades" button in the navigation bar and they are redirected to a page where they can see the subjects assigned to them and the students assigned to that subject.
Next to each student is a field where the teacher can enter the grade.

4.6.3 Functional Requirements

REQ-22: Subjects assigned view: Each subject assigned to that teacher will be displayed on the page.

REQ-23: Student list per subject view: For each subject assigned there is a list of students that have that subject assigned.

REQ-24: Grade submission: For each student the teacher can submit a grade

4.7 Student Document Upload

4.7.1 Description and Priority
Priority: High
Description: The student can upload within the application personal documents, including their birth certificate, ID, baccalaureate diploma and profile picture.

4.7.2 Stimulus/Response Sequences
The student can upload personal documents by accessing a designated section within the application.

4.7.3 Functional Requirements

REQ-25: Document Upload Feature: Implement a dedicated feature within the application that allows students to upload personal documents, such as birth certificates, IDs, and baccalaureate diploma.

REQ-26: Supported Document Formats: Support PDF or JPEG formats for upload.

4.8 Teacher Document Upload/Edit

4.8.1 Description and Priority
Priority: High
Description: The teacher can upload within the application personal documents, including their birth certificate, ID, and baccalaureate, university, master, doctorate diploma and profile picture

4.8.2 Stimulus/Response Sequences
The teacher can upload personal documents by accessing a designated section within the application.

4.8.3 Functional Requirements

REQ-27: Document Upload Feature: Implement a dedicated feature within the application that allows teachers to upload personal documents, such as birth certificates, IDs, and baccalaureate diploma.

REQ-28: Supported Document Formats: Support PDF or JPEG formats for upload.

4.9 Document View

4.9.1 Description and Priority
Priority: High
Description: The student and teacher can view their personal documents within the application, including uploaded items such as their birth certificate, ID, and baccalaureate diploma, for reference and verification purposes.

4.9.2 Stimulus/Response Sequences
The student and teacher can view their personal documents by navigating to a dedicated section within the application.

4.9.3 Functional Requirements

REQ-29: Document Viewing Feature: Implement a dedicated feature allowing students and teachers to view their personal documents within the application.

REQ-30: Document Categories: Categorize personal documents into distinct sections, such as identification, educational records, or certificates, to enhance organization and ease of access.

REQ-31: Document Details: Display comprehensive details for each uploaded document, including document type, upload date, and any additional information relevant to the document's purpose.

4.10 Certificates View

4.10.1 Description and Priority
Priority: High

Description: Students and teachers can view their student/teacher certificates within the application.

4.10.2 Stimulus/Response Sequences
The teacher/student clicks on a "certificates" button in the navigation bar and they are

redirected to a page where they can see and download user specific certificates provided by the faculty.

      4.10.3 Functional Requirements

      REQ-32: Certificates Viewing Feature: Implement a dedicated feature allowing students and teachers to view certificates within the application.

      REQ-33: Certificate Download: Allow students and teachers to download their certificates provided by the faculty.

4.11 Teacher Subjects Overview

      4.11.1 Description and Priority
      Priority: High
      Description: The teacher can access and view a list of subjects they are assigned to teach within the application

      4.11.2 Stimulus/Response Sequences
The teacher can view the subjects list by selecting a designated option within the application

      4.11.3 Functional Requirements

      REQ-34: Subjects List Viewing Feature: Implement a dedicated feature that allows teachers to view the list of subjects they are assigned to teach within the application.

      REQ-35: Subject Details: Display comprehensive details for each subject in the list, including the subject name, class or course and any other relevant information.

4.12 Teacher Classes Overview

      4.13.1 Description and Priority

      Priority: High
      Description: The teacher can access and view its classes within the application, allowing them to review information about the classes they are assigned to teach.

      4.12.2 Stimulus/Response Sequences
      The teacher navigates to the class's view feature by selecting a designated option within the application.

      4.12.3 Functional Requirements

REQ-36: Classes View Feature: Implement a dedicated feature that enables teachers to access and view information about the classes they are assigned to teach within the application.

REQ-37: Class Details: Display comprehensive details for each class in the view, including the class name, course or subject, schedule and any other pertinent information.

4.13 Teacher Students Overview

4.13.1 Description and Priority
Priority: High
Description: The teacher can access and view all its students within the application, providing them with comprehensive information about the students enrolled in their classes.

4.13.2 Stimulus/Response Sequences
The teacher navigates to the students view feature by selecting a specific option within the application.

4.13.3 Functional Requirements

REQ-38: Students View Feature: Implement a dedicated feature that allows teachers to access and view information about the students enrolled in their classes within the application.

REQ-39: Student Details: Display comprehensive details for each student in the view, including the student's name, contact information, academic performance, and any other relevant information.

REQ-40: Filter Criteria: Implement filter criteria such as student name, on the year when the student was enrolled, year of study, graduation year, specialization and

subject or any other relevant parameters that enable the teacher to refine and tailor the student list.

REQ-41: Performance Metrics: Include information on each student's academic performance, attendance records, and any relevant assessments

4.14 Admin Students Overview

4.14.1 Description and Priority
Priority: High
Description: Administrators can view and manage student information based on various criteria, offering a comprehensive overview for efficient administrative tasks.

4.14.2 Stimulus/Response Sequences
The administrator navigates to the students overview feature by selecting a specific option within the application.

4.14.3 Functional Requirements

REQ-42: Year-Based Filtering: Allow administrators to filter and view students based on the year they were enrolled, providing an organized structure for managing student data.

REQ-43: Year of Study Filtering: Implement a filtering option for administrators to view students based on their current year of study, facilitating academic tracking and administrative planning.

REQ-44: Specialization Filtering: Include a specialization filter, enabling administrators to view students based on their chosen academic specialization or major.

REQ-45: Subject-Based Filtering: Implement a filter that allows administrators to view students based on the subjects they are enrolled in, aiding in subject-specific administrative tasks.

REQ-46: Student Details Display: Ensure that the overview displays comprehensive details for each student.

4.15 Admin Teachers Overview

4.15.1 Description and Priority
Priority: High
Description: Administrators can efficiently manage and view information about all teachers based on their specialization and the subjects they teach.

4.15.2 Stimulus/Response Sequences
The administrator navigates to the teachers overview feature by selecting a specific option within the application.

4.15.3 Functional Requirements

REQ-47: Specialization-Based Filtering: Allow administrators to filter and view teachers based on their students academic specialization or major, providing a streamlined approach to managing teacher resources.

REQ-48: Subject-Based Filtering: Implement a filtering option for administrators to view teachers based on the subjects they teach, facilitating subject-specific administrative tasks and resource allocation.

REQ-49: Teacher Details Display: Ensure that the overview displays comprehensive details for each teacher.

4.16 Admin Data and Profile - Create, Delete and Update

4.16.1 Description and Priority
Priority: High
Description: Administrators can update personal data for both students and teachers within the application and can create and upload documents.

4.16.2 Stimulus/Response Sequences
The administrator navigates to the update information feature by selecting a specific option within the application.

4.16.3 Functional Requirements

REQ-50: Student Data Update: Implement a feature that allows administrators to update personal data for students, including but not limited to names, contact information, and enrollment details.

REQ-51: Teacher Data Update: Provide the capability for administrators to update personal data for teachers, encompassing details such as names, contact information, and academic qualifications.

REQ-52: Documents: Provide the capability for administrators to update, upload and download all of certificate documents and personal documents

REQ-53: Create Student Profile: Provide the capability for administrators to create students' profiles.

REQ-54: Create Teacher Profile: Provide the capability for administrators to create teachers' profiles.

REQ-55: Delete Student Profile: Provide the capability for administrators to delete students' profiles.

REQ-56: Delete Teacher Profile: Provide the capability for administrators to delete teachers' profiles.

5.   Other Nonfunctional Requirements

5.1   Performance Requirements

Response time: The application shall respond to user queries within 5 seconds.

Page load time: Pages shall fully load all elements within 5 seconds.

Concurrent user handling: The application will support a minimum of 100 concurrent users without significant deterioration in performance. The application must efficiently manage user requests to guarantee seamless navigation and interaction, regardless of the volume of simultaneous users.

5.2   Safety Requirements

Not applicable.

5.3   Security Requirements

User Authentication and Authorization: The application implements strong user authentication methods so that only validated users can access sensitive data and functionalities. Different users can access different information depending on their user role: student, teacher or administrator.

Passwords requirements: Passwords are alphanumeric and must be at least 10 characters in length, must have at least 1 uppercase letter, 1 lowercase letter, 1 special character and 1 number.

Password storage: Only the hash of the user passwords will be stored on the web server.

Secure communication: Communication between the client and web server will be encrypted.

Data encryption: Sensitive data, such as personal information, will be stored in encrypted form.

5.4   Software Quality Attributes

We'll comply to the following rules and best practices:

1. All function body code (such as if, for, else, etc) shall be contained within curly brackets.
2. Function bodies shall not be empty. If a function body is left empty, the developer will write a comment inside the function body with a short explanation.
3. All if statements shall have an else statement defined and all if else if statement chains shall end in an else statement.
4. There shall be no unreachable code.
5. Every switch statement shall have at least one case clause.
6. camelCase shall be used for local variables, function parameters and method names.
7. PascalCase shall be used for class.
8. Variable names will be distinct and explicit.
9. Variable names shall not include abbreviations.
10. Curly brackets shall be vertically aligned.
11. Interface names shall be prefixed with the letter I.
12. Values shall not be hardcoded.

13. Sections of code shall not be commented out.
14. Multi-line comments shall not be nested. Single-line comments can be nested inside of multi-line comments.
15. All member variables shall be declared at the top of a class.

5.5   Business Rules

Not applicable

6.   Other Requirements

Not available

Appendix A: Glossary

SRS - Software Requirements Specification: A description of a software system to be developed.

AHFS - Automatic Handling for Faculty Students: Name of the project.

ID - Identity Document: A document used to prove a person's identity.

OS - Operating system: System software that manages computer hardware and software resources, and provides common services for computer programs.

LTS - Long-Term Support: A product lifecycle management policy in which a stable release of computer software is maintained for a longer period of time than the standard edition.

SSMS - SQL Server Management Studio: A software application developed by Microsoft that is used for configuring, managing, and administering all components within Microsoft SQL Server.

SQL - Structured Query Language: a standard language for database creation and manipulation.

DBMS - Database Management System: A software system used to store, retrieve and run queries on data.

RDBMS - Relational Database Management System: A DBMS used to maintain relational databases.

PDF - Portable Document Format: A file format developed to present documents, including text formatting and images, in a manner independent of application software, hardware, and operating systems.

HTTP - Hypertext Transfer Protocol: An application layer protocol designed to transfer information between networked devices.

HTTPS - Hypertext Transfer Protocol Secure: An extension of HTTP. It uses encryption for secure communication over a computer network, and is widely used on the Internet.

JPEG - Joint Photographic Experts Group: A commonly used method of lossy compression for digital images.

GPU - Graphics Processing Unit: A specialized electronic circuit designed to accelerate computer graphics and image processing.

Appendix B: Analysis Models

Not applicable.

Appendix C: To Be Determined List

Not applicable.