

LAB SECURITY SYSTEM

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Abstract- Labs security system help on control university labs access and monitoring student and instructor authentication to access lab depend on labs schedule (course time) and allow access only for course student. This system will give us solution to insure that only authorized person can access to university labs. Our system gives us choice to control lab access status and determine lab access schedule. This system will insure that labs used from allowed user only and depend on lab usage. Finally, this system enables the doctors in controlling the number of absence for every student registered in the doctor course.

Keywords-Security, Magnetic Stripe Card Reader

I. INTRODUCTION

Security means to keep something safe. We need security for everything in our everyday life to live better and safe life and to avoid vandalism.

We propose this project (lab security system) to make the faculty labs more secure for the persons who should be the only one who can get into labs. This is to make everything safe for the university to make sure there is no sabotage from some persons and be sure who will get into that labs and be known from the university and make everything better than before.

In this research, we proposed labs security system to provide labs access authentication in AlZaytoonah University. This system will control all access operation in labs it also helps to avoid overload in using labs computer in free time. Our system insure that only authenticate student can access to labs depending on labs lecture schedule. Labs supervisor can stop all access authentications in Maintenance session. This system will increase labs efficiency and security it also help instructor to take student absence in lecturers.

We used the Microsoft Visual Studio.Net 2010 (ASP programming). ASP.NET uses multiple languages in the same project. In previous versions of Visual Studio it was complex, where it's very difficult to merge more than one language in the same project, but this version has made it very simple. ASP.NET has possibility of merging the page and the code file. Their importance that, in some cases, the developer does not need a file full of code, so that there will be a lot of code modules (code blocks). The ASP.Net has Automatic

translation of the code files. And can Inheritance from the Master Page.

We used the SQL language to managing system database entirely with all standard operations. These operations include: creating tables, insert data to tables, build queries to display, delete, update the tables. Also establish the connection between the various tables.

II. BUSINESS MODEL

This system “aims to help students in universities, institutes and Colleges to facilitate the educational process and increase its efficiency it also enhances security level.

The most important weaknesses in the previous traditional system are:

- Difficult to use.
- Impossible to check if students register in course or not.
- Lack of knowledge of student with checking the absence.
- Less secure.

A. Project Scope

This system contain level security for checking if the user(student, teacher) authorized to access specific lab depending on lab course schedule or lab rate of usage in free time. It Also enables to edit lab status in maintenance session to lock to the lab access in section and to avoid over load in it lab by enabling access to specific number to access lab in the same time.

B. Project Objectives

We aim to control all access to the university labs through security labs system also:

- 1- Accepts student access depending on lab schedule (only registered student can access in the course session).
- 2- Accepts student access to labs in free time depending on labs load (number of PC).
- 3- Return reports about course absence to the course instructor.
- 4- Insures that labs are empty in maintenance session.
- 5- Return statistics about labs usage.

C. Motivations

The main reason for selecting this project as a graduation project is because it will help the lab supervisors in monitoring faculty labs and give the administrator a clear reading for a lab usage. The system also allows the administrator of faculty labs to control lab access for specific person and reaches the restricted place. This system will give us power to control lab access.

D. Stakeholder Analysis

Table (1) shows the stakeholders in lab security.

Table (1): stakeholder analysis

Stakeholder Name	Role in Project
Admin	The control of any task in the system Lab info User info View report0
Teacher	check of course and View absent
Lab supervisor	Change lab status in maintenances session
Student	Access labs

E. Enviroment

Our system needs many tools such as: Microsoft Visual studio.net; SQL Server 2008; Visio 2010; Rational Rose Enterprise Edition 200; and SMART DRAW 2010. ALSO OUR SYSTEM NEEDS Hardware such as: Magnetic Stripe Card Reader (Encoders) Msr505c; Laptop or pc.; and Server in university.

F. Project Management

Figure (1) shows the project iteration schedule (Gantt chart) to describe the Project iteration schedule.

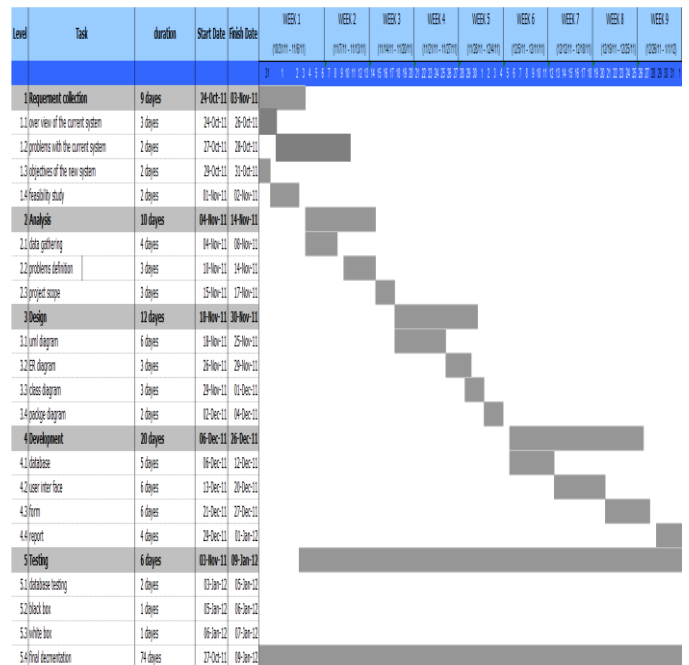


Figure (1): Project iteration schedule (Gantt chart)

During the phase of system design and implementation we needed specific software and hardware. Software components includes : Microsoft Visual Studio.Net2010; SQL Server 2008; and Windows Operating System. Hardware equipment includes Laptop or personal computer .

The cost of designing and maintaining the application is really reasonable and compatible with the budget. As the new application is expected to improve the learning efficiency and increase the teaching speed. Table (2) describes the overall project cost.

Table (2): Project overall cost

Number	Tool Name	Price
1	Magnetic Card Reader	365\$
2	Visio Microsoft 2010	999\$
3	Microsoft Visual Studio 2010	74\$
4	SQL 2008 R2	733\$
5	50 Magnetic Cards	75\$
TOTAL		2646\$

To examine how effective this system will be with the provided services in the university. Figure (1) represents the Gantt chart of the operational feasibility. The system requirements such as software and hardware. For programming the system: Microsoft Visual Studio 2010.net (ASP.NET); SQL 2008 R2; Visio 2010; and Rational Rose Enterprise Edition 2003. Whereas Hardware includes Magnetic Stripe Card Reader/Writers (Encoders) Msr505c. Figure (2) shows the device we want to use it. It is more suitable than the other devices according to its lower price (100J.D); Laptop or pc and Server in university.



Figure (2): Magnetic Stripe Card Reader/Writers

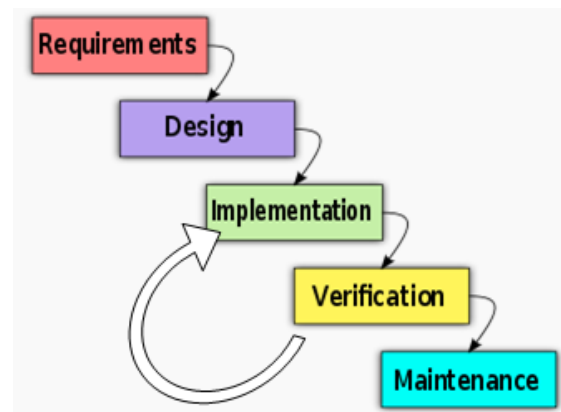


Figure (3): Water Fall Model

III. SYSTEM PLANNING AND ANALYSIS PHASES

In this chapter we discuss all step we do as a work team to collect the system requirement starting with data gathering, then finally analyzing this requirement to reach stakeholder requirement as shown in the following section.

A. Data Gathering

The first phase of our project is to collect project requirement for proposed system. This phase is required to meet lab supervisor and find needs from security system control lab access. Then we observe student access to university labs and we determine the main problems of labs management. We put a plan to analyze the data we collect to find the main requirement for our system.

B. Requirement analysis

Through using the data we gathered for the proposed system we found the main requirements that insure us to meet our objective we determine in the previous step. This step gives as the main process that must be included in this system to reach system scope. This requirement we described it in the specific section with name system requirements.

C. Project life cycle

We used object oriented model in project life cycle (flow chart model). The Waterfall model is a sequential design process, often used in software development processes, in which progress is seen as flowing steadily downwards (like a waterfall) through the phases of Conception, Initiation, Analysis, Design, Construction, Testing, Production/ Implementation and Maintenance. Figure (3) shows the project system life cycle.

D. Functional Requirements:

- 1- Manage university labs
- 2- Manage Labs schedule
- 3- Check student access
- 4- View statistic about labs usage
- 5- Block labs for maintenances session
- 6- View student absence in lecture
- 7- accept/Reject user access to labs (labs limitation)
- 8- Manage system user

E. Non Functional Requirements:

- Security: This step accepts access to authorized student and leaders for the university lab through user magnetic card and depends on labs schedule and usage.
- Usability: This system insures that all the system process is done in a simple way without complexity or ambiguity.
- Readability: it depends on the system schedule and total student in lab system accept or reject user accept also return report about each lab.

In this chapter we discuss system analysis base that start with data gathering then analysis data to reach final requirement for graduation system. Figure (4) shows the system class diagram.

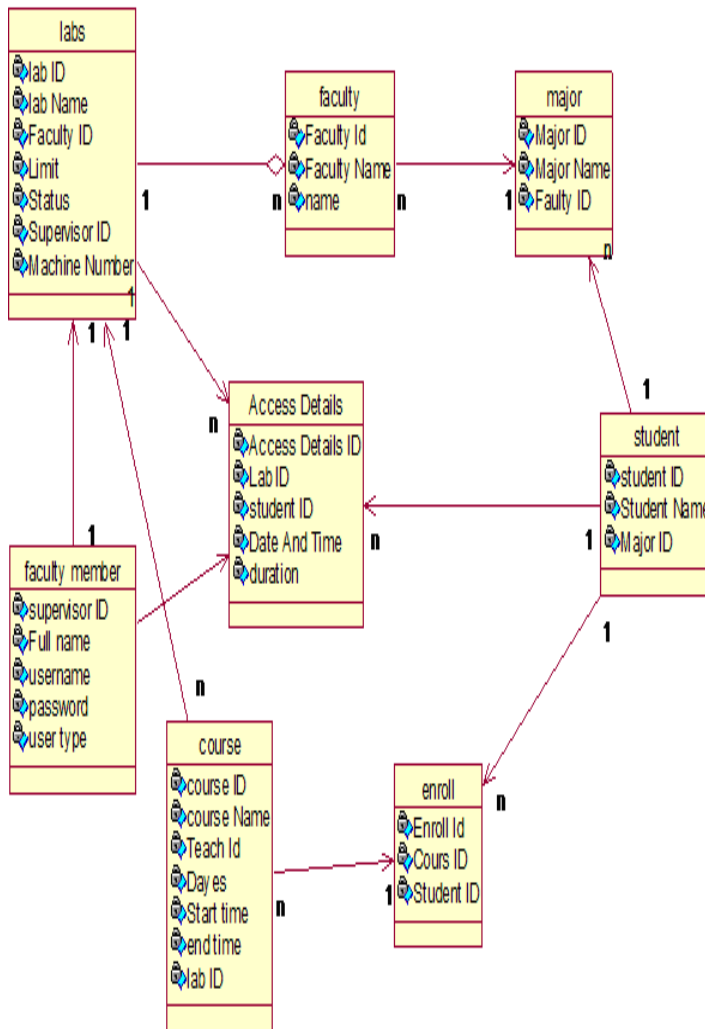


Figure (4): System class diagram

IV. SYSTEM DESIGN PHASES

This section contain description for requirement design model that describe system process phase and dependency between system process and each other. Table (3) describes event for each processing system.

Table (3): Event table (Admin)

Event	Source (external actor)	Trigger (data that actors send)	Use Case (process)	Response	Destination
control university labs	Admin	Lab info	Manage labs	Confirm management	Admin
control Labs schedule	Admin	Course on labs date time	Manage schedule for labs	Return schedule	Admin
Check user access by Accept/Reject user access to labs (labs limitation)	All user	Magnetic ID	Check access	Accept or reject access	All users
View statistic about labs usage	Instructor	Duration date	Return access details	View labs access details	Instructor, And Admin
Block labs for maintenances session	Lab supervisor	Lab ID	Change lab status	Activate lab maintenance session	All students
View student absence in lecture	instructor	Date and course	Get student attend report	Absence report	Instructors
Manage system user	Admin	User info	Control user info	Confirm	Admin

The DFD models consists of many diagrams such as context diagram. Figure (5) describes users and their functions in the

lab security system. Figure (6) describes the use case diagram of the security lab system. Figure (7): describe the absence

activity to check access (accept or reject) . Figure (8) shows the class diagram of the system.

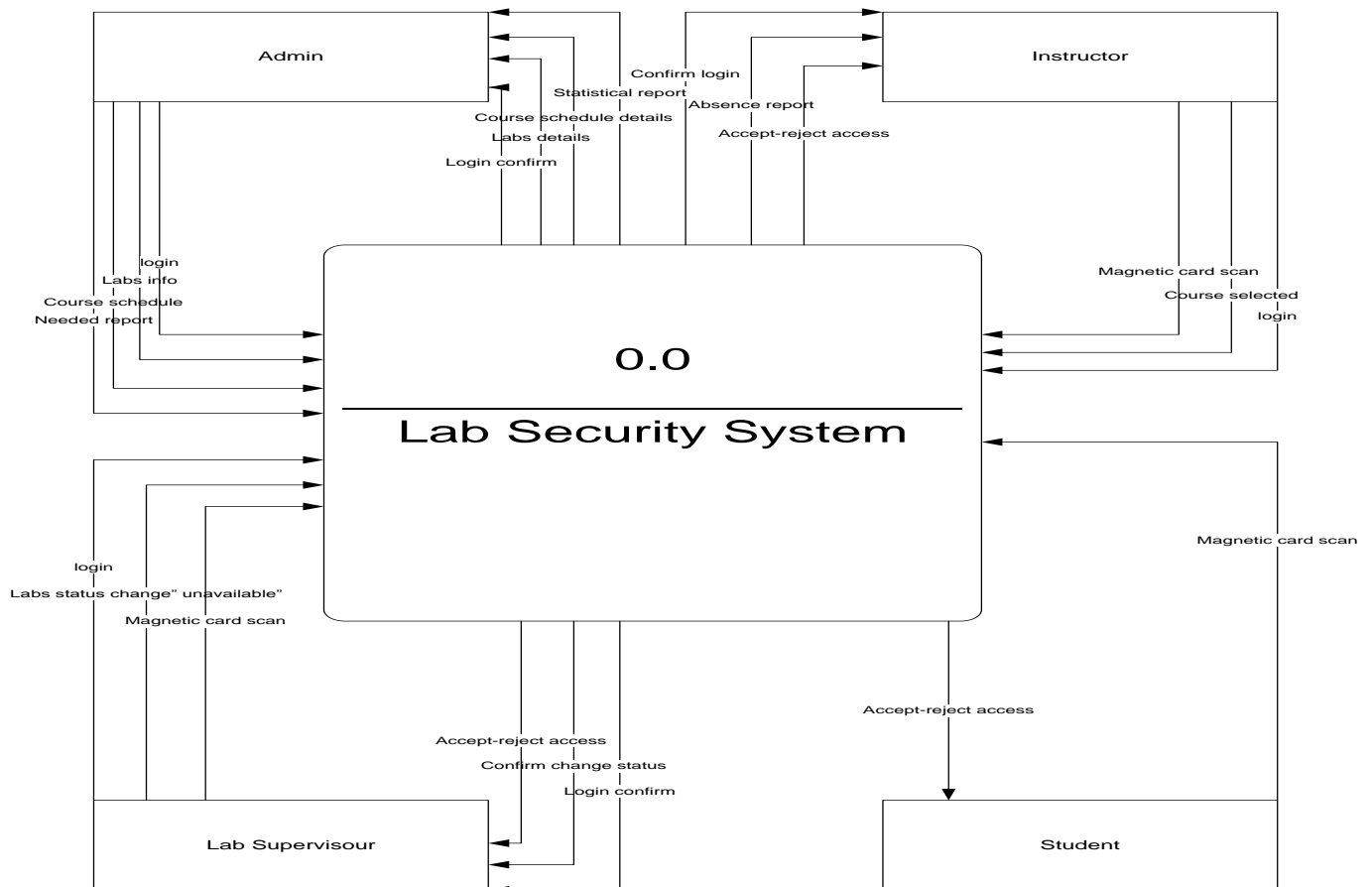


Figure (5): Describes users and their functions in the lab security system

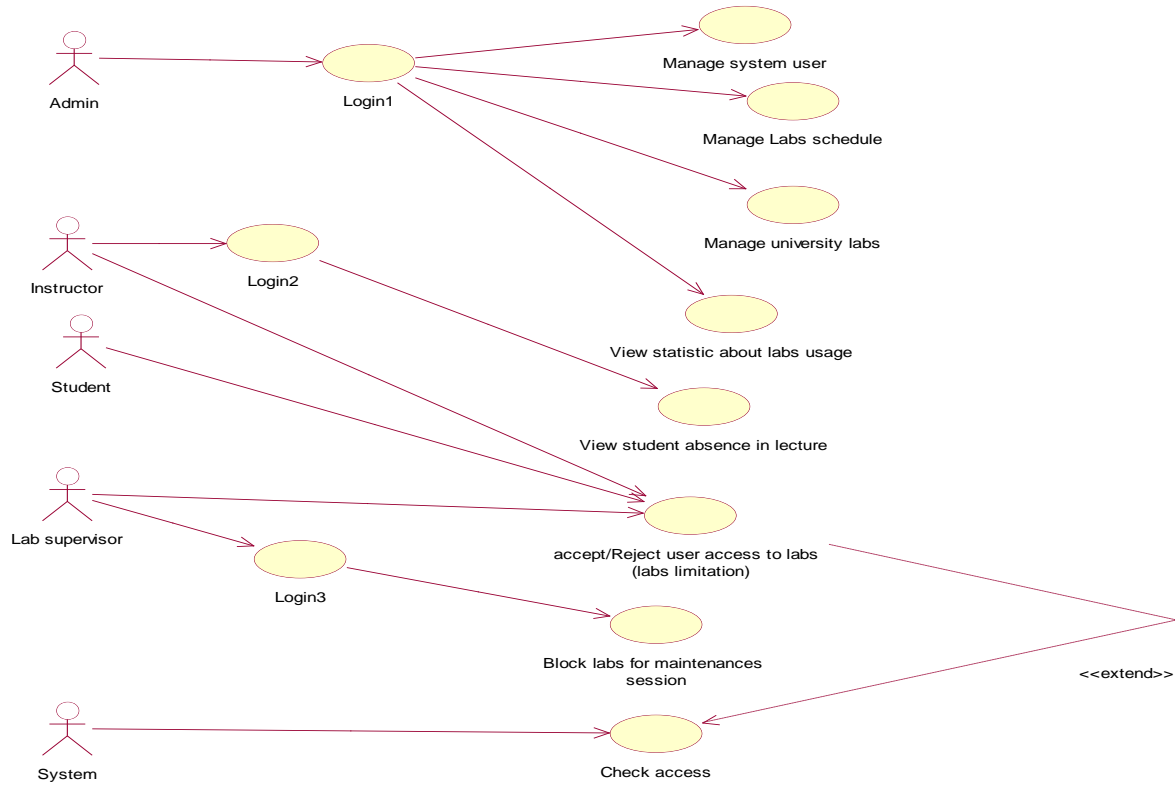


Figure (6): Use case diagram of the security lab system.

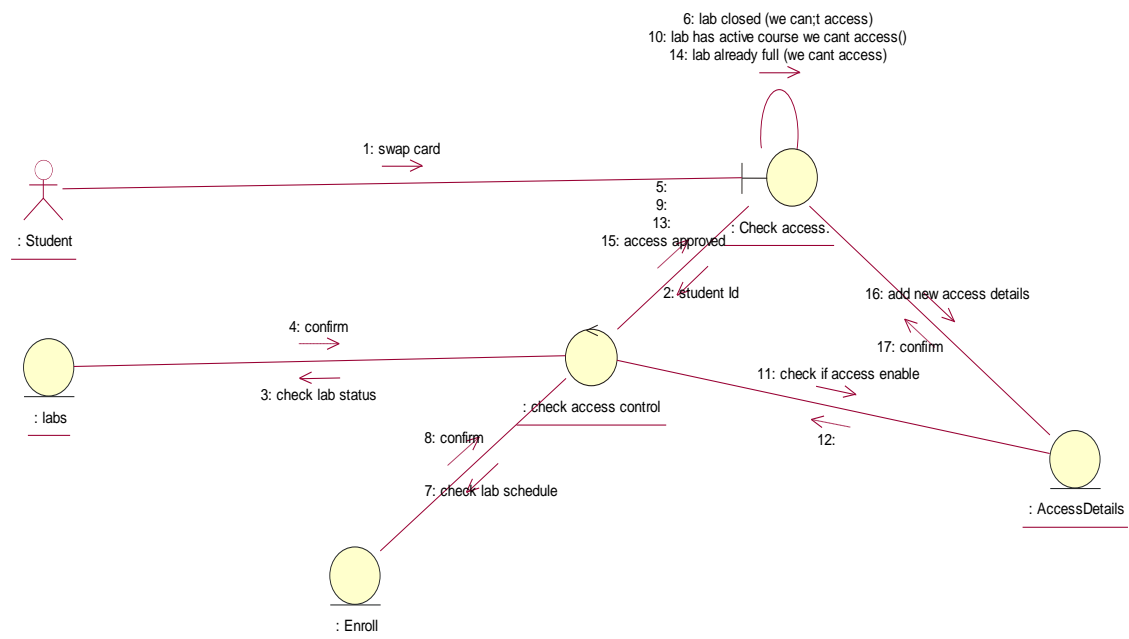


Figure (7): View absence activity

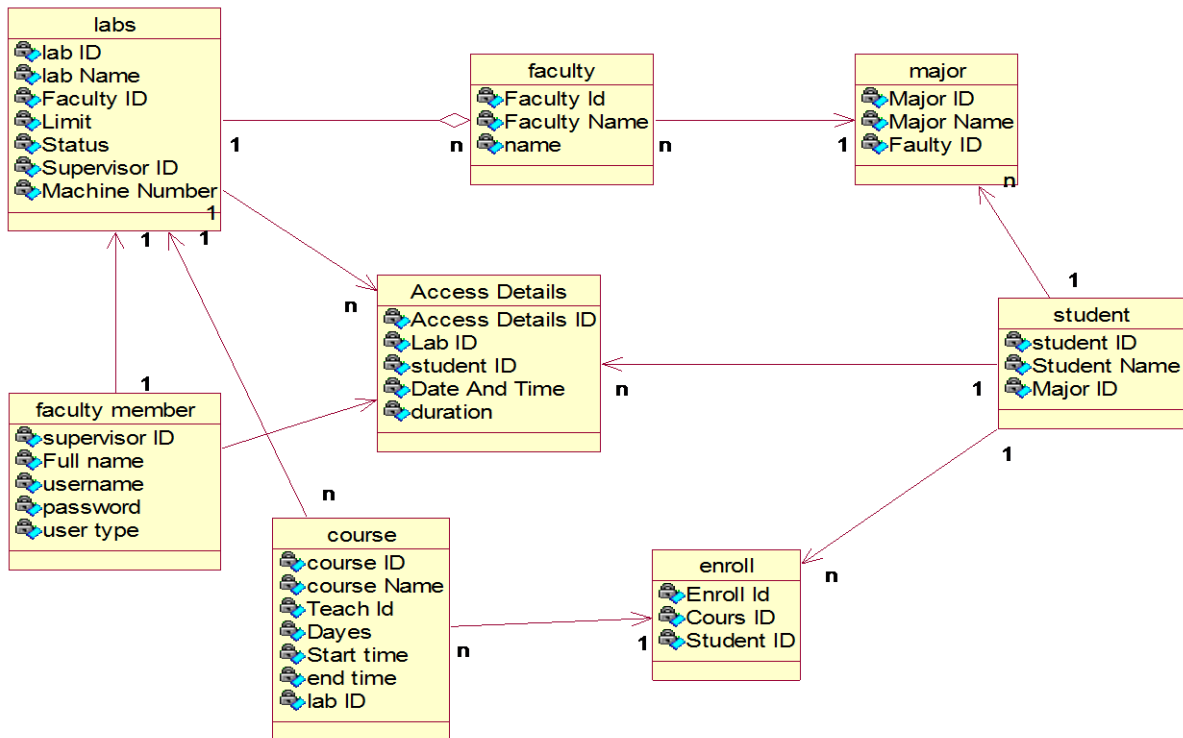


Figure (8): Class Diagram

Table (4) shows when the student can access the lab or not depend on the system requirements.

As execution of lib security system, we test the system many times. Figure (9) shows the absent and attendance and number of student in labs. And Figure (10) shows how the doctor build the report.

Table (4): student accessing the lab or not?

Lab full	Y	Y	Y	Y	F	F	F
Lab student lecture	Y	F	Y	F	Y	Y	Y
Lab maintenance	Y	Y	F	F	Y	Y	F
Access							X
Cant Access	X	X	X	X	X	X	

V. CONCLUSION

We submitted our graduation project: "lab security system" that controls AlZaytoonah labs which controls access and return reading about access detail for each lab. This system support decision maker to about adding new labs for specific field depend on lab usage.

Also this system implements the optimal solution to manage lab access and privacy of lab lecture. There is some processes that we hope to add to our system in near future and these processes are: Security alert for lab crack; and Convert check level to fingerprint.

ACKNOWLEDGMENT

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Figure (9) : shows how the instructor can print report after end lecture.

