Palestine Polytechnic University

College of Administrative Science and Informatics

Department of Information Technology

University Academics Support System

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This project was prepared to complete the requirements for graduation in Information Technology major in Palestine Polytechnic University-College of Administrative Science and Informatics

2005

- The University Academic Supporting System is a web based application.
- It can be run over the internet in a parallel and complementary manner within the academic (studying) operation in a university.
- Aims to serve and improve that operation and provide another new way of communication and interaction between the most important parts of the studying operation that are students, lecturers, and courses.

Problem Definition

According to

- the current evolution in the internet technology,
- our knowledge as university students of what is the most important academic issues that the students wants, and
- our technical knowledge as IT students of how to achieve these wants and requirements.

We found that it is a good idea to develop a university academic supporting system.

System Objectives and Importance

- Taking the main advantages of the E-Learning concept**?**
- Providing the students with a diverse collection of learning styles:
    - Different types of lectures materials (text, audio, or video),
    - Two types of questions (multiple choice questions and text questions),
    - A mechanism of contact with their lecturers**?**
- Enabling lecturers to
    - Contact with their students**?**
    - Evaluate their students' interaction and understanding**?**
- Providing any guest with
    - online lectures materials,
    - a collection of multiple choices questions**?**

System Functional Requirements

- Online course lectures**?**
- Course questions**?**
- Lecturers and students communication**?**
- Online advertisements**?**
- Administrator management controls on the system and users accounts**?**

System Non-Functional Requirements

- User friendly interface and ease of use**?**
- Flexibility**?**
- Availability**?**
- Security**?**
- Robustness**?**
- Cultural and political**?**
- Consistency**?**
- User guidance**?**
- User diversity**?**
- Learnability**?**

Specific system constrains

- User name must be unique**?** and represent the user's university number.
- Reregistered user only**?**
- Limited availability period online for some materials**?**
- The date format here is Month/Days/Year.

Cost Sums

- **Development stage costs:**

Requirements/Items	Total costs
Hardware Requirements**?**	$860
Software Requirements**?**	$810
Human Requirements**?**	$550
Total	**$2220**

- **Operational stage costs:**

Requirements/Items	Total cost
Hardware Requirements**?**	$5000
Software Requirements**?**	$2000
Human Requirements**?**	$800
Total	**$7800**

Time Schedule

Tasks	Process	Days(weeks)
T1	System planning and feasibility study	**2**
T2	Requirement collection and analysis	**2**
T3	System design	**3**
T4	Coding	**4**
T5	Implementation	**2**
T6	Testing	**2**
T7	Documentation	At each week

Total	15 weeks

System Implementation

Coding the system functions and requirements using:

- Visual Basic.Net programming language within the Visual Studio.Net environment that applying the ASP.NET technology.

Creating the system database using:

- SQL server 2000 enterprise edition.

System Testing

Used testing processes or types:

- Requirements-based testing**?**
- Integration testing**?**
- System testing**?**
- Acceptance testing**?**

System Maintenance

After the system installed in its operational environment, we will be able to know about:

- How to updating the system site contents**? ?**
- How to updating the system database**? ?**
- How to backup the system site contents**? ?**
- How to backup the system database**? ?**
- How to contact with the system developers**? ?**

Recommendations

Works and enhancements on the system:

- Building an exam application
    - Two questions types.
    - Governs with specific period of time.
- Communication between students and lecturers through the use of mail server exchanges.
- Providing new services in the system such as:
    - The ability of viewing the final students' results and marks.
    - Providing lectures in an audio and video conferencing form.

Also there are many others services and enhancements to be made on the system.

System Users Manual

- Student Manual.
- Lecturer Manual.
- Administrator Manual.
- Guest Manual.

This manual presented in questions form of (How?)

Ex. **How to add new lecture?**

Abstract

The University Academic Supporting System is a web based application, so it can be run over the internet in a parallel and complementary manner within the studying operation in a university; to serve and improve that operation and provide an another new way of communication and interaction between the most important parts of the studying operation; that are students, lecturers, and courses.

This system aims to improve the academic operation through providing many services to students and lecturers on their courses, such services; are providing the lecturers with different mechanisms to evaluate and improve their students' understanding and interacting with their courses; through providing them with different online lectures materials, different types questions, and the students ability of sending questions or notes to their lecturers.

Appendices

Appendix A:

- User Manual.

Appendix B:

- CD (Compact Disk)

Appendix A

User Manual

1. What is the University Academic Supporting System?

The University Academic Supporting System is a web based application, so it can be run over the internet in a parallel and complementary manner within the studying operation in a university to serve and improve that operation and provide an another new way of communication and interaction between the most important parts of the studying operation whom are students, lecturers, and courses.

This system aims to improve the academic operation through providing many services to the students and lecturers on their courses, such services as providing the lecturers with different mechanisms to evaluate and improve their students' understanding and interacting with their courses through providing them with different online lectures materials, different types questions and the students ability of sending questions or notes to their lecturers.

2. System Users Manual

This system has a four types of users each of them has a different privileges from other, these users are student, lecturer, administrator, and guest. So, this manual will be presented to each user according to its services that can take.

2.1 Guest Manual

Any guest to our system can enjoy many services; here you will be able to know:

- **How to Use this Page?**
- **How to View Lectures?**
- **How to Answer on Choice Questions?**
- **How to Send Notes on Site?**
- **How to View About Us?**
- **How to Login to your Account?**

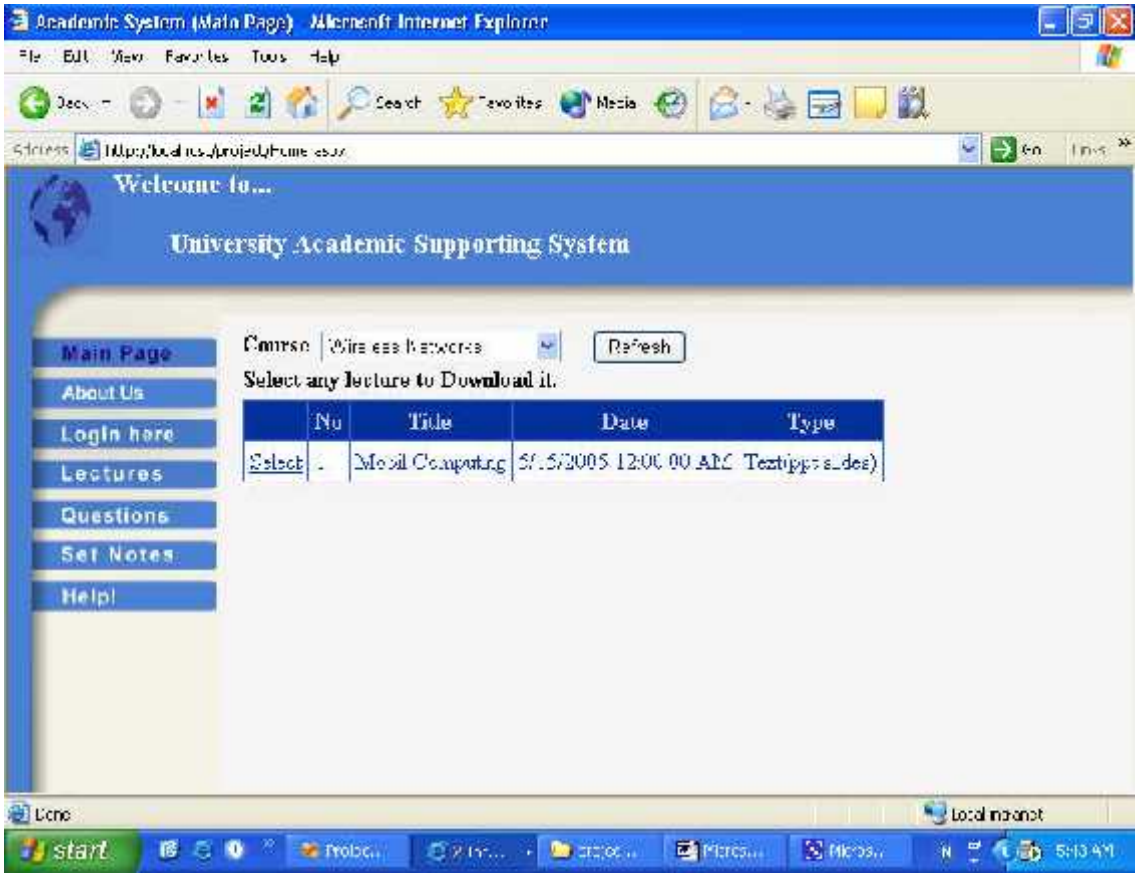
- **How to Use this Page?**

The main page has a menu with seven options links:

- Select the **"Main Page"** link to reset to the main page.
- Select the **"About Us"** link to view the about us information.
- Select the **"Login Here"** link to request the login page in order to login to your account.
- Select the **"Lectures"** link to view the available lectures materials and downloaded it.
- Select the **"Questions"** link to view choice questions page for answering on these questions.
- Select the **"Set Notes"** link to view the setting notes page in order to send notes on the site.
- Select the **"Help!"** link to view the available help materials.

- **How to View Lectures?**

Use the View Lectures form

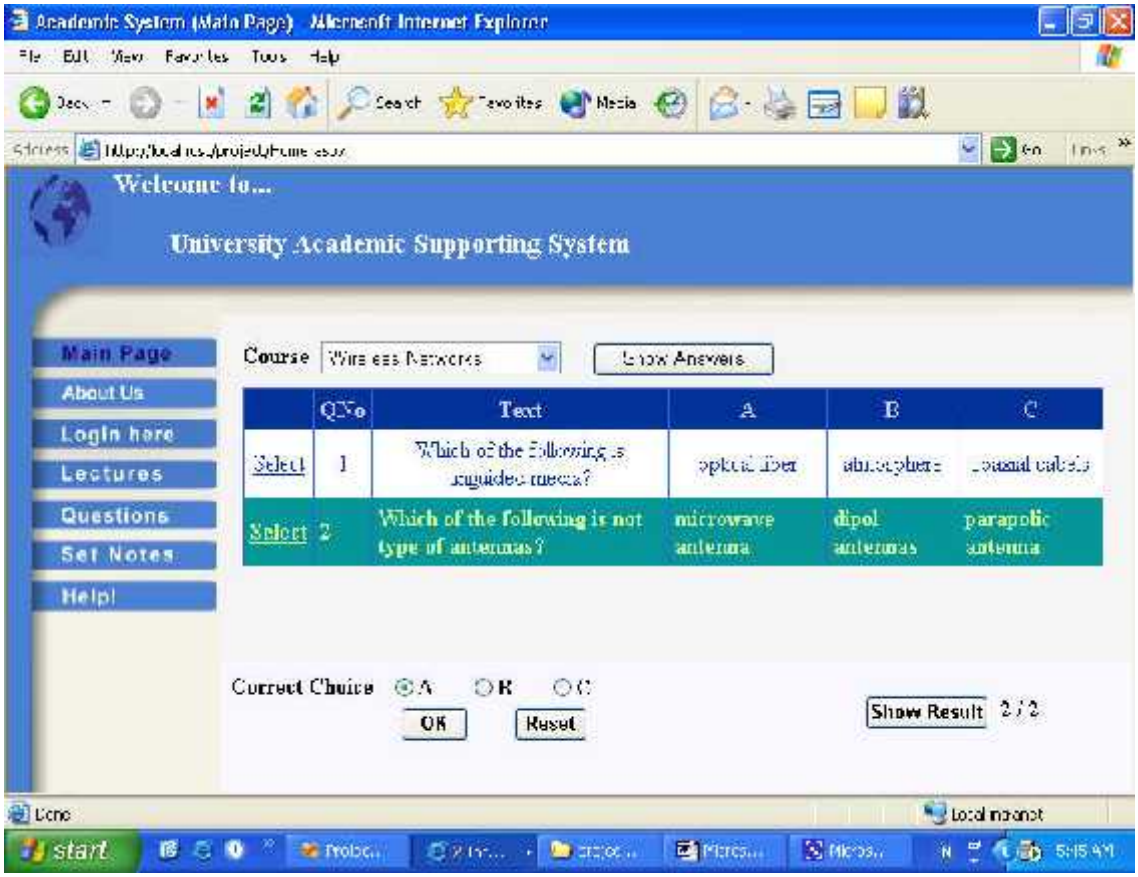


- Select a course from the **Dropdown List**. This is a required field.
- All available lectures data on the selected course will be displayed on the top part of this form.
- If you want to open any lecture select it by click on the **Select** button.
- The File Download dialog box will appear with its choices to open, save, or cancel. Click on **Save** button to download the file.

Note: the same way is to view other controls, such view advertisements, questions…

- **How to Answer on Choice Questions?**

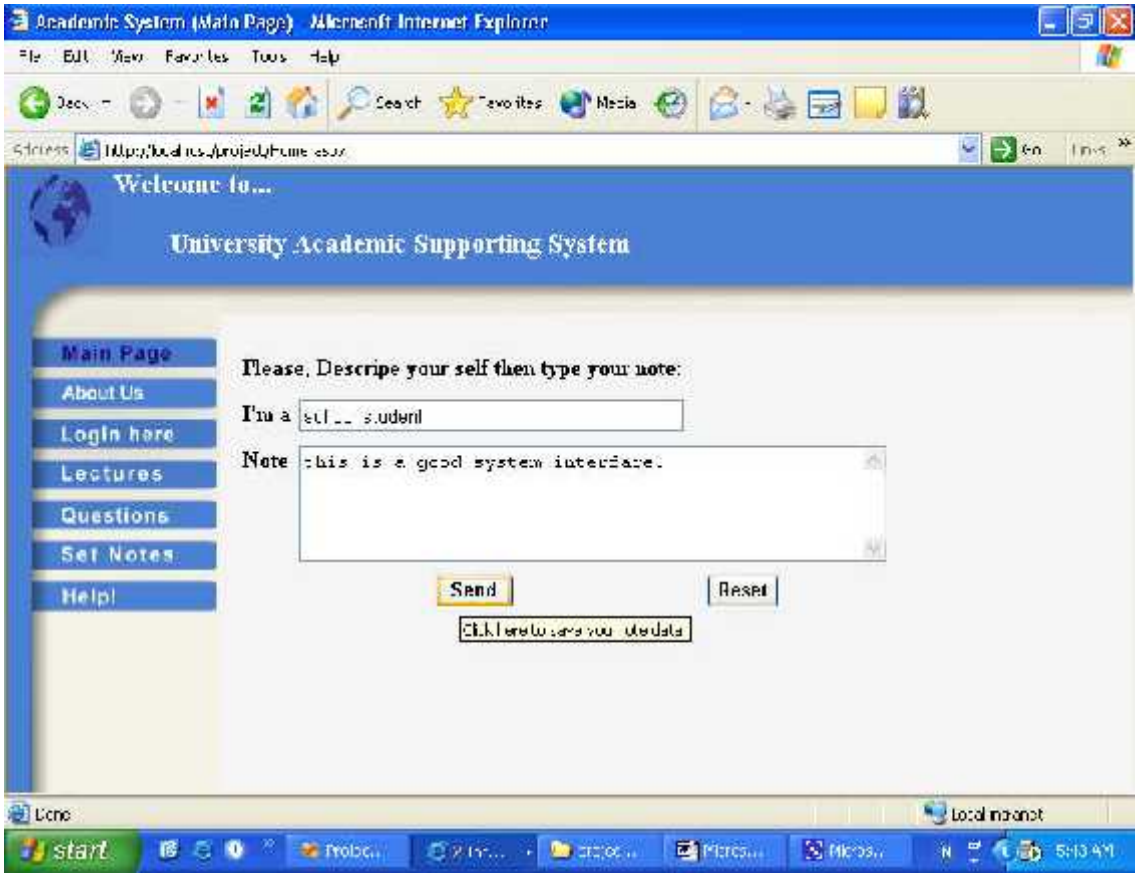
Use the Choice Questions form



- Select a course from the Dropdown List. This is a required field.
- All available questions data on the selected course will be displayed on the top part of this form.
- Click on the **Select** button to specify which question you want to answer on it.
- Choose the correct choice for the question by checked on one of the three **Correct Choice** radio buttons.
- Click on **OK** button to evaluate your choice and count your result.
- After answering on all questions or on any number of them you can click on **Show Result** button to show your result in the **Result** Label.
- Click on **Reset** button at any time to unchecked the correct choice radio buttons.
- Click on the show correct answers link to display the questions numbers and the correct choices on a separate new form.

- **How to Send Notes on Site?**

Use the Set Notes form.



- Enter briefly description about your self in the **"I'm a"** field. ,note that text must be less than or equal 100 characters. This is a required field.
- Enter your note text in the **Note** field, note that text must be less than or equal 1000 characters. This is a required field.
- Click on **Send** button to save your note data and send it to the site administration.
- Click on the "**Reset**" button to clear all fields' data.

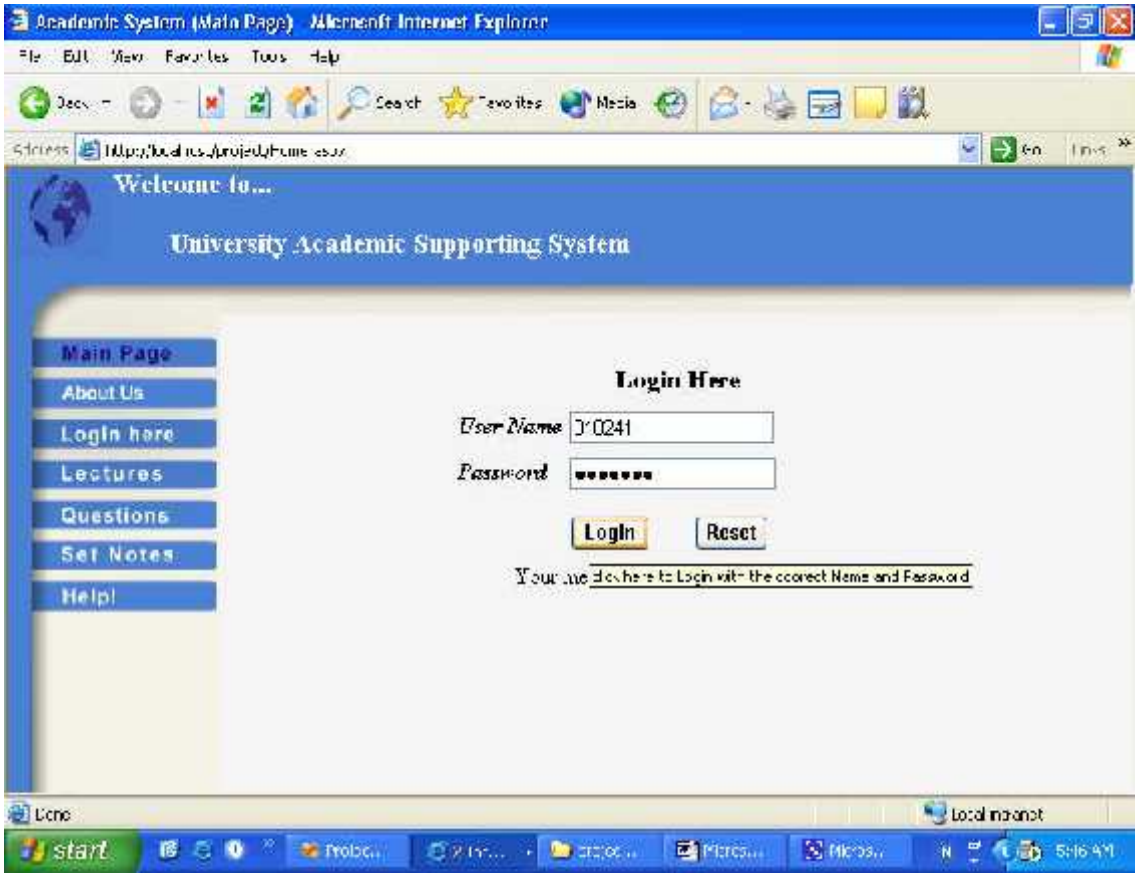
- **How to View About Us?**

Use the View About Us form

- Select the **About Us** link, then a page that contain description information about us will be displayed.

- **How to Login to your Account?**

Use the Login form



- Type your number in the **User Name** field. This is a required field.
- Type you password in **Password** field, This is a required field.
- Click on the **Login** button to login to your account page if you are authenticated.
- Click on the **Reset** button to clear all text fields.

2.2 Lecturer Manual

The lecturer on our system can enjoy many services; here you will be able to know:

- **How to Use this Page?**
- **How to Add Lectures?**
- **How to Delete Lectures?**
- **How to Add Advertisements?**
- **How to Add Text Questions?**
- **How to Update Text Questions?**
- **How to Evaluate Students Answers?**
- **How to Add Choice Questions?**
- **How to Update Choice Questions?**
- **How to Reply to Your Students?**
- **How to Change Your Password?**

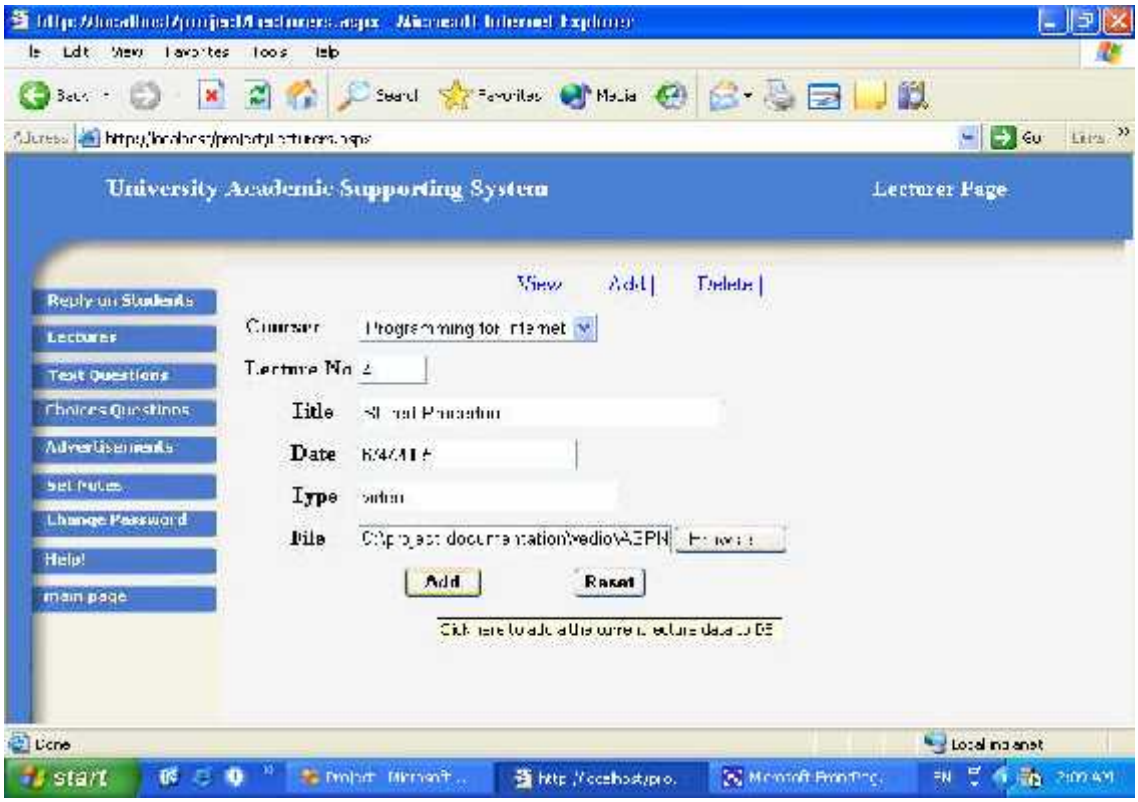
- **How to Use this Page?**

The lecturer page has a menu with nine options links:

- Select the **"Reply on Students"** link view the replying on students questions page.
- Select the **"Lectures"** link to view the lectures control page.
- Select the **"Text Questions"** link view the text questions control page.
- Select the **"Choices Questions"** link view the choice questions control page.
- Select the **"Advertisements"** link to view the advertisements control page.
- Select the **"Set Notes"** link to view the setting notes page in order to send notes on the site.
- Select the **"Change Password"** link to view the changing password page.
- Select the **"Help!"** link to view the available help materials on this page.
- Select the **"Main Page"** link to view the home (main) page.

- **How to Add Lectures?**

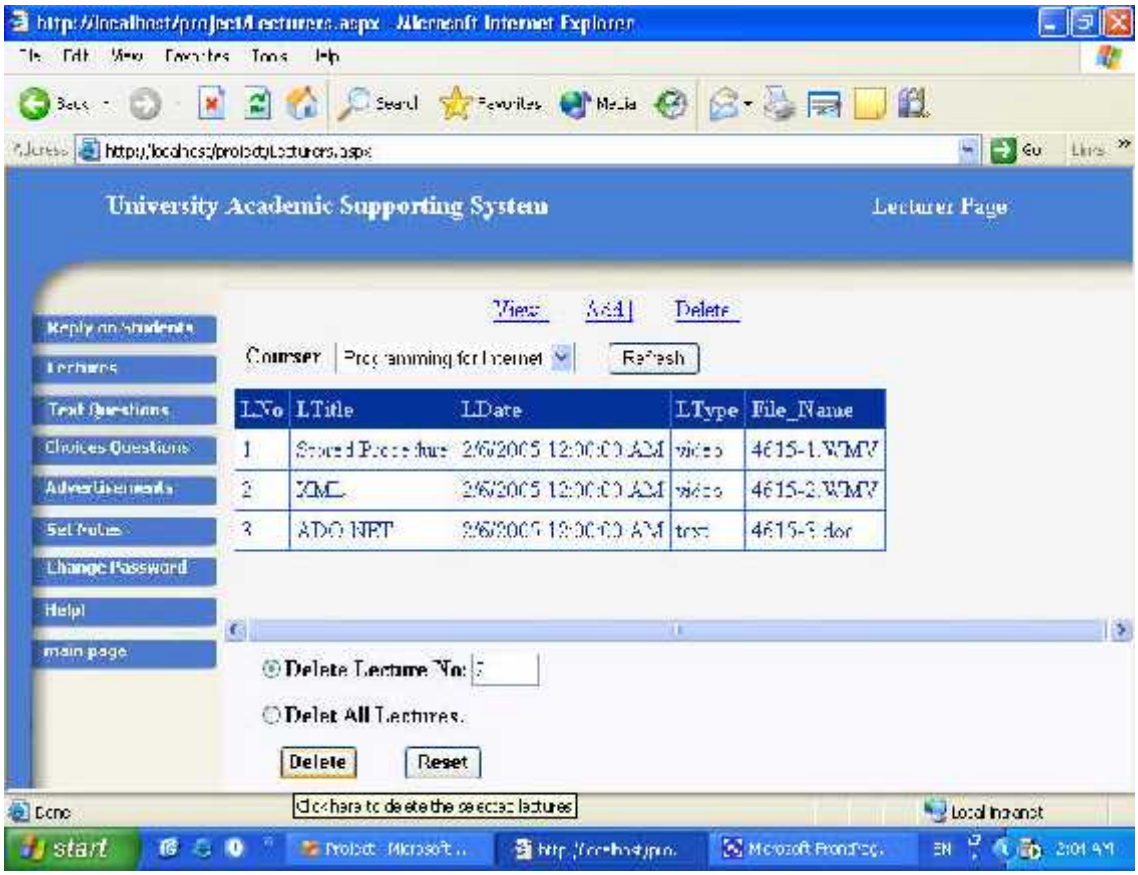
Use the Add Lectures form



- Select a course from the Dropdown List. This is a required field.
- Enter the lecture number; be sure that the number must be numeric and integer data and not existing. This is a required field.
- Enter the lecture title in "Lecture Title" field. This field may be left null.
- Enter the lecture date in the "Date" field. There is a default date of the day date which you can change it into other date. Note that the date format here is "Days/Month/Year". This field may be left null.
- Enter a note on the lecture including its type to inform the user of the file type to take decision of downloading that file. This is a required field.
- Click on the "Browse" button to select a file for the lecture, this button will open a browser on your computer contents. This is a required field.
- Click on the "Add" button to insert and save the lecture's data and file material on the web server in DB.
- Click on the Reset button to clear the fields' data.

- **How to Delete Lectures?**

Use the Delete Lectures form

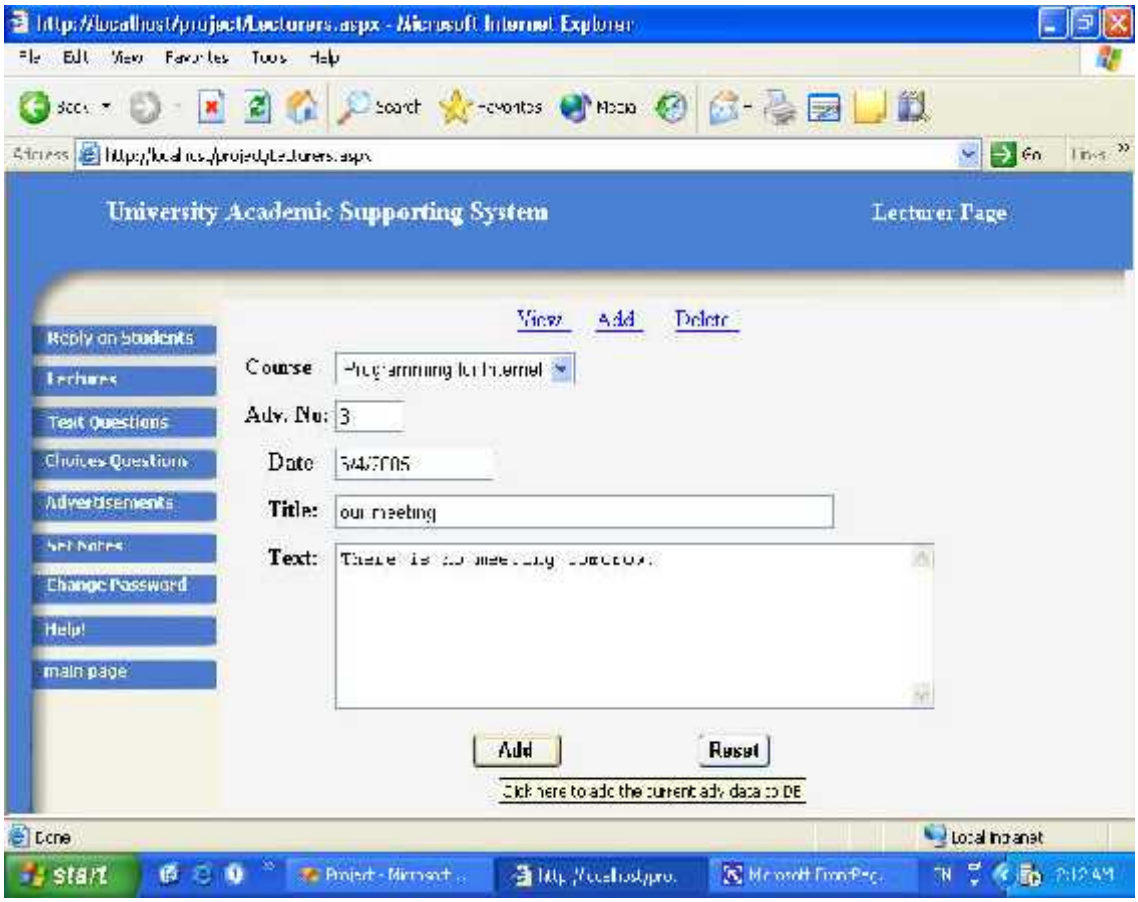


- Select a course from the Dropdown List. This is a required field.
- All available lectures data on the selected course will be displayed on the top part of this form.
- Checked the "Delete lecturer No" radio button if you want to delete a specific lecturer and then enter its number in the near text box.
- Checked the "Delete All Lectures" radio button if you want to delete all lecturers at the selected course.
- Click on "Delete" button to delete the lecturer(s) that you selected.
- Click on the "Reset" button to clear the fields' data and unchecked all selections.

Note: All other delete controls are the same way, such delete questions, advertisements…

- **How to Add Advertisements?**

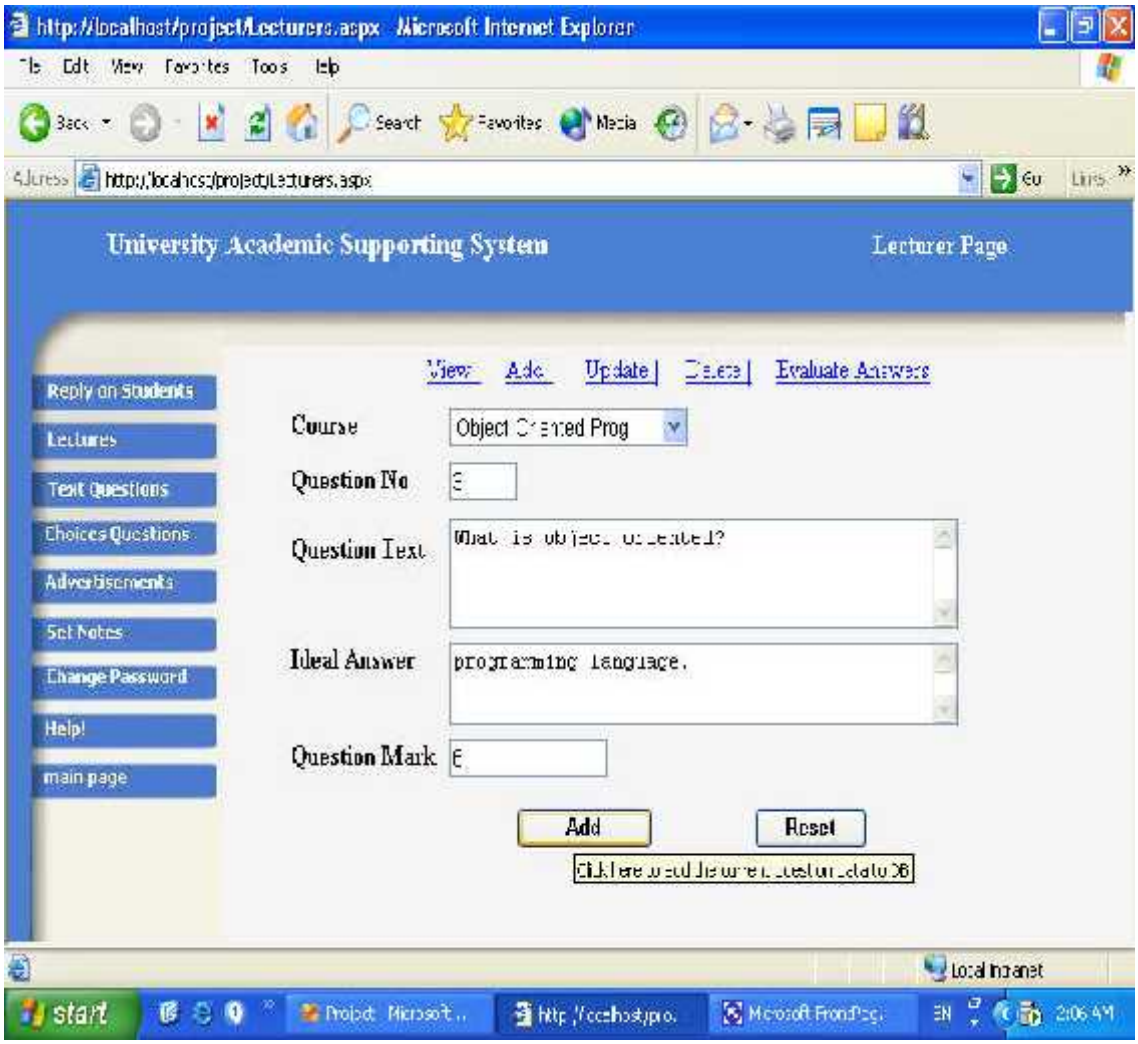
Use the Add Advertisements form



- Select a course from the Dropdown List. This is a required field.
- Enter the advertisement number; be sure that the number must be numeric and integer data and not existing. This is a required field.
- Enter the advertisement date in the "Date" field. There is a default date of the day date which you can change it into other date. Note that the date format here is "Days/Month/Year". This field may be left null.
- Enter the advertisement title in the "Adv. Title" field. This field may be left null.
- Enter the advertisement text in the "Adv. Text" field. This is a required field.
- Click on the "Add" button to insert and save the advertisement data on DB and then be available to the students.
- Click on the Reset button to clear all fields' data.

- **How to Add Text Questions?**

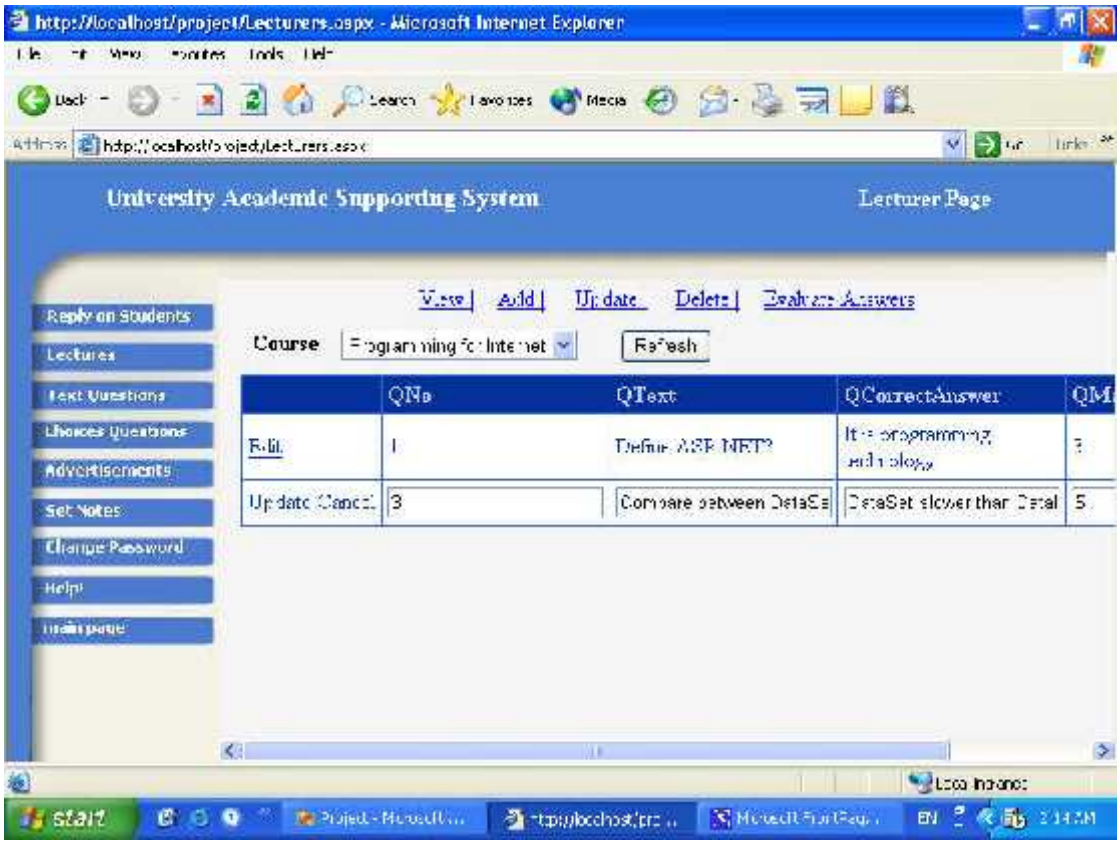
Use the Add Text Questions form



- Select a course from the Dropdown List. This is a required field.
- Enter the question number in QNo field; be sure that the number must be numeric and integer data and not existing. This is a required field.
- Enter the question text. This is a required field.
- Enter the question ideal answer in the "Ideal Answer" field. This field may be left null.
- Enter the question mark in the "Question Mark" field. . This field may be left null.
- Click on the "Add" button to insert the question data into DB.
- Click on the Reset button to clear the fields' data.

- **How to Update Text Questions?**

Use the Update Text Questions form

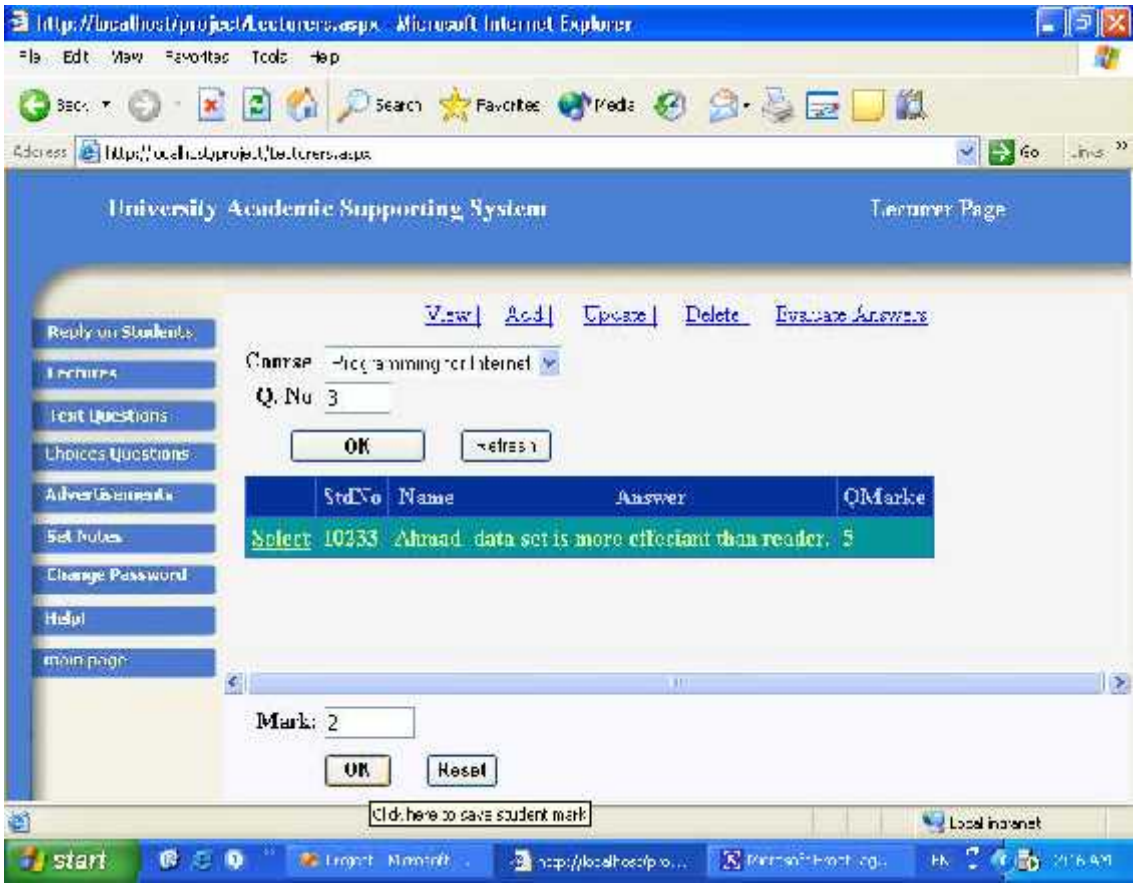


- Select a course from the Dropdown List. This is a required field.
- The available questions on this course will be displayed in the top part of form.
- If you want to update a specific question select it by clicking on the Edit link button. This is a required field.
- All field will be opened to update, so you can make any changes to any field excepted question number field.
- To save the updates click on the Update link button.
- To cancel the updates click on the Cancel link button.

Note: the same way is to update choice questions.

- **How to Evaluate Students Answers?**

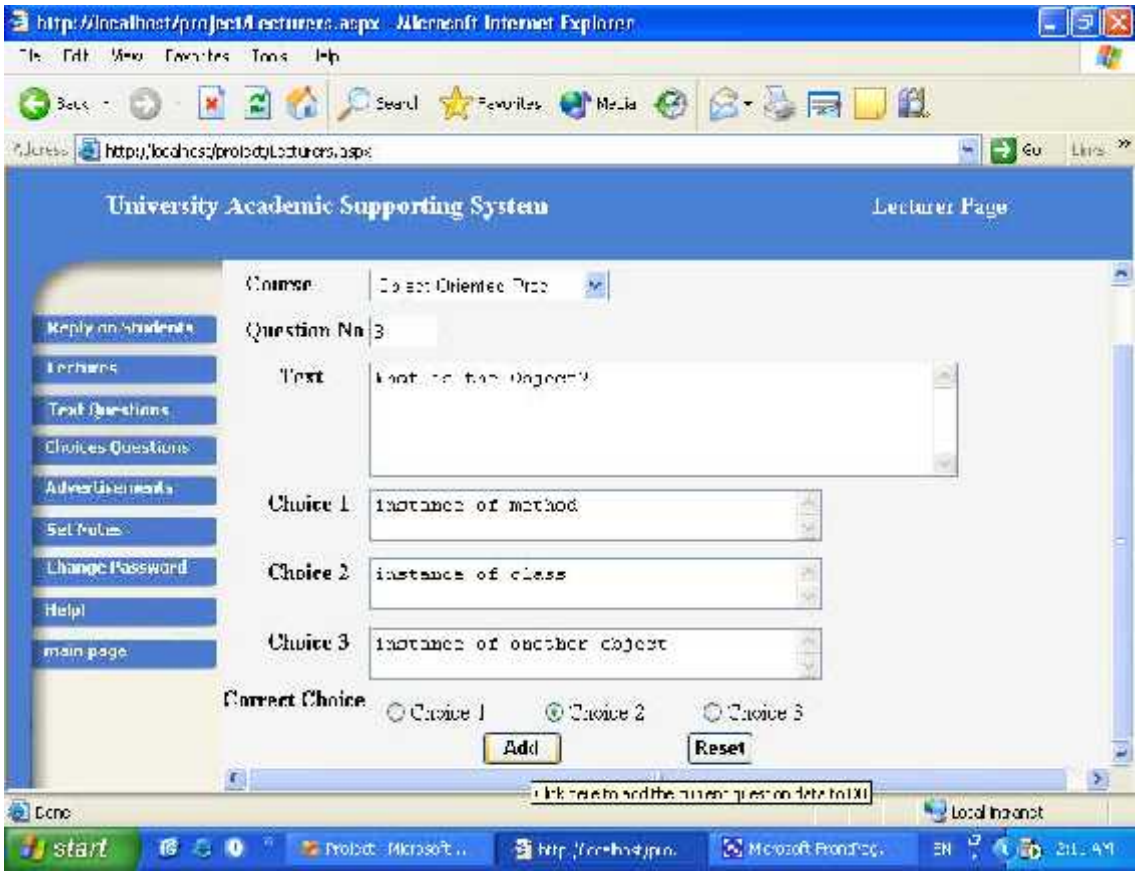
Use the Evaluate Answers form



- Select a course from the Dropdown List. This is a required field.
- Enter the question number that you want to evaluate students answers on it.
- Click on Ok button to display all students answers data on the selected course and question on the top part of this form.
- If you want to evaluate a specific students answer, select it by clicking on the Select link button. This is a required field.
- Enter the student mark in the Mark field. This is a required field.
- Click on "OK" button to save the mark and make it available to the student.
- Click on the "Reset" button to clear the mark field data.

- **How to Add Choice Questions?**

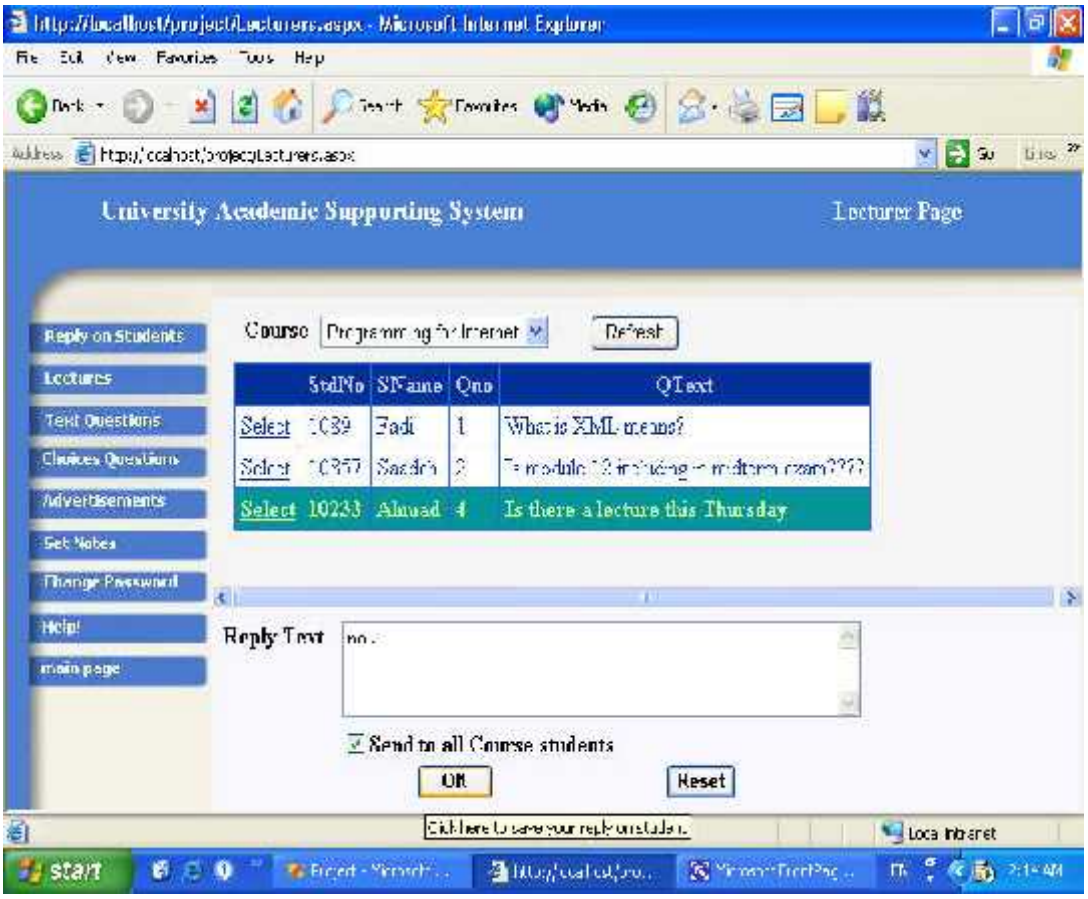
Use the Add Choice Questions form



- Select a course from the Dropdown List. This is a required field.
- Enter the question number; be sure that the number must be numeric and integer data and not existing. This is a required field.
- Enter the question text in the "Question Text" field. This is a required field.
- Enter the first choice text in the"Choice1" field. This is a required field.
- Enter the second choice text in the"Choice2" field. This is a required field.
- Enter the there'd choice text in the"Choice3" field. This is a required field.
- Checked one of the "Choice1", "Choice2", or "Choice3" radio buttons to be the correct choice of this question.
- Click on the "Add" button to insert and save the question's data on DB.
- Click on the Reset button to clear the fields' data and unchecked all selections.

- **How to Reply to Your Students?**

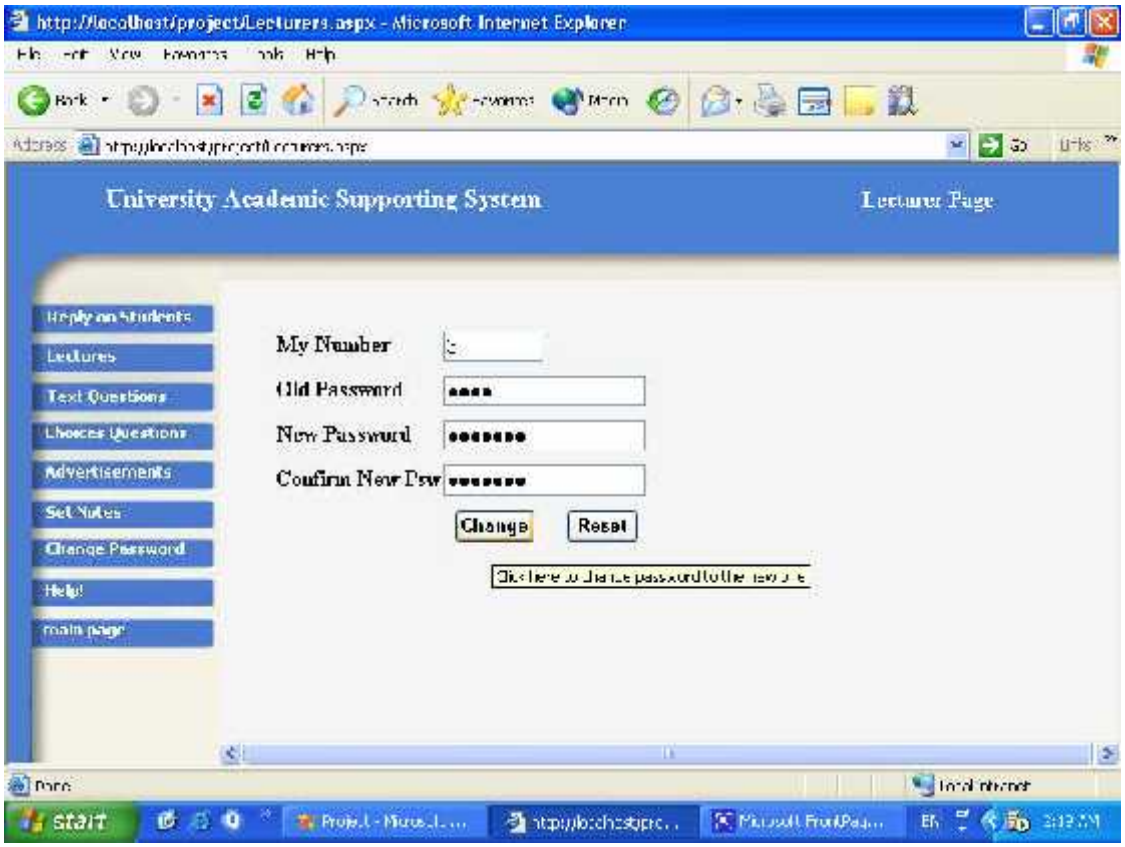
Use the Reply on Students form



- Select a course from the Dropdown List. This is a required field.
- The available un replied students questions on this course will be displayed in the top part of form.
- If you want to reply to a specific students select it by clicking on the Select link button. This is a required field.
- Enter your reply text in the Reply Text field, note that your reply length must be less than 1000 characters. This is a required field.
- If you want to generalize the question and its reply to all course students, checked the Send To all Course student check box.
- Click on the "OK" button to insert and save the reply data on DB and then be available to the students.
- Click on the Reset button to clear all fields' data and all selections.

- **How to Change Your Password?**

Use the Chang Password form



- Enter the your number in the Number field. This is a required field.
- Enter the old password in the Old Password field. This is a required field.
- Enter the new password in the New Password field. This is a required field.
- Reenter the new password in the Confirm New Paw field. This is a required field.
- Click on the "Change" button to change the old password into the new one.
- Click on the Reset button to clear all fields.

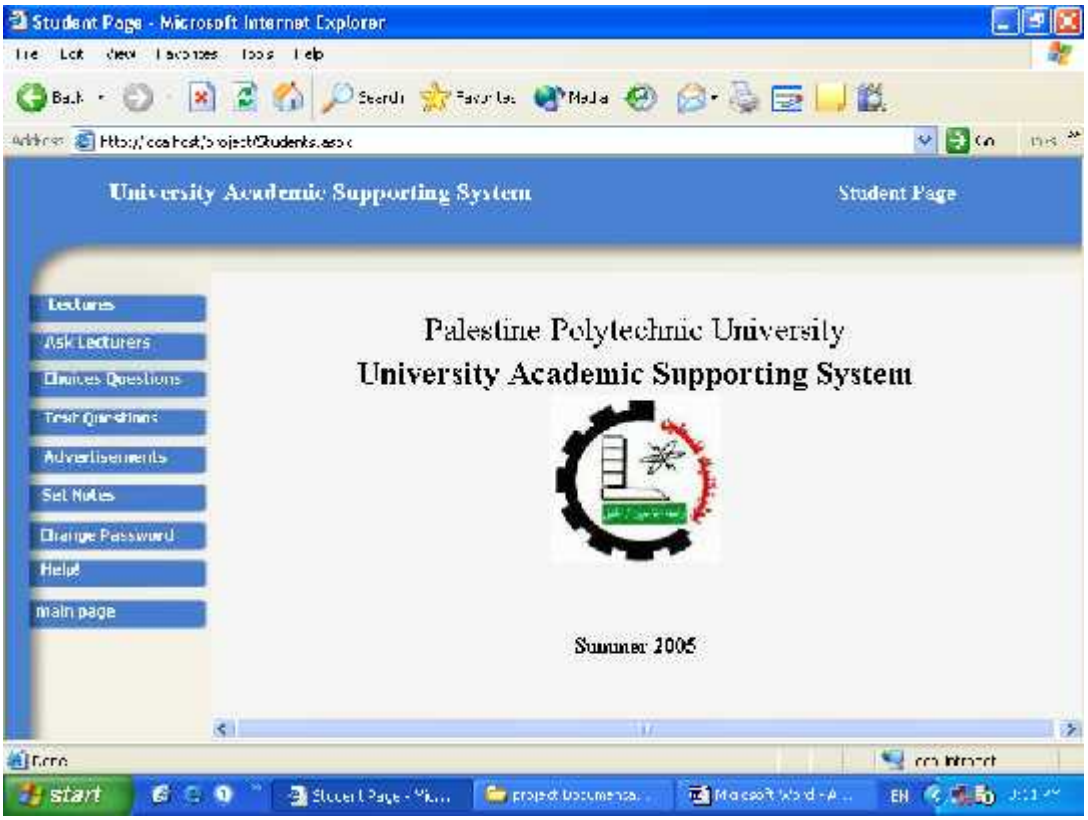
2.3 Student Manual

The student has many services on our system, here you can know:

- **How to Use this Page?**
- **How to Answer on Text Questions?**
- **How to Ask Your Lecturer?**
- **How to View Your Incoming Replies?**
- **How to View You Result?**
- **How to Change Your Password?**

- **How to Use this Page?**

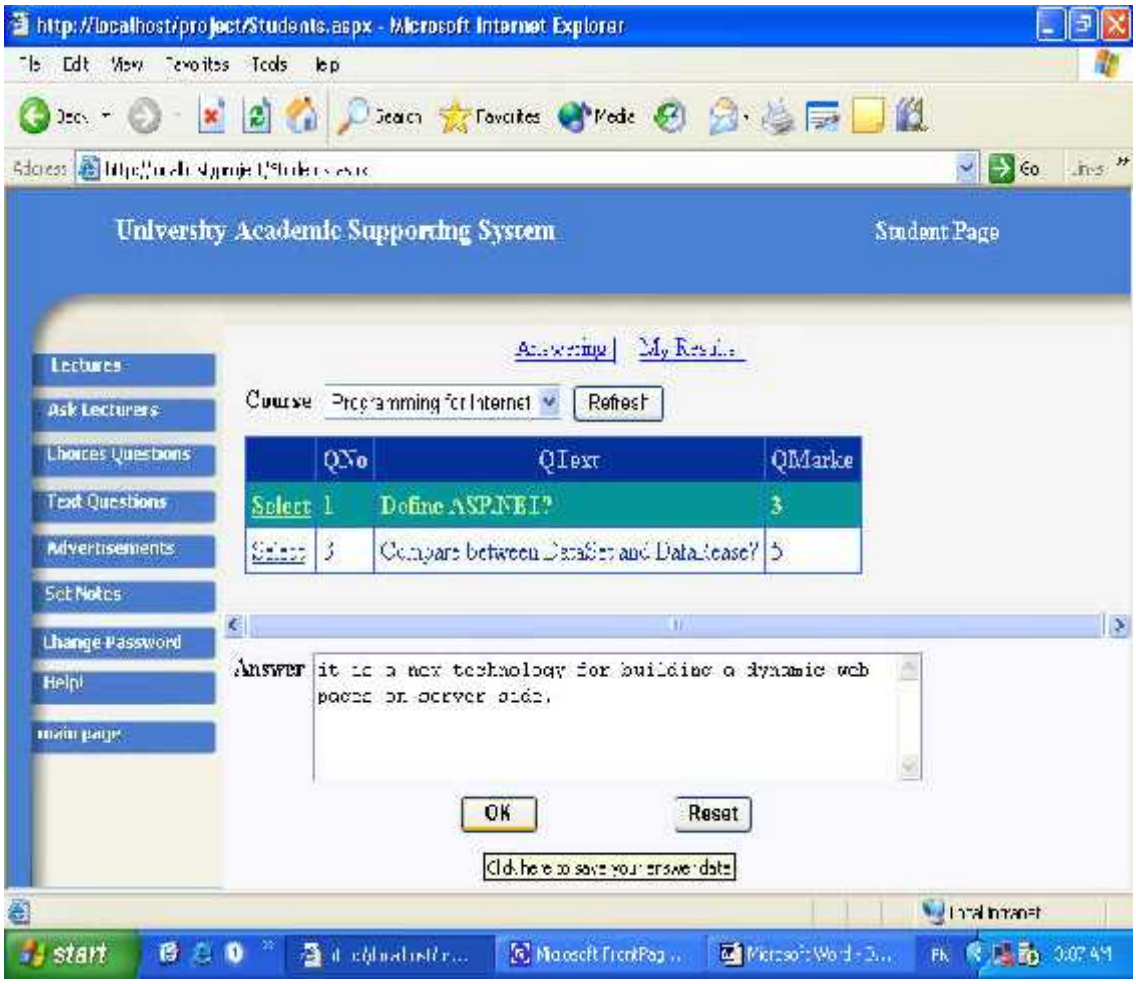
The student page has a menu with nine options links:



- Select the **"Lectures"** link to view the available lectures materials.
- Select the **"Ask Lecturers"** link to view the replying on students' questions page.
- Select the **"Choices Questions"** link to view choice questions page for answering on these questions.
- Select the **"Text Questions"** link to view the answering on text questions page.
- Select the **"Advertisements"** link to view the available advertisements.
- Select the **"Set Notes"** link to view the setting notes page in order to send notes on the site.
- Select the **"Change Password"** link to view the changing password page.
- Select the **"Help!"** link to view the available help materials on this page.
- Select the **"Main Page"** link to reset to the main page.

- **How to Answer on Text Questions?**

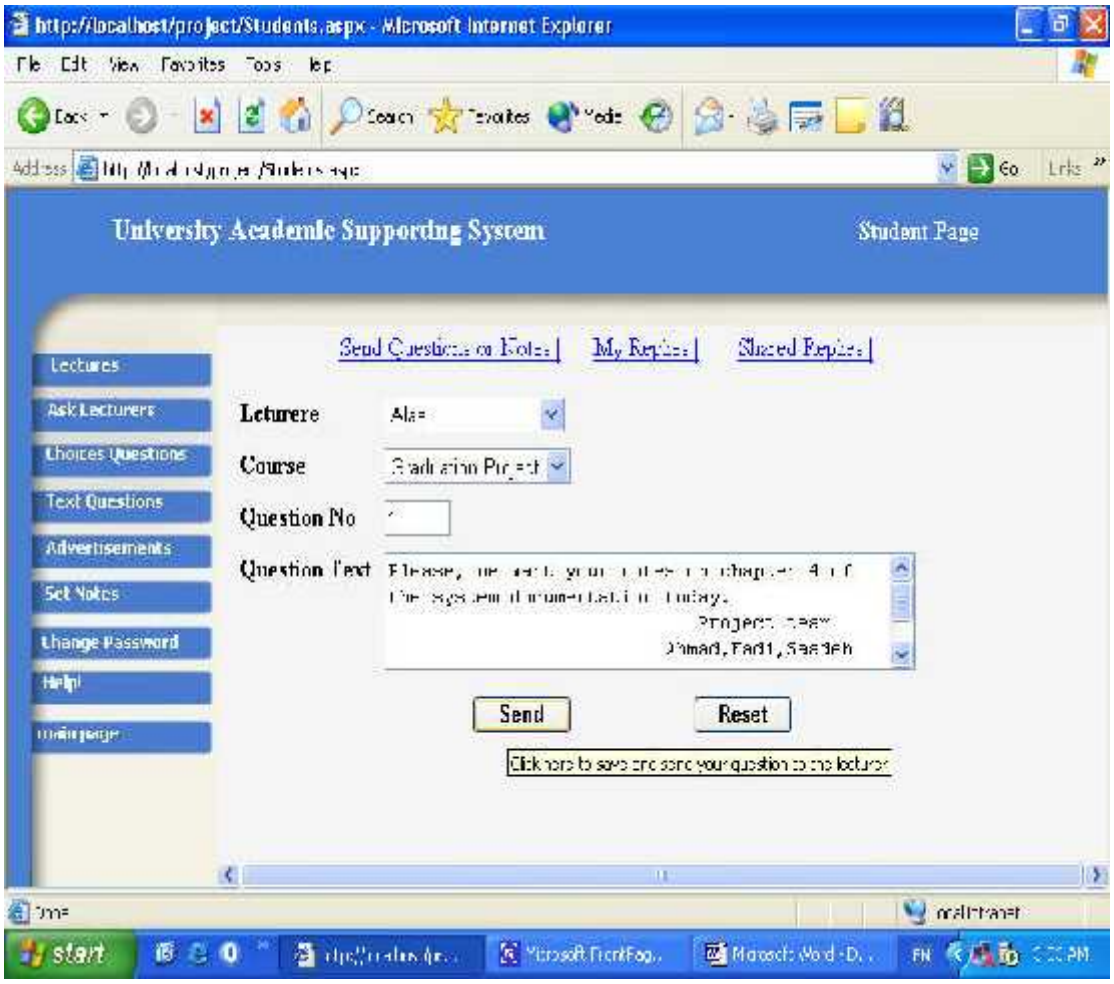
Use the Answering on Text Questions form



- Select a course from the Dropdown List. This is a required field.
- All available questions data on the selected course will be displayed on the top part of this form.
- Click on the Select button to specify which question you want to answer on it.
- enter you answer on the selected question, note that your answer text must be equal or less than 1000 characters.
- Click on OK button to save your answer data and make it available to lecturer to evaluate it.
- Click on Reset button to clear the answer text field.

- **How to Ask Your Lecturer?**

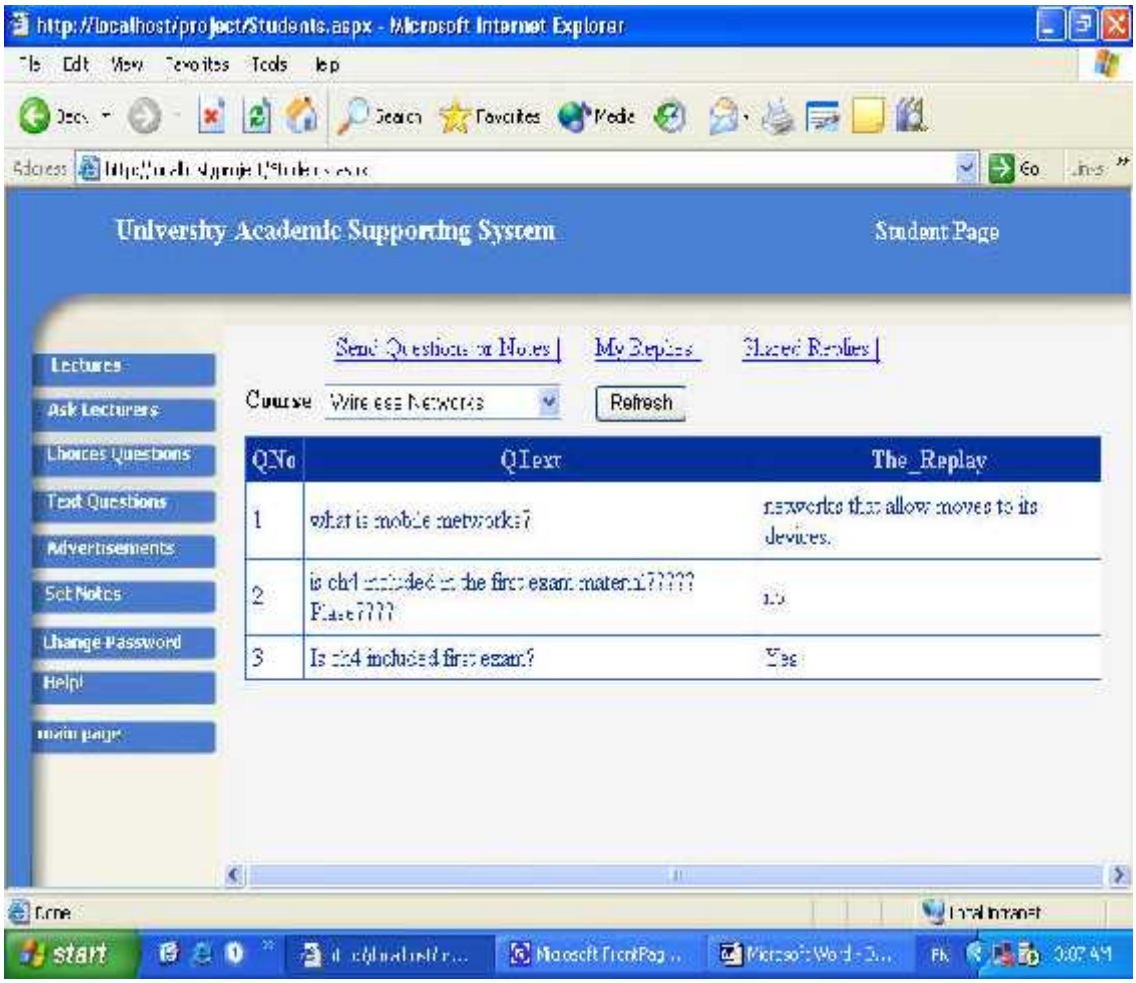
Use the Ask Lecturer form



- Select a Lecturer from your lecturers from the Lecturer Dropdown list. This is a required field.
- Select a course from your courses from the course Dropdown List to send question on it. This field may be lifted null (unselected).
- A question number will be displayed automatically to represent your question number on that course and to that lecturer.
- Enter your question text in the Question Text field, note that text must be less than or equal 1000 characters. This is a required field.
- Click on the Send button to save question data and make it available to the lecturer.
- Click on Reset to clear all fields and selections.

- **How to View Your Incoming Replies?**

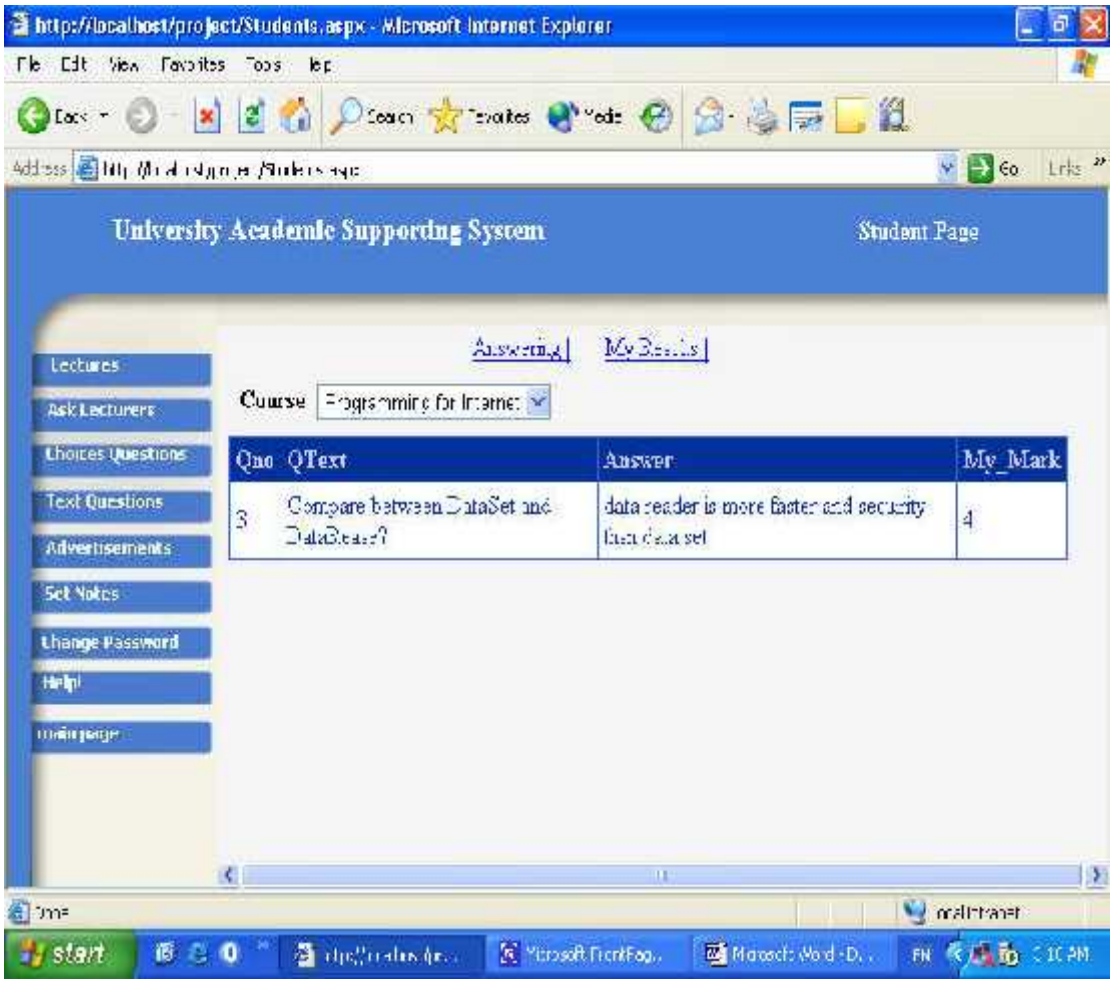
Use the My Replies form



- Select a course from the Dropdown List. This is a required field.
- All available incoming replies from your lecturers on the selected course will be displayed.

- **How to View You Result?**

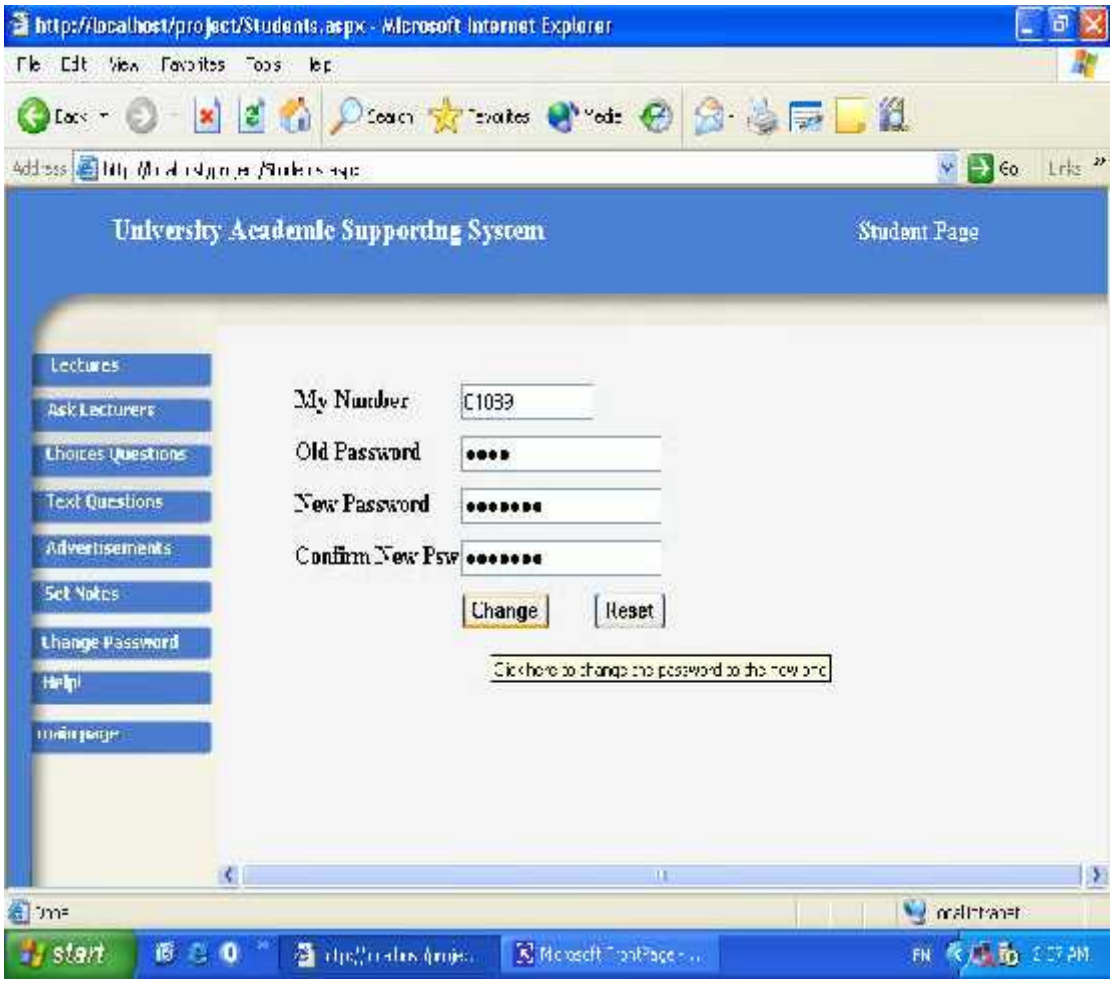
Use the My Results form



- Select a course from the Dropdown List. This is a required field.
- All your answers that have be evaluated from your lecturers will be will be displayed.

- **How to Change Your Password?**

Use the Chang Password form



- Enter the your number in the Number field. This is a required field.
- Enter the old password in the Old Password field. This is a required field.
- Enter the new password in the New Password field. This is a required field.
- Reenter the new password in the Confirm New Paw field. This is a required field.
- Click on the "Change" button to change the old password into the new one.
- Click on the Reset button to clear all fields.

2.4 Administrator Manual

2.4.1 How to install the System.

This process involves fixing and setting up all the hardware requirements and installing all software programs and facilities in the system environment in order to enabling the system behave and perform more effective.

- **Setting up the hardware requirements**

The hardware equipments that required in the system operation stage have been described and specified at the feasibility study in system specification chapter (Chapter 1 section 1.6.2.2.1). These requirements and equipments must be fixing and setting up by specialist team on the university that wants to apply this system.

- **Install a server operating system**

A Server Operating System such Windows server 2003 required to be installed on both web server and data base server if there was two separate devises.

- **Install Data Base Server**

The system required a Data Base server such SQL server 2000 to be installed in its working environment. The SQL Server will be responsible for managing data access and transactions during the operation stage of the system.

- **Hosting and Domain name registration.**

Hosting means that who is to be responsible for hosting and managing the system contents and design? It may be self responsibility by the university itself or external responsibility by an external Internet Service Provider.

We found that it is more effective and efficient to be self hosting responsibility rather than external one, since the use of the existing equipments and capabilities

and the more flexibility to controlling and monitoring the system contents and design.

Specialist's team in the university will take the responsibility for making all facilities and requirements required to hosting an domain name registration for the site on the university web server.

- **Publishing the System Database.**

The system without its database is not a completely system, it is just a browsing system without meaning or useful. So the system database must be installed or in other meaning, published, on the database server at its environment.

Since our system environment was a university environment, there are many tables data in our system database required to be retrieved from the university registration database, these tables are labeled in the System Requirements Specification chapter (Chapter 2 section 2.4.3). Other tables are to be created by the installation/operation team in the system environment. These tables are to be structured only created and then using the system forms to filling it with data.

- **Publishing the System (Site) Pages.**

In order to publish the site web pages, specialists' team required to take his responsibility of making all facilities and requirements that required improving the publishing operation including registration for a domain name and any other step during that operation.

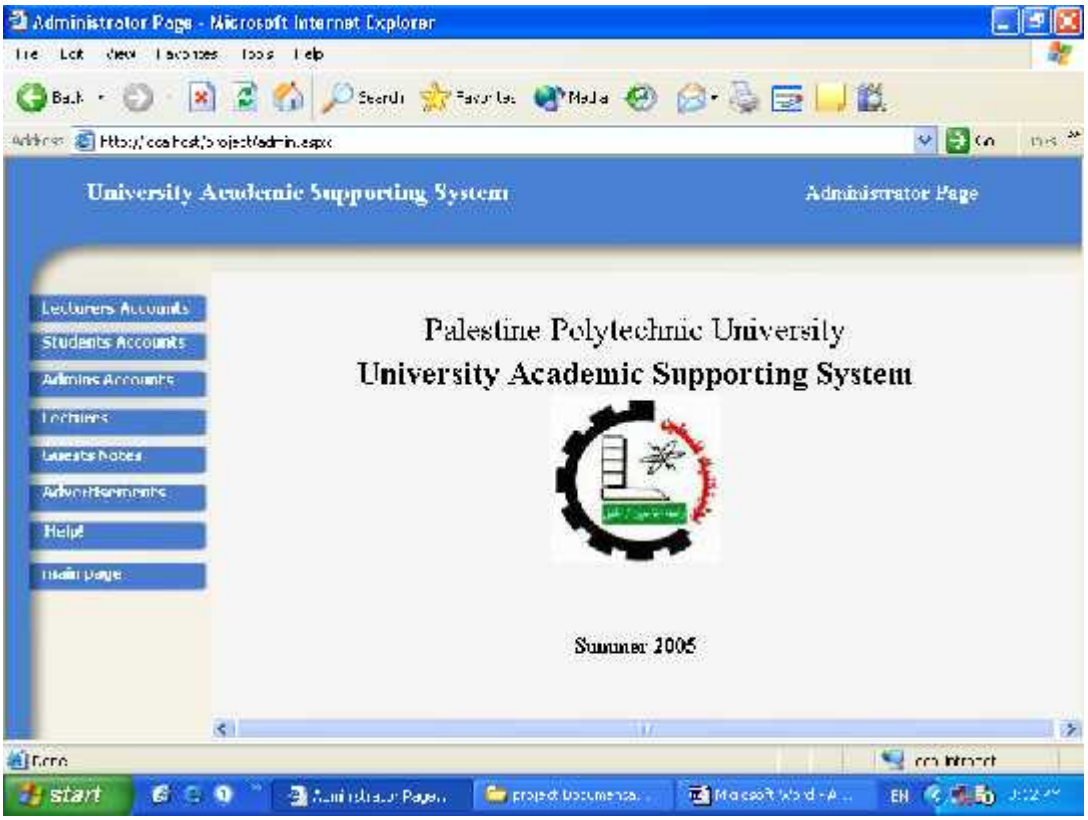
2.4.2 Administrator Services:

The administrator has many services on our system, here you will know:

- **How to Use this Page?**
- **How to View Administrators Accounts?**
- **How to Add Administrators Accounts?**
- **How to Delete Administrators Accounts?**
- **How to Deny Administrators Accounts?**
- **How to Activate Administrators Accounts?**
- **How to Chang Administrators Accounts Password?**
- **How to View Guest Notes?**
- **How to Delete Guest Notes?**

- **How to Use this Page?**

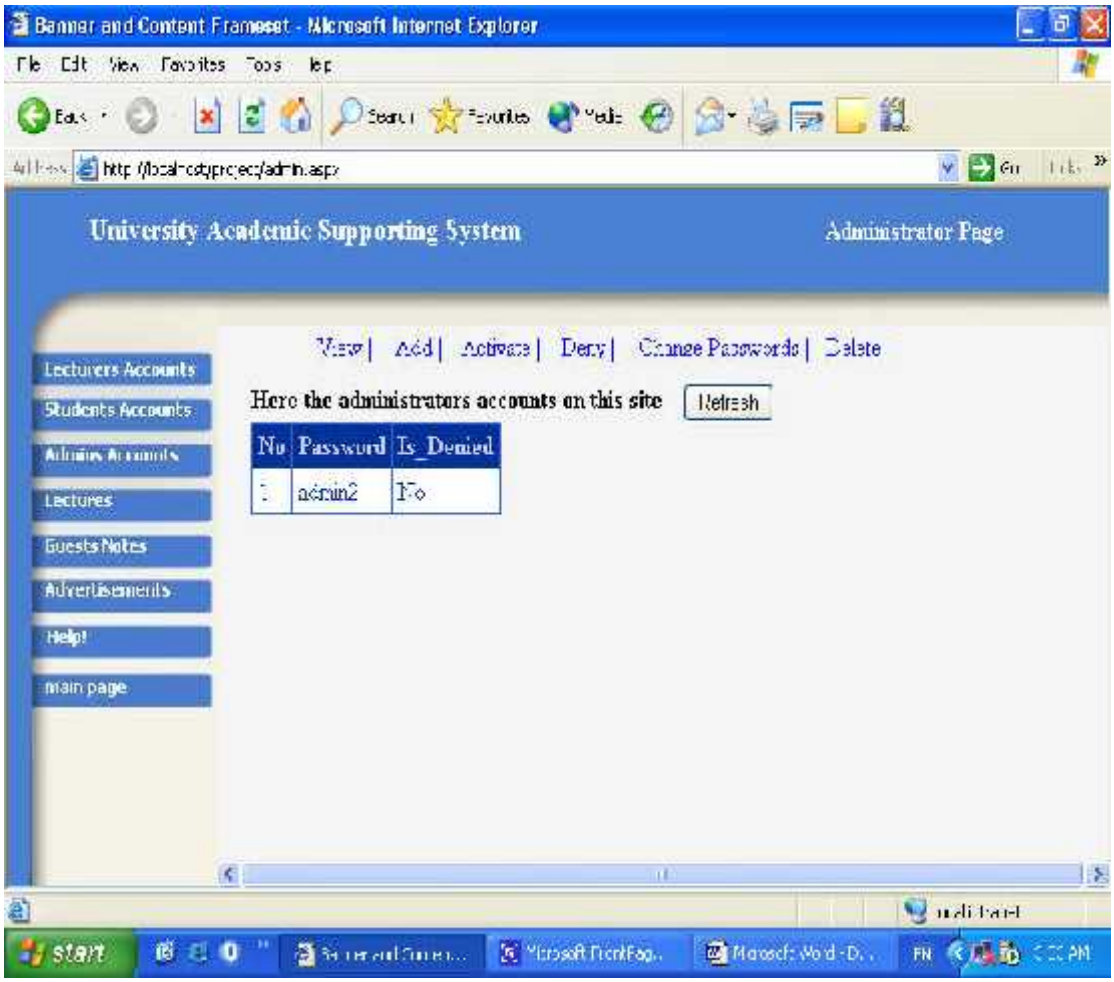
The administrator page has a menu with nine options links:



- Select the **" Lecturers Accounts"** link view the lecturers accounts control page.
- Select the **" Students Accounts"** link view the students accounts control page.
- Select the **" Admins Accounts"** link view the administrators accounts control page.
- Select the **"Lectures"** link to view the lectures control page.
- Select the **" Guests Notes"** link to view guests notes control page.
- Select the **"Advertisements"** link to view the advertisements control page.
- Select the **"Help!"** link to view the available help materials on this page.
- Select the **"Main Page"** link to view the home (main) page.

- **How to View Administrators Accounts?**

Use the View Administrators Accounts form

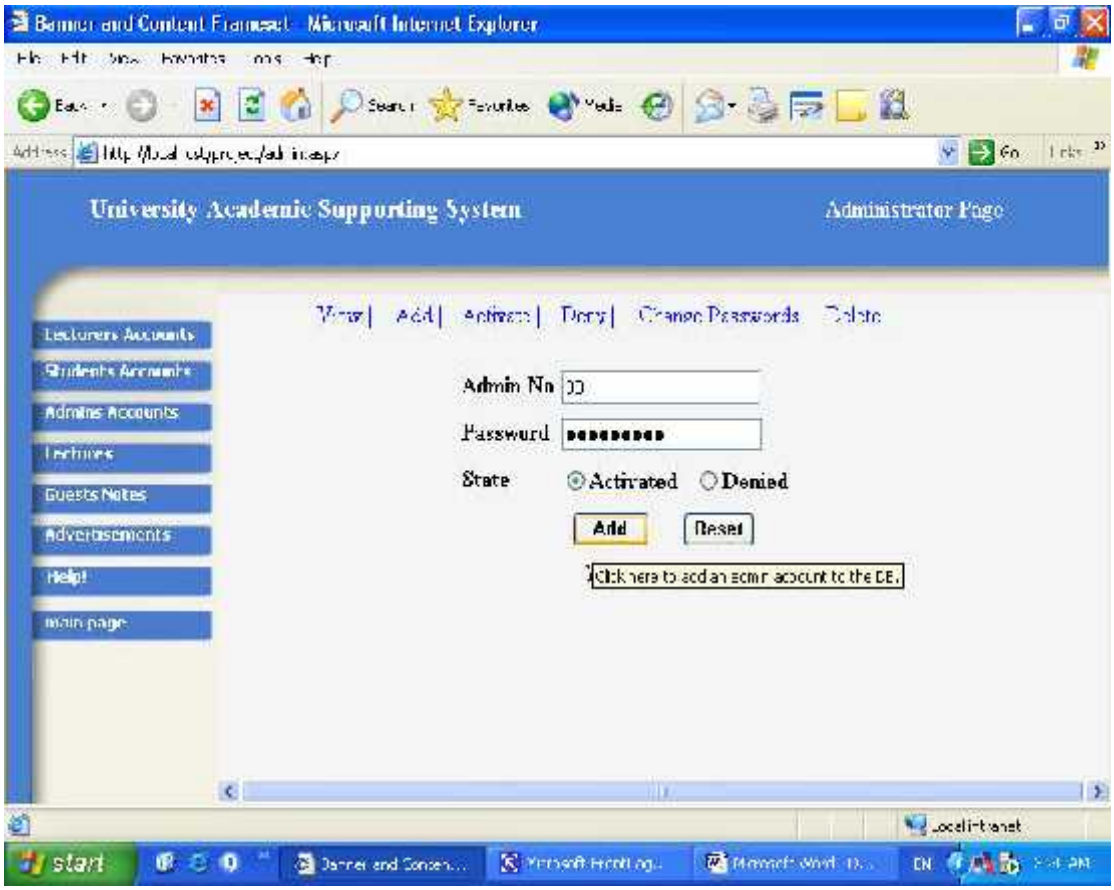


- Select the Admins Accounts link from the main menu.
- Select View link from the top menu, then the administrators accounts displayed.

Note: the same way is to view other accounts, such students and lecturers accounts.

- **How to Add Administrators Accounts?**

Use the Add Administrator Account form

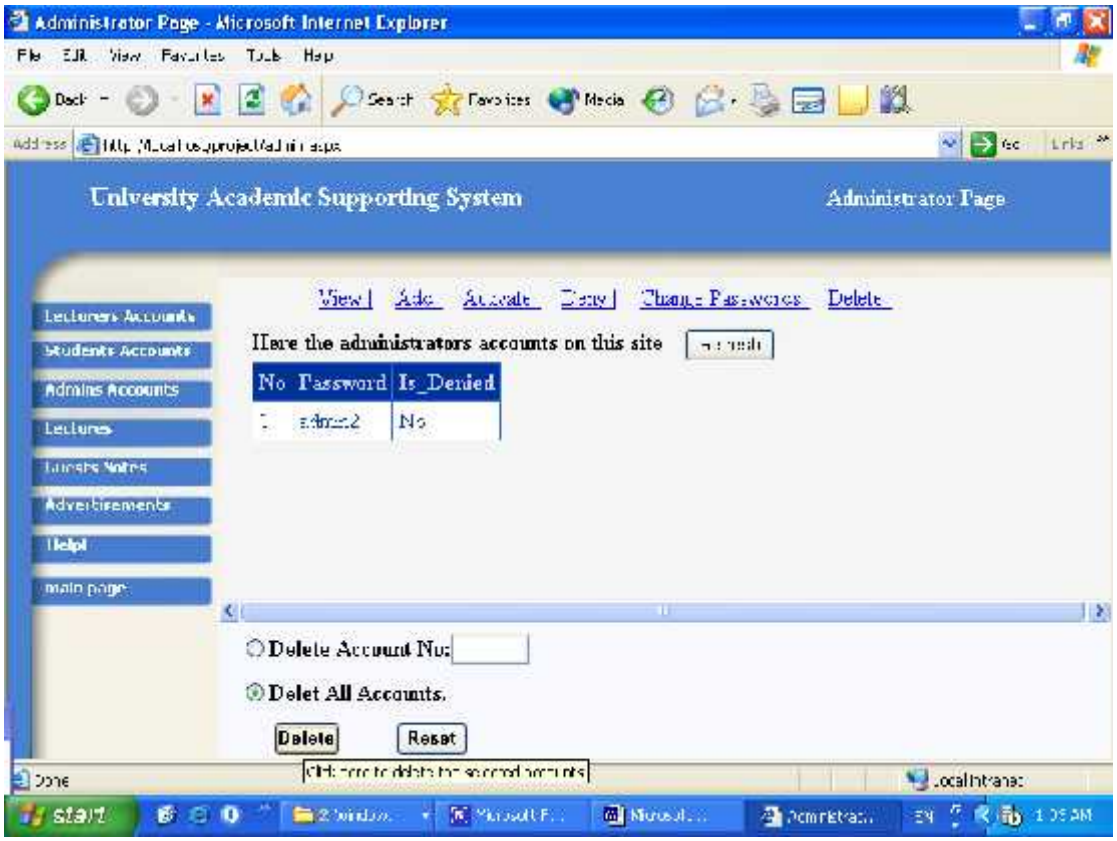


- Enter the administrator number as supplied from the university in the Admin No field, note that the number must be numeric and integer data. This is a required field.
- Enter his/her password (there is no restrictions) in the Password field. This is a required field.
- Determine the account state to be activated or denied by checked one of the tow radio button.
- Click on the Add button to save the account data in DB.
- Click on the Reset button to clear the fields' data.
- Any message to be viewed will appears on the "Your Messages here" label, such that there is an existing account with the same number.

Note: the same way is to add other accounts, such students and lecturers accounts.

- **How to Delete Administrators Accounts?**

Use the Delete Administrators Accounts form

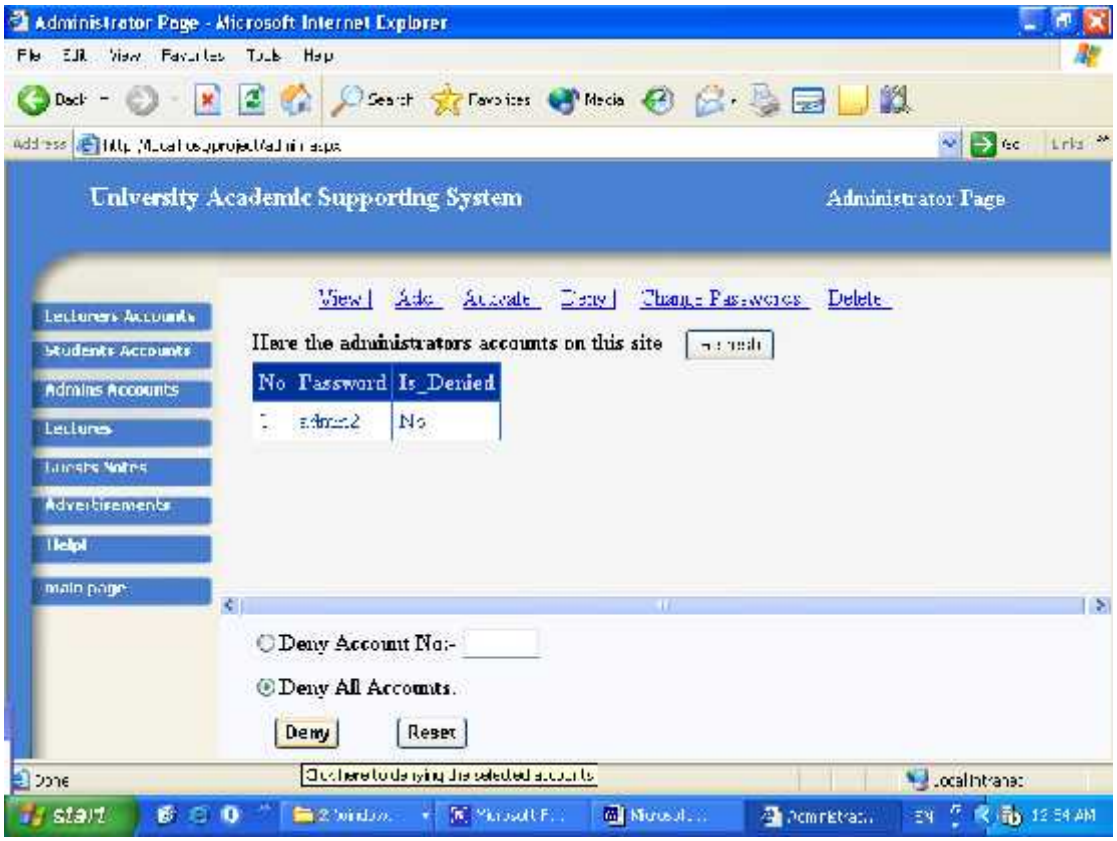


- All accounts on this system and their information will be displayed on the top part of this form.
- Checked the "Delete Account No" radio button if you want to delete a specific account and then enter its number in the near text box.
- Checked the "Delete All Accounts" radio button if you want to delete all accounts as a hole.
- Click on "Delete" button to delete account(s) that you selected.
- Click on the "Reset" button to clear the fields' data and unchecked all selections.

Note: the same way is to delete other accounts, such students and lecturers accounts.

- **How to Deny Administrators Accounts?**

Use the Deny Administrators Accounts form

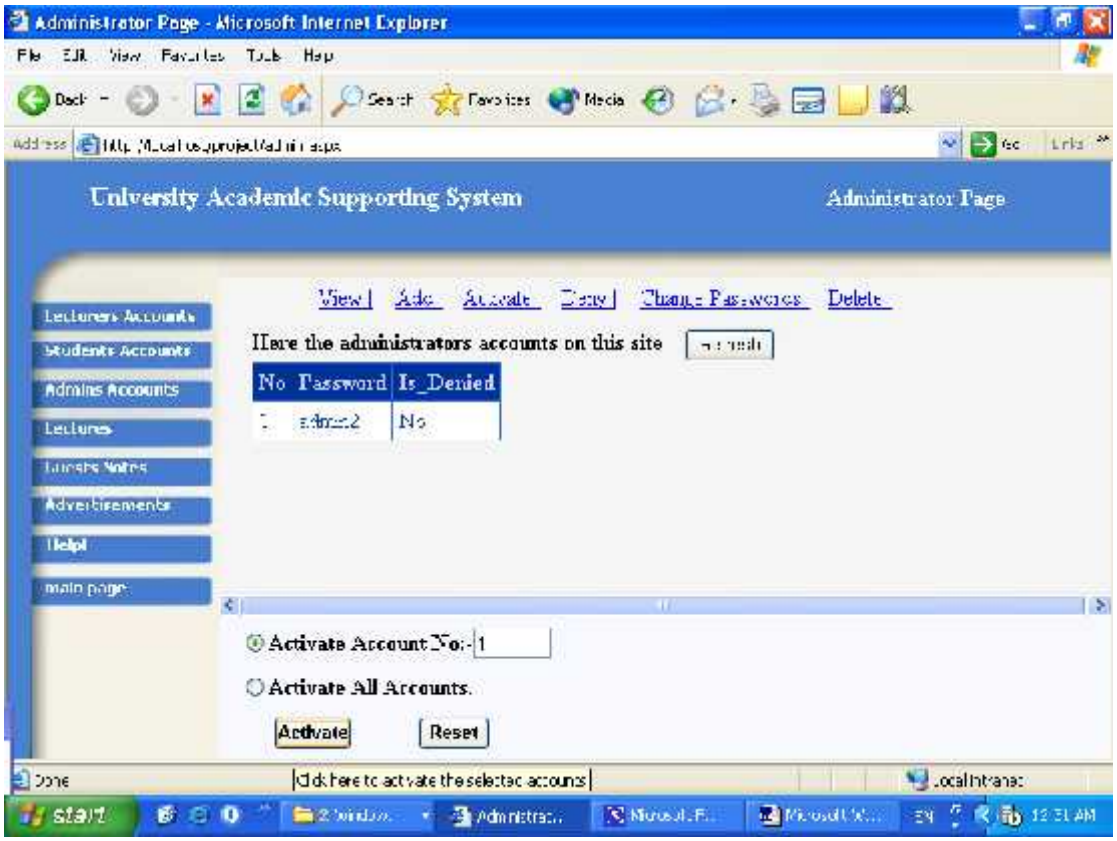


- All accounts on this system and their information will be displayed on the top part of this form.
- Checked the "Deny Account No" radio button if you want to deny a specific account and then enter its number in the near text box.
- Checked the "Deny All Accounts" radio button if you want to deny all accounts as a hole.
- Click on "Deny" button to deny account(s) that you selected.
- Click on the "Reset" button to clear the fields' data and unchecked all selections.

Note: the same way is to deny other accounts, such students and lecturers accounts.

- **How to Activate Administrators Accounts?**

Use the Activate Administrators Accounts form

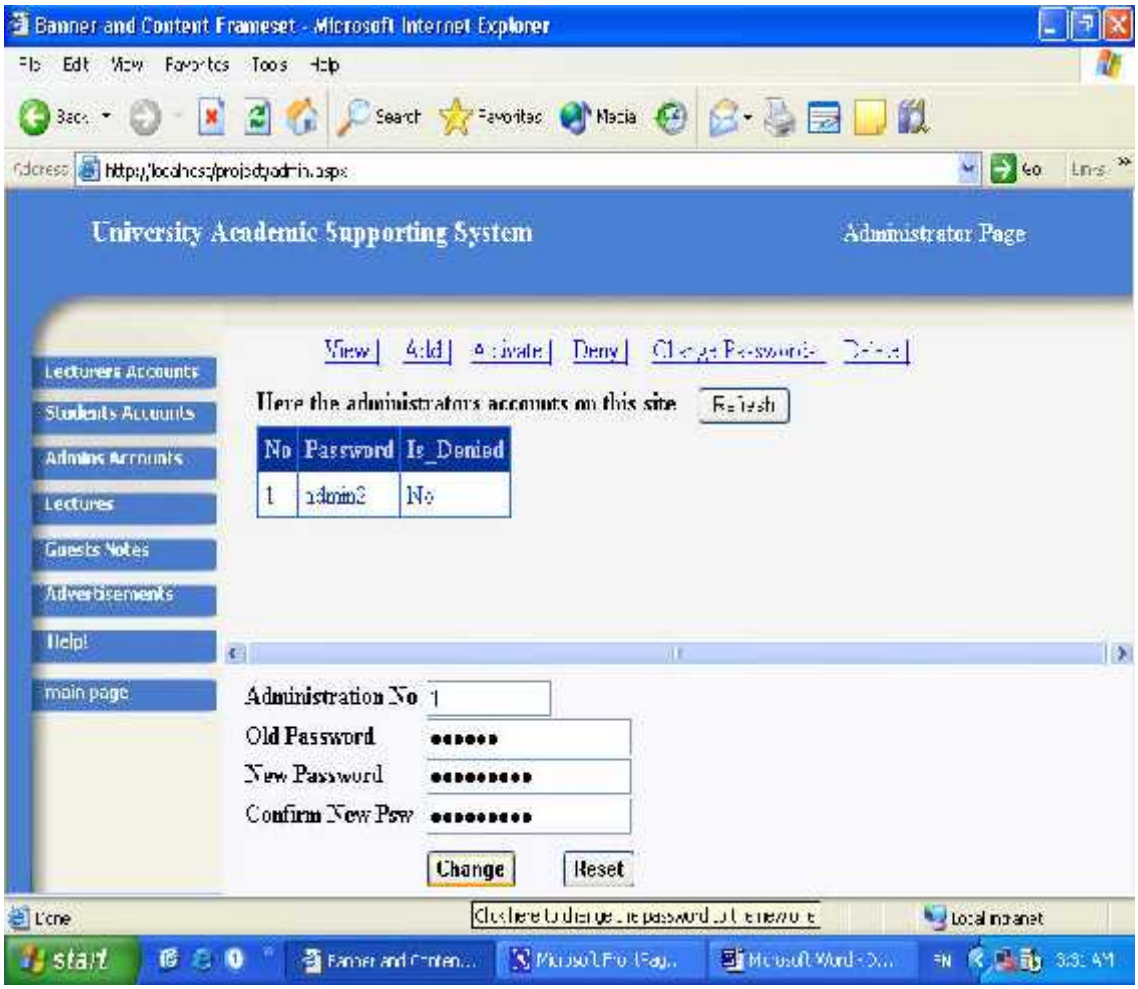


- All accounts on this system and their information will be displayed on the top part of this form.
- Checked the "Activate Account No" radio button if you want to activate a specific account and then enter its number in the near text box.
- Checked the "Activate All Accounts" radio button if all accounts are denied and you want to activate them as a hole.
- Click on "Activate" button to activate account(s) that you selected.
- Click on the "Reset" button to clear the fields' data and unchecked all selections.

Note: the same way is to activate other accounts, such students and lecturers accounts.

- **How to Chang Administrators Accounts Password?**

Use the Chang Password form



- All accounts on this system and their information will be displayed on the top part of this form.
- Enter the account number in the Number field. This is a required field.
- Enter the old password in the Old Password field. This is a required field.
- Enter the new password in the New Password field. This is a required field.
- Reenter the new password in the Confirm New Paw field. This is a required field.
- Click on the "Change" button to change the old password into the new one.
- Click on the Reset button to clear all fields.

Note: the same way is to change password for other accounts, such students and lecturers accounts.

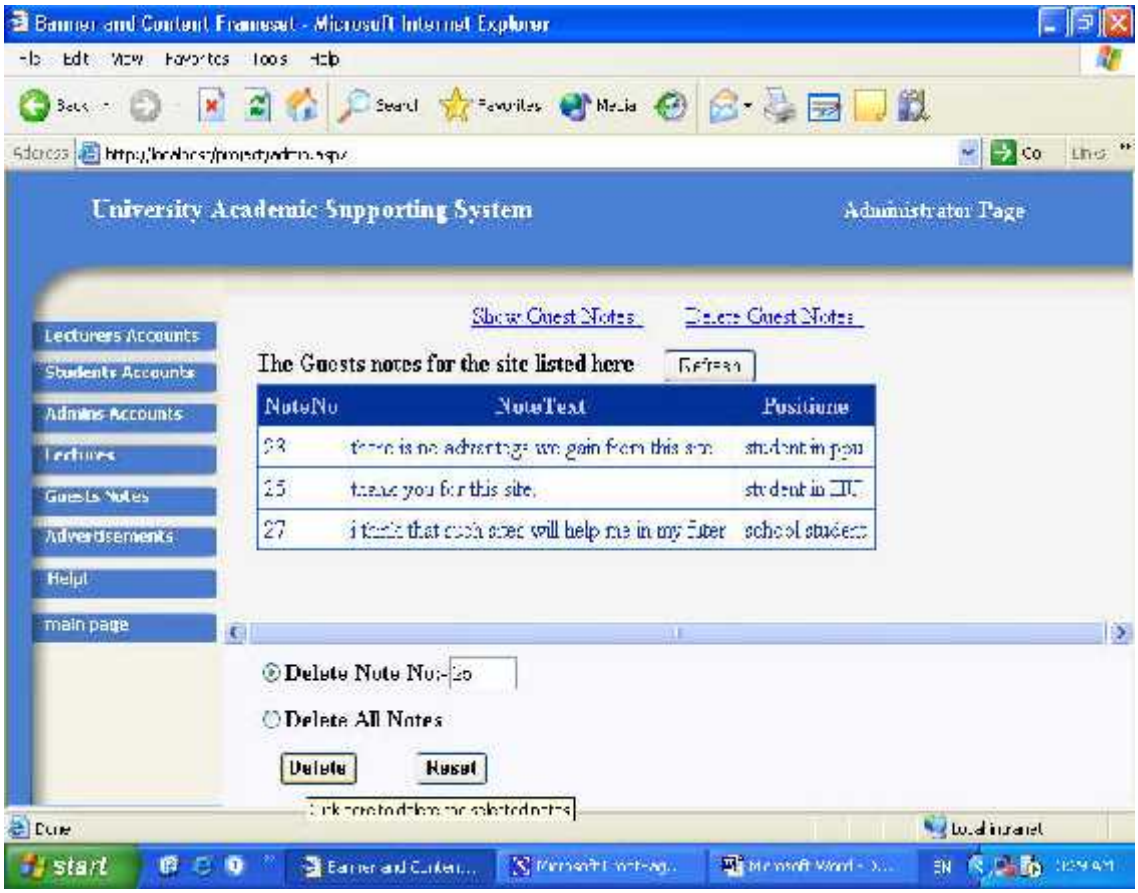
- **How to View Guest Notes?**

Use the Show Guest Notes form

- Select the Guest Notes link from the main menu.
- Then, the viewing notes form will be displayed automatically.

- **How to Delete Guest Notes?**

Use the Delete Guest Notes form



- All notes data on the site will be displayed on the top part of this form.
- Checked the "Delete Note No" radio button if you want to delete a specific note and then enter its number in the near text box.
- Checked the "Delete All Notes" radio button if you want to delete all notes at the site.
- Click on "Delete" button to delete the note(s) that you selected.
- Click on the "Reset" button to clear the fields' data and unchecked all selections.

Appendix B

CD (Compact Disk)

CD contents:

- Program source code.
- User Manual.
- Documentation.
- Installation Guide.
- PowerPoint Slides.
- System Database File.

Note: The CD comes within the delivered package.

Dedication

To our fathers and mothers.

To our brothers and sisters.

To our friends and all people we love.

To our University, our instructors and teachers.

To all who gave themselves and lives so others live.

To all of them we present this honest work.

We dedicate this Project

PROJECT TEAM

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Chapter Five

The University Academic Supporting System is a web based application, so it can be run over the internet in a parallel and complementary manner within the studying operation in a university to serve and improve that operation and provide an another new way of communication and interaction between the most important parts of the studying operation whom are students, lecturers, and courses.

Problem Definition

According to the current evolution in the internet technology, according to our knowledge as university students of what is the most important academic issues that the students wants, and according to our knowledge as an information technology major's students of how to achieve these wants and requirements using the technology capabilities, we found that it is a good idea to develop a university academic supporting system.

System Objectives and Importance

The importance of the system comes from its main objective which is to serve and improve the academic operation at the university that consists of students, lecturers, and courses through the following:

- Taking the main advantages of the E-Learning concept since we can get the information without need to physical connection with its source.
- Providing the students with a diverse collection of learning styles and methods that satisfy their own learning preference through
    - providing different types of lectures materials (text, audio, or video),
    - two types of questions (multiple choice questions and text questions),
    - a mechanism of contact with their lectures through sending questions or notes to their lecturers.
- Enabling lecturers to
    - contact with their students through sending replies on their questions or setting advertisements to keep students awareness of their courses news.
    - evaluate their students' interaction and understanding with their courses through the ability of evaluating the students' answers on the text questions.

- Providing any guest with
    - available online learning materials(Lectures),
    - evaluating his/her usefulness through answering on a collection of multiple choices questions on that materials and getting his/her result directly.

System Functional Requirements

- **Online course lectures.**

  The system will provide many services on the courses lectures to its users according to theirs privileges. Both of lecturer and administrator users have the ability to viewing, adding, and deleting lectures material on course but the student and guest users have the ability of just viewing the available lectures material.

- **Course questions.**

  The system will provide two kinds of questions which are questions that required a text answers and questions that required choosing the answer from multiple choices provided. Only the lecturer user has the ability of viewing, adding, updating, and deleting these questions on his/her courses. The student can view and answer on the two questions kinds, but the guest user can view and answer on the multiple choice questions only.

- **Lecturers and students communication.**

  Through this service, both of students and lecturers can contact with each other through the mean of sending questions or notes from students to their lecturers and sending replies from lecturers to their students' questions.

- **Online advertisements.**

  The online advertisements will provide a mechanism of keeping students awareness with their courses news through sending advertisements by lecturers to their courses students. The lecturer user has the ability of viewing, adding, and deleting advertisements. The student user can only view the advertisements on his/her courses.

- **Administrator management controls**

  Administrator management controls on the system and users accounts such as:

  - Updating the system contents and design.
  - Add, Delete, Deny, Activate, and Change Password of the users' accounts.

System Non-Functional Requirements

- **User friendly interface and ease of use**

  Our system is a user friendly interface system since the use of menus with a full meaning and familiarity text items to navigate between web forms, dropdown lists to view and select data from, buttons, hyperlinks, and other graphical components that make the interface between the system and the user more friendly.

- **Flexibility**

  Students, lecturers, administrators, and any guest can access the site system from any where using any connected to the internet computer's browser since the using of ASP.NET technology with the .NET Framework which is a platform independent.

- **Availability**

  The site system services are available at any time and any where for any one, so students, lecturers, administrators, and any guest can visit it and take its services each with it's privileges.

- **Security**

  Our site system is a secure system since there are three pre made accounts students, lecturers, and administrators. So never some one to be authorized to access any accounts except its owner. Also there is another who can visit the site without a pre made account but as a guest with specific privileges.

- **Robustness**

  The system must provide a high level of robustness, such to be working the longest time before coming down, with a low percentage of events causing failure, and with a low probability of data corruption on failure.

- **Cultural and political**

  The system is to be performed and behave in a related environment and with specific users whom are university students, so it must be consider the cultural and political rules or guidelines that acts in its user's environment.

- **Consistency**

  Our system is a consistence system since all the comparable operations are to be activated or done in the same way at any time, so the system users never to be surprised by its behavior.

- **User guidance**

  Our system provides a meaningful feedback when errors occur and provide a context-sensitive user help facilities.

- **User diversity**

  Our system provides appropriate interaction facilities for different types of users, such lecturers, students, guests, and system administrators.

- **Learnability**

  On our system it doesn't take any new user long to become productive and effective with it.

Specific system constrains

- To the required login users; user name must be unique and identical in order to gain higher levels of system accessing security, also the user name represented by the user university number such as student number.

- Each user who wants to access the site system as a student, a lecturer, or an administrator must be registered in the university for the current semester.
- The advertisements materials, lectures materials, replies on students, answers results, etc is to be available on line for a specific period of time a according to the university academic rules.
- The date format here is Month/Days/Year.

Cost Sums

- **Development stage costs:**

Requirements/Items	Total costs
Hardware Requirements	$860
Software Requirements	$810
Human Requirements	$550
Total	**$2220**

- **Operational stage costs:**

Requirements/Items	Total cost
Hardware Requirements	$5000
Software Requirements	$2000
Human Requirements	$800
Total	**$7800**

Time Schedule

The system implementation time is about 15 weeks. These weeks are organized and arranged in a manner to not exceed the dead line of each task. Our work is shown in the following time schedule:

Tasks	Process	Days(weeks)
T1	System planning and feasibility study	**2**
T2	Requirement collection and analysis	**2**
T3	System design	**3**
T4	Coding	**4**
T5	Implementation	**2**
T6	Testing	**2**
T7	Documentation	At each week
Total		**15 weeks**

System Implementation

Coding the system functions and requirements using:

- Visual Basic.Net programming language within the Visual Studio.Net environment that applying the ASP.NET technology.

Creating the system database using:

- SQL server 2000 enterprise edition.

System Testing

Used testing processes or types:

- **Requirements-based testing**: consider each requirement and derive a set of tests for it. This type of testing aimed to insure that the requirements have been satisfied and achieved. Here, the Requirements-based testing included with some of validation criteria testing
- **Integration testing:** System integration means that the system is to be built through integrate its subsystems and parts into one system. So System integration testing aims to find out and recover all problems or defects that may be arise during the system components interactions.
- **System testing:** Here, are some snapshots of the most important requirements and functions in the system. These snapshots illustrate how the user can input the data then how that data will be stored in the system database.
- **Acceptance testing:** Here, the system is to be tested against its requirements design and implementation to see where it performs as the users expected and satisfying their requirements or not.

Requirement-based testing.

Requirements-based testing is a Symantec approach to test case design where you

- **Add lectures.**

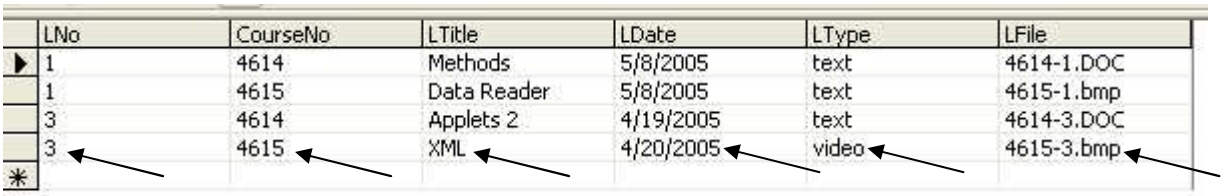
Test Set	Expected Result	Actual Result	Notes
Select a course then enter a lecture number, lecture title, lecture type, lecture date, and lecture file path.	Adding the new lecturer data to the system and making it available to the all users.	Adding the new lecturer data to the system and making it available to the all users.	Match
Select a course then enter all lecture data without lecture file path.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to	Match

		enforce Adding the file.	
Select a course then enter all lecture data without lecture type note.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to enforce Adding the type.	Match
Select a course then enter all lecture data without lecture number.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to enforce Adding the number.	Match
Select a course then enter the lecturer number as an existing number.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to enforce change the number?	Match

System Testing

- Add new lecture:

Figure 5.1: Adding new lecture web form



LNo	CourseNo	LTitle	LDate	LType	LFile
1	4614	Methods	5/8/2005	text	4614-1.DOC
1	4615	Data Reader	5/8/2005	text	4615-1.bmp
3	4614	Applets 2	4/19/2005	text	4614-3.DOC
3	4615	XML	4/20/2005	video	4615-3.bmp

Figure 5.2: lectures database table.

Acceptance Testing:

All system users' requirements are designed and implemented in an appropriate and simple way that makes the users interface and interaction with the system more easily and stably. The requirements designed interfaces are constructed from the natural and traditional work way of the users.

System Maintenance

After the system installed in its operational environment, we will be able to know about:

- How to updating the system site contents and design including adding new services, removing existents, or updating existents? : using the Visual Studio.Net environment and opening the web application in design environment.
- How to updating the system database (adding or deleting tables, rows, or columns)? : using the enterprise manager.
- How to backup the system site contents? : copying the web application folder from its location and saving it in some storage medium.
- How to backup the system database? : copying the database file from its location and saving it in some storage medium.
- How to contact with the system developers? : using their personal addressees' emails and mobiles numbers.

Recommendations

The project team recommend for the following works and enhancements on the system:

- Providing a mechanism of building an exam application that consist of the two questions types (text and multiple choice questions) and governs with specific period of time.
- Building a mechanism of exchanges notes and questions between students and lecturers through the use of mail server exchanges and building accounts for each student and lecturer.
- Providing new services in the system such as:
    - The ability of viewing the final students' results and marks.
    - Providing lectures in an audio and video conferencing form.

Also there are many others services and enhancements to be made on the system.

System Users Manual

This system has a four types of users each of them has a different privileges from other, these users are student, lecturer, administrator, and guest. So, appropriate manual will be presented to each user according to its privileges and services.

This manual presented in questions form of (How?)

Ex. **How to add new lecture?**

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Acknowledgment

Here, we will wait a moment of time to thank all whom have presented any thing to our project activities.

We deeply thank our supervisor Mr. Ala' Atawneh to his efforts in supervise our project stages and his ideas and advices.

We also present a thank to Mr. Wesam Al-Herbawi on his efforts and experiences that provides to us specially at the coding stage.

Also we don't forget to thank Dr. Mohammad Al-Dasht who gives us the main idea of this system project.

To all, thank you.

Project Team…

Chapter

1

System Specification

Chapter contents:

Introduction
Problem Definition
System Objectives
Functional Requirements Description
Non-Functional Requirements Description
System Constraints
Feasibility Study
Time Scheduling

Chapter One

System Specification

1.1 Introduction

Here, we will provide the specifications of the system to be built, such specifications are the topics that we will cover in this chapter:

- **Problem Definition**: why to build this system (University Academic Supporting System)?
- **System Objectives and importance**: what are the main objectives of the system and its importance?
- **Functional Requirements Specification**: the statements of services the system should provide
- **Non- Functional Requirements Specification**: requirements that are not directly concerned with the specific services or functions delivered by the system.
- **System Constrains:** the general and specific system constrains due to its woks and performs nature:
- **Feasibility Study**: explaining the most important alternatives faced the system and the project team, the economical study issues, and the evolution of risks that may be facing the development operation of the system.
- **Time Scheduling**: how the available time to be located to the system activities.

1.2 Problem Definition

According to the current evolution in the internet technology, according to our knowledge as university students of what is the most important academic issues that the students wants, and according to our knowledge as an information technology major's students of how to achieve these wants and requirements using the technology capabilities, we found that it is a good idea to invest these issues to develop a university academic supporting system; that serve and improve the academic operation within university.

1.3 System Objectives and Importance

The importance of the system comes from its main objective which is to serve and improve the academic operation at the university that consists of students, lecturers, and courses through the following:

- Taking the main advantages of the E-Learning concept since we can get the information without need to physical connection with its source.
- Providing the students with a diverse collection of learning styles:
    - Different types of lectures materials (text, audio, or video).
    - Two types of questions (multiple choice questions and text questions) that the students can answer on it in order to improve their understanding of their courses.
    - A mechanism of contact with their lecturers; through send questions or notes to them.
- Enabling lecturers to Contact with their students through:
    - Replying on the incoming students' questions or notes.
    - Sending advertisements on the courses to their students.
    - Evaluating their students' interaction and understanding; through evaluate their answers on text questions.

- Providing any guest to the system with many services such:
    - Online lectures materials for self learning.
    - Collection of multiple choice questions to be answered on it for self learning and evaluating.

1.4 Functional Requirements Description

The functional requirements are statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situation and they specify the functionality of the software that the developers must build into the product to enable the users to accomplish their tasks, thereby satisfying the students, lecturers, administrators, and any guest requirements.

The main user requirements that our system should provide are:

- **Online course lectures.**

  The system will provide many services on the courses lectures to its users according to theirs privileges. Both of lecturer and administrator users have the ability to viewing, adding, and deleting lectures material on course but the student and guest users have the ability of just viewing the available lectures material.

- **Course questions.**

  The system will provide two kinds of questions which are questions that required a text answers and questions that required choosing the answer from multiple choices provided. Only the lecturer user has the ability of viewing, adding, updating, and deleting these questions on his/her courses. The student can view and answer on the two questions kinds, but the guest user can view and answer on the multiple choice questions only.

- **Lecturers and students communication.**

  Through this service, both of students and lecturers can contact with each other through the mean of sending questions or notes from students to their lecturers and sending replies from lecturers to their students' questions.

- **Online advertisements.**

  The online advertisements will provide a mechanism of keeping students awareness with their courses news through sending advertisements by lecturers to their courses students. The lecturer user has the ability of viewing, adding, and deleting advertisements. The student user can only view the advertisements on his/her courses.

- **Administrative controls on users accounts.**

  The site administrator will be provided with a mechanism of controlling on the users accounts on the site (Students, Lecturers, and Administrators accounts), these controls including add, delete, deny, activate, or change password for any accounts.

Here, we will provide a more details for the previous users' requirements:

- **Login.**

Each lecturer, student, or administrator can login using username and password in order to get a secure login to the system and then has the ability to use the system services.

- **View the available online lectures.**

  Any user can view the available on line (video, text, or audio) lectures for any course in the University for the Self learning of different lectures materials including his/her lectures.

- **Add courses lectures materials.**

Each lecturer or administrator can add a course lectures to support students with course materials.

- **Delete courses lectures materials.**

Each lecturer or administrator can delete any lectures data or material from site or database since end of the time allowable to each lecture to be on line.

- **View Questions.**

Any user can view a multiple choice questions data and answering on it in order to self evaluating, but only the students can view the text questions and answering on it for the same previous reason.

- **Add Questions**

Each lecturer can add new questions data (Text and Choice questions), in order to support students understanding and interaction with their courses.

- **Update Questions.**

Each lecturer can update the questions data (Text and Choice questions),in order to refresh and making any adjustments to the questions data.

- **Delete Questions**

Each lecturer can delete any text or choice questions data to supporting add other questions.

- **Evaluate Students Answers.**

Each lecturer can evaluate students' answers on the text questions, in order to evaluate their understanding of their courses.

- **Ask Lecturers.**

Each student can send notes or questions to his/her lecturers on some courses.

- **Reply on Students.**

Each lecturer can send replies for the received questions or notes from his/her students, in order to contact with his/her students, and solve any ambiguous for them.

- **View advertisements.**

Each lecturer, student, or administrator can view the available advertisements data on different courses.

- **Add advertisements.**

Each lecturer or administrator can add new advertisements on courses, in order to keep students awareness of courses news or any others related news.

- **Delete advertisements.**

Each lecturer or administrator can delete any advertisement because end of advertisements allowable time to be on line.

- **View Users Accounts.**

Each Administrator can view the users' accounts data on the system, in order to make control on that accounts.

- **Add New Users Accounts.**

Each Administrator can add new users' accounts; these users are students, lecturers, or administrators.

- **Delete Accounts.**

Each Administrator can delete any users' accounts on the system.

- **Deny Accounts.**

Each Administrator can deny any users' accounts on the system, so the user cannot login to the system.

- **Activate Accounts.**

  Each Administrator can activate any denied users' accounts on the system, so the user can login to the system.

- **Change password.**

  Each lecturer, administrator, and student can change his/her password to increase the security of his/her login. But the administrator has also the privilege to change any other user's passwords.

- **Update the system design and contents.**

  Any administrator can make any updates on the system design and contents.

1.5 Non-Functional Requirements Description

Non-functional requirements are those that are not directly concerned with the specific services or functions delivered by the system, many of those non-functional requirements related to the system as a whole rather than to individual system features.

Normally, there are three classifications of the non-functional requirements, these are: product requirement, process requirements, and external requirements.

1.5.1 Product Requirements

These are requirements that specify the system behavior.

- **User friendly interface and ease of use**

  Our system is a user friendly interface system since the use of menus with a full meaning and familiarity text items to navigate between web forms, dropdown lists to view and select data from, buttons, hyperlinks, and

other graphical components that make the interface between the system and the user more friendly.

- **Flexibility**

  Students, lecturers, administrators, and any guest can access the site system from any where using any connected to the internet computer's browser since the using of ASP.NET technology with the .NET Framework which is a platform independent.

- **Availability**

  The site system services are available at any time and any where for any one, so students, lecturers, administrators, and any guest can visit it and take its services each with it's privileges.

- **Security**

  Our site system is a secure system since there are three pre made accounts students, lecturers, and administrators. So never some one to be authorized to access any accounts except its owner. Also there is another who can visit the site without a pre made account but as a guest with specific privileges.

- **Robustness**

  The system must provide a high level of robustness, such to be working the longest time before coming down, with a low percentage of events causing failure, and with a low probability of data corruption on failure.

- **Cultural and political**

  The system is to be performed and behave in a related environment and with specific users whom are university students, so it must be consider the cultural and political issues or guidelines that acts in its user's environment.

- **Consistency**

  Our system is a consistence system since all the comparable operations are to be activated or done in the same way at any time, so the system users never to be surprised by its behavior.

- **User guidance**

  Our system provides a meaningful feedback when errors occur and provide a context-sensitive user help facilities.

- **User diversity**

  Our system provides appropriate interaction facilities for different types of users, such lecturers, students, guests, and system administrators.

- **Learnability**

  On our system it doesn't take any new user long to become productive and effective with it.

1.5.2 Process Requirements

- The system and its documentation must be completed during 15 weeks.
- Any change in the system contents or database must be taken place at the same time that occurs at.
- Secure students, lecturers, and administrators' information such their numbers and passwords need to be kept confidential.

1.5.3 External Requirements

- All operations and services provided by this system are ethical and acceptable by its users and the general public.

- The system is to be interacting with the registration system in its university, gathering its required data about its users and academic data such courses data, students' majors, etc.
- Any user can visit the site system at anytime and from any where.
- System should provide high level of security for its users' information, and for its data including database data.

1.6 System Constraints

Here, we list the system constrains and restrictions in two categories, one concerned a bout the general system constrains ,the other concerned with the most specific system constrains due to its woks and perform nature:

1.6.1 General System Constrains

- Deliver the complete system in 15 weeks including the software part and the documentation of the system building processes.
- The system is be built and delivered within the cost amounts estimated in the feasibility study
- The system should be provide flexibility to make any changes or updates to its software or database, so it must be flexible for maintenance and evolution
- Any user using any browser should be able to brows the site system, so the system should be platform independent.

1.6.2 Specific system constrains

- To the required login users; user name must be unique and identical in order to gain higher levels of system accessing security.
- Each user who wants to access the site system as a student, a lecturer, or an administrator must be registered in the university for the current semester.
- Each user including guests can view all available lecturers on the site of

any course in the university.

- Each user including guests can view all available advertisements on the site of any course in the university.
- Each user including guests can view and answering on the available multiple choice answers questions on the site of any course in the university.
- Each user including guests can send notes, opinions, or suggestions about this site to the site administration.
- Each user including guests can get help about the site and how to using its contents.
- Only the currently registered students, lectures, and administrators can share the service of login to the system.
- Any authorized lecturer can perform add, delete, update, and view operations to some tables in database such Lectures table, Text Questions table, Reply on Students table, etc for only its courses and against only its students
- Only the authorized students can answer on a required text answer questions.
- Only the authorized students can send notes or questions to his/her lecturers only, and then can receive his/her reply and the shared reply.
- Each authorized student, lecturer, and administrator can change his login password.
- Only the authorized administrator can add, delete, update, and view any other authorized student, lecturer, and administrator account.
- Only the authorized administrator can view or delete guests notes on the site
- Only the authorized administrator can update the website design and content
- The advertisements materials, lectures materials, replies on students,

answers results, etc is to be available on line for a specific period of time a according to the university academic rules.

- The date format here is Month/Days/Year.
- There are a maximum number of characters allowable to some inputs, these are described in the following table:

Input/Field name	Maximum allowable characters
Multiple question text.	1000 characters.
Choice text.	500 characters.
Note on site text.	1000 characters.
Note sender's self description.	100 characters.
Student question to his/her lecturer.	1000 characters.
Lecturer reply to his/her student.	1000 characters.
Student answer on text question.	1000 characters.
Text question text.	1000 characters.
Text question answer text.	1000 characters.
Account Password	30 characters.

Table 1.1: Fields Size

1.7 Feasibility Study

The feasibility study stage will result in explaining the most important alternatives faced the system and the project team, the economical study issues, and the evolution of risks that may be facing the development operation of the system.

1.7.1 Alternatives

Here, we will talk about the most important alternatives that may be faced the system and the project team at the development stages of the system. These are:

- **Environment.**

  The environment of this system is to be university students, but Which University? Is it to be PPU or other university?

  We choose that the environment to be any university students, so our system to an open system not restricted to a specific university.

- **Skills.**

  In order to develop the system completely we need for many skills such programming and coding skills using appropriate programming language, web page designing skills, software engineering process understanding, and other skills.

  These skills may be available with many other people, but we found these skills available with us (the project team), so we decide to use it and starting developing the system.

1.7.2 Economical Study

During this study we will explain the system software, hardware, and human resources requirements; at development stage, and at operational stage.

1.7.2.1 At Development stage*:*

The following tables illustrate the hardware, software, and human requirements costs at the development stage of this system.

- **Hardware requirements:**

Item(s)	Type/Specification	cost
One personal computer device	Pentium 4, 2.7 GHz, cache 256KB, RAM 256 MB, Hard Disk 40GB, Floppy Drive 1.44MB, CD-ROM Drove 52x, Monitor16 800*600 resolution, and Keyboard and Mouse.	$ 500
Printer	Hp 3420	$50
Programming language material (book).	Developing Microsoft ASP.NET web application using Visual Studio.NET	$310
Total		**$860**

Table 1.2: Development Hardware Cost

- **Software requirements:**

Item(s)	Type/Specification	cost
Operating system.	Windows XP Professional with IIS Service	$200
Microsoft Internet Explorer	Microsoft Internet Explorer 6.0	$0
Data Base Server.	SQL server 2003	$100
Microsoft Office.	Microsoft Office XP	$60
Web application programming environment	Visual Studio.NET environment with VB.NET programming language.	$300
Capturing program.	CAPTURE ,SCRCAP2 MFC Application, version 1.0.0.1	$30
Microsoft Office Visio 2003	Microsoft Office Visio 2003	$60
Total		**$810**

Table 1.3: Development Software Cost

- **Human Requirements**

Item(s)	Type/Specification	cost
Software Engineer	Project team students	$110
Designer	Project team students	$110
Programmer	Project team students	$110
Tester/Inspector	Project team students	$110
Supervisor	Lecturer supervisor.	$110
Total		**$550**[1]

Table 1.4: Development Human Cost

1.7.2.2 At Operational Stage

The following tables illustrate the hardware, software, and human requirements costs at the operational stage of this system.

- **Hardware Requirements**

Item(s)	Type/Specification	cost
Server computer working as web server and Data Base server	Pentium 4, CPU at 1700 MHz, RAM 3GB, Hard Disk 100GB, CD-ROM D 52x, Monitor16, Keyboard and Mouse, and all network devices.	$3000
Network connection equipments	Cables, switches, hubs, NIC, router, ...	$2000
Total		**$5000**

Table 1.5: Operational Hardware Cost

[1] These costs come from the total payments on three credit hours of Graduation Project course from the project team.

- **Software Requirements**

Item(s)	Type/Specification	cost
Data Base server	SQL server 2000	$200
Operating System	Windows server 2003 with IIS	$200
Microsoft Internet Explorer	Microsoft Internet Explorer 6.0	$0
Microsoft Office	Microsoft Office 2003	$100
Working environment	.NET Framework 2003	$300
Domain Name	Domain Name	$200/Year
configured Internet connection	Leased line 64 MB	$1000
Total		**$2000**

Table 1.6: Operational Software Cost

- **Human Requirements**

Item(s)	Type/Specification	cost
Administrator	One of the university employee who responsible of web site management and maintenance.	$800/ semester
Total		**$800**

Table 1.7: Operational Human Cost

The Summary

- **Development stage costs:**

Requirements/Items	Total costs
Hardware Requirements	$860
Software Requirements	$810
Human Requirements	$550
Total	**$2220**

Table 1.8: Development stage costs

- **Operational stage costs:**

Requirements/Items	Total cost
Hardware Requirements	$5000
Software Requirements	$2000
Human Requirements	$800/ semester
Total	**$7800 / semester**

Table 1.9: **Operational stage costs**

1.7.3 Risk Evaluation

Here, the different risks that may appear during developing and installing the project and the possible solutions for them:

- Since this system is an open system it may be failed in meeting some of universities requirements, so we will provide a general requirements that are appropriate to any university.
- The available time to completely develop this system software with its documentation is about 15 week in a studying semester which is not an enough time, so we will provide a scheduling table of time to insure that the system to be completed in the given period of time.
- During the development time, errors or failures in both software and hardware are possible to be occurred, so a periodic backup of the system database and web application must be made.
- Since the system idea is not familiar for the all in our local area the users may found that using this system is so difficult and without actual benefits, so the university which decides to apply this system has to motivate and encourage their students and lecturers to use and visit this site.

1.7 Time Schedule

The system implementation time is about 15 weeks. These weeks are organized and arranged in a manner to not exceed the dead line of each task. Our work is shown in the following time schedule:

Task	Process	Weeks
T1	System planning and feasibility study	**2**
T2	Requirement collection and analysis	**2**
T3	System design	**3**
T4	Coding	**4**
T5	Implementation	**2**
T6	Testing	**2**
T7	Documentation	At each week(15)
Total		**15 weeks**

Table 1.10: Time scheduling table

- **Schedule Table**

The following table showing our weekly time scheduling:

Weeks / *Task*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
T1															
T2															
T3															
T4															
T5															
T6															
T7															

Table 1.11: Schedule chart.

Chapter

2

Software Requirements Specification

Chapter contents:

Introduction

Functional Requirement Specifications

Validation Criteria

Information Description

Chapter Two

Software Requirements Specification

2.1 Introduction

The following topics will be presented in this chapter:

- **Functional requirements specification**: Each requirement and function in the system will be specified in more details.
- **Validation criteria:** Here we will provide a description about the most important criteria that our system strongly takes care of. The standard and specifications will be provided**.**
- **Information description:** Here we will discuss many related issues such data flow between the system and its subsystems supported with Data Flow diagrams, listing all items that have been used in our system programming and coding stage such stored procedures and variables, and we will provide a description on each database table including each table specification keys, fields, types…

2.2 Functional Requirement Specifications

Here, we will describe the functional requirements in more detail.

- **Login**

Function: Login.

Description: Each lecturer, student, or administrator can login using username and password in order to get a secure login to the system and then has the ability to use the system services.

Inputs: user name and password

Source: login web form.

Output: allowing the authorized user to login on the site.

Destination: viewing the user web forms on the site.

Requires: Connection to the internet.

***Pre-condition*:** user without login to the site.

Post –condition: user with login to the site.

- **View the available online lectures.**

Function: View Lectures.

Description: Any user can view the available on line (video, text, or audio) lectures for any course in the University for the Self learning of different lectures materials including his/her lectures.

Inputs: course number.

Source: view course lectures web form.

Output: display the lectures on the web form.

Destination: display lectures data on web form.

Requires: Connection to the internet.

***Pre-condition*:** web form without lectures data.

Post –condition: web form with lectures data.

- **Add courses lectures materials.**

Function: Add lectures.

Description: Each lecturer or administrator can add a course lectures to support students with course materials.

Inputs: course number, lecture number, lecture title, lecture type, lecture date, and the lecture file path.

Source: adding lecture web form.

Output: new lectures data and lecture material published on site.

Destination: save data into lecture table in database and into web site.

Requires: Connection to the internet and login.

Pre-condition**:** no lecture data and material online.

Post –condition: lecture data and material online.

- **Delete course lectures**

Function: Delete lectures.

Description: Each lecturer or administrator can delete any lectures data or material from site or database since end of the time allowable to each lecture to be on line.

Inputs: course number, lecture number.

Source: deleting lecture web form.

Output: delete lectures data or lecture material from the site or database.

Destination: save changes into lectures table in database or and into the web site.

Requires **:** Connection to the internet and login.

Pre-condition**:** web site and database with previous lecture data and material.

Post –condition: web site and database without lecture data and material.

- **View Questions.**

Function: View Questions.

Description: Any user can view a multiple choice questions data and answering on it in order to self evaluating, but only the students can view the text questions and answering on it for the same previous reason.

Inputs: course number.

Source: viewing questions data web form.

Output: display questions data in the web form.

Destination: questions viewing web form

Requires: Connection to the internet.

***Pre-condition*:** questions viewing web form without questions data.

Post –condition: questions viewing web form with questions data.

Post –condition: database with questions data.

- **Add Questions**

Function: Add Questions.

Description: Each lecturer can add new questions data (Text and Choice questions), in order to support students understanding and interaction with their courses.

Inputs:

For Text Question: course number, question number, question text, question answer, and mark.

For Choice Question: course number, question number, question text, choice1, choice2, choice3, and correct choice.

Source: adding questions data web form.

Output: new questions data on the system.

Destination: saving the new questions data on the system.

***Requires* :** Connection to the internet and login.

***Pre-condition*:** system without questions data.

Post –condition: system with questions data.

- **Update Questions.**

Function: update text question.

Description: Each lecturer can update the questions data (Text and Choice questions), in order to refresh and making any adjustments to the questions data.

Inputs:

For Text Question: new question text, new ideal answer, or new question mark.

For Choice Question: new text, new choices, or new correct choice.

Source: lecturer's updating text exam's questions data web form.

Output: new text exam's questions data in Text Questions exams table.

Destination: saving the new text exam's questions data in Text Questions exams table.

Requires **:** Connection to the internet and lecturers login.

Pre-condition**:** database with old text questions data.

Post –condition: database with text questions data.

- **Delete Questions**

Function: Delete text question.

Description: Each lecturer can delete any text or choice questions data to supporting add other questions.

Inputs: course number, question number.

Source: deleting questions data web form.

Output: delete questions data from the system.

Destination: saving the result on the system.

Requires: Connection to the internet and login.

Pre-condition**:** system with questions data.

Post –condition: system without questions data.

- **Evaluate Students Answers.**

Function: Evaluate Answers.

Description: Each lecturer can evaluate students' answers on the text questions, in order to evaluate their understanding of their courses.

Inputs: course number, question number, student number, and student mark.

Source: evaluating student's answers web form.

Output: Student's evaluated answer.

Destination: saving the evaluated student's answer data on student's questions answers table.

Requires: Connection to the internet and lecturers login.

***Pre-condition*:** Student's answers without evaluating.

Post –condition: Student's answers with evaluating.

- **Ask Lecturers.**

Function: Ask Lecturers.

Description: Each student can send notes or questions to his/her lecturers on some courses.

Inputs: lecturer number, course number, question number, and question or note text.

Source: students ask lecturers web form.

Output: question or note sends to the lecturer.

Destination: save the question or note data to the questions and notes exchanges (QAndNotesExchanges) table.

Requires: Connection to the internet and student login.

***Pre-condition*:** questions and notes exchanges (QAndNotesExchanges) table without notes or questions to lecturers.

Post –condition: questions and notes exchanges (QAndNotesExchanges) table with notes or questions to lecturers.

- **Reply on Students.**

Function: Send Replies.

Description: Each lecturer can send replies for the received questions or notes from his/her students, in order to contact with his/her students, and solve any ambiguous for them.

Inputs: course number, question number, student number, and reply text.

Source: lecturer's replies on students web form.

Output: New reply.

Destination: Save the reply data on questions and notes exchanges table.

Requires **:** Connection to the internet and lecturers login.

Pre-condition**:** Database without reply data.

Post –condition: Database with reply data.

- **View Advertisements.**

Function: View Advertisement.

Description: Each lecturer, student, or administrator can view the available advertisements data on different courses.

Inputs: course number.

Source: viewing advertisement data on web form.

Output: Display advertisement data.

Destination: Display advertisement data on web form.

Requires **:** Connection to the internet and login.

Pre-condition**:** web form without advertisement data.

Post –condition: web form with advertisement data.

- **Add advertisements.**

Function: Add advertisement.

Description: Each lecturer or administrator can add new advertisements on courses, in order to keep students awareness of courses news or any others related news.

Inputs: course number, advertisement number, advertisement date, advertisement title, and advertisement text.

Source: adding advertisement data on web form.

Output: new advertisement.

Destination: saving the new advertisement data in course advertisement table.

Requires **:** Connection to the internet and login.

Pre-condition**:** database without advertisement data.

Post –condition: database with advertisement data.

- **Delete advertisements.**

Function: Delete advertisement.

Description: Each lecturer or administrator can delete any advertisement because end of advertisements allowable time to be on line.

Inputs: course number, advertisement number.

Source: deleting advertisement data on web form.

Output: Delete advertisement data.

Destination: saving the result of the deleted advertisement function in course advertisement table.

Requires **:** Connection to the internet and login.

Pre-condition**:** database with old advertisement data.

Post –condition: database without advertisement data.

- **View Users Accounts.**

Function: View Accounts.

Description: Each Administrator can view the users' accounts data on the system, in order to make control on that accounts.

Inputs: decides and selects to view users' accounts.

Source: Administrator viewing users' accounts web form.

Output: users' accounts data to be displayed.

Destination: viewing the users' accounts data onto the administrator viewing users' accounts web form.

Requires: Connection to the internet and administrator login.

***Pre-condition*:** administrator viewing users' accounts web form without lecturers' account data.

***Post-condition*:** administrator viewing users' accounts' web form with lecturers' account data.

- **Add New Users Accounts.**

Function: Add Users Account.

Description: Each Administrator can add new users' accounts; these users are students, lecturers, or administrators.

Inputs: user name, password, and state.

Source: Administrator adding new administrator account web form.

Output: new user account.

Destination: saving the new user account data into the users (users) table.

Requires: Connection to the internet and administrator login.

***Pre-condition*:** system and (users) table without new user account data.

***Post-condition*:** system and (users) table with new user account data.

- **Delete Accounts.**

Function: Delete Account.

Description: Each Administrator can delete any users' accounts on the system.

Inputs: administrator number.

Source: Administrator deleting users' accounts web form.

Output: deleting user account.

Destination: saving the new changes on users' accounts data into the users accounts (users) table.

Requires: Connection to the internet and administrator login.

***Pre-condition*:** system and (users) table with some user account data.

***Post-condition*:** system and (users) table without some user account data.

- **Deny Accounts.**

Function: Deny Accounts.

Description: Each Administrator can deny any users' accounts on the system, so the user cannot login to the system.

Inputs: account number or select all accounts' numbers.

Source: Administrator denying users' accounts web form.

Output: users' account is denied from access the system site.

Destination: the users' login (users) table become has a flag on the denied accounts.

Requires: Connection to the internet and administrator login.

***Pre-condition*:** a user account with an activated account to access the system site.

***Post-condition*:** a user account with a denied account to access the system site.

- **Activate Accounts.**

Function: Activate Accounts.

Description: Each Administrator can activate any denied users' accounts on the system, so the user can login to the system.

Inputs: account number or select all accounts' numbers.

Source: Administrator activating users' accounts web form.

Output: user account is activated to be able access the system site.

Destination: the users (users) table become without a denied flag to the account.

Requires: Connection to the internet and administrator login.

***Pre-condition*:** user account with a denied account from access the system site.

***Post-condition*:** user account with an activated account to access the system site.

- **Change password.**

Function: Chang Password.

Description: Each lecturer, administrator, and student can change his/her password to increase the security of his/her login. But the administrator has also the privilege to change any other user's passwords.

Inputs: user name, old password, new password, and confirm new password.

Source: user changing password web form.

Output: new password.

Destination: users table in DB.

Requires: Connection to the internet and login.

***Pre-condition*:** user account with old password.

***Post-condition*:** user account with new password.

- **Update the system design and contents.**

Function: Update The Site.

Description: Any administrator can make any updates on the system design and contents.

Inputs: decide to update the site system.

Source: any administrator web form.

Output: updated site design and contents.

Destination: applying the new updates made on the site as a hole.

Requires: Connection to the internet and administrator login.

Pre-condition**:** site system with an old design or contents.

Post –condition: site system with a new design or contents.

2.3 Validation Criteria

Here we will provide a description about the most important criteria that our system strongly takes care of.

- **Login User Name**: students, lecturers, and administrators login process required user names which represent their number that is to be provided by the university, so the validation criterion on this number is to be the same as it in the university registration system. The required login users must be registered in the university at the current semester.
- **Login password**: The required login users need a password within the number to login. There is no constrains on the password format excepted that it must be at least four characters length and 30 as maximum, so it may be numeric, characters, or mixture data.
- **Database access**: only the authorized users have the ability of accessing the system database each with its permissions: insert, delete, update, or view permissions.

2.4 Information Description

Here we will discuss many related issues such data flow between the system and its subsystems supported with Data Flow diagrams, listing all items that have been used in our system programming and coding stage such stored procedures and variables, and we will provide a description on each database table including each table specification keys, fields, types… etc.

2.4.1 System Data Flow Diagram (DFD)

- **Lectures Processes (DFD)**

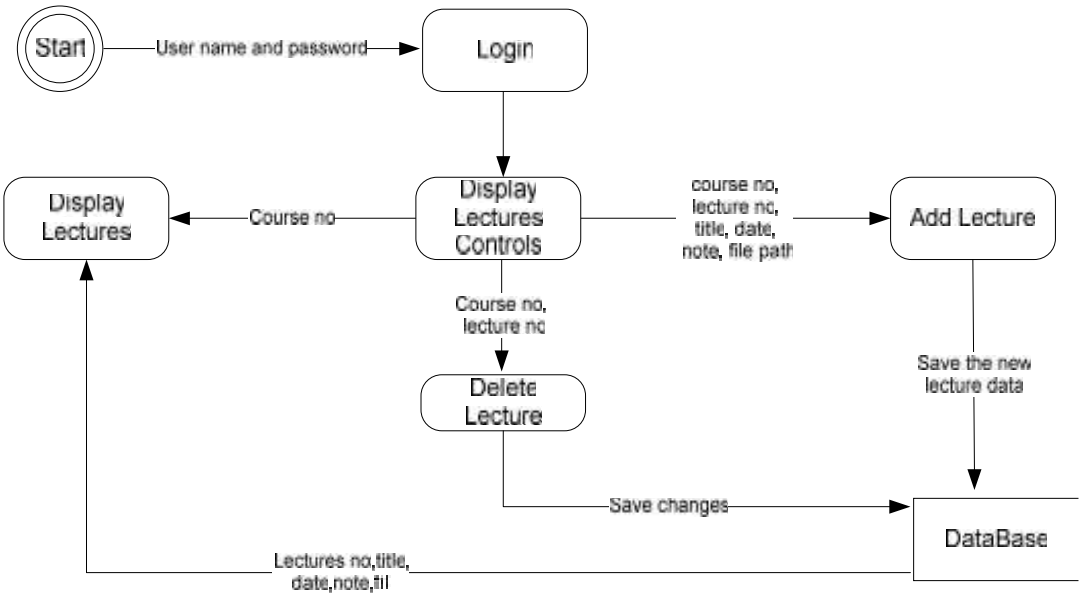

Figure 2.1 Lectures Processes (DFD)

- **Advertisements Processes (DFD)**

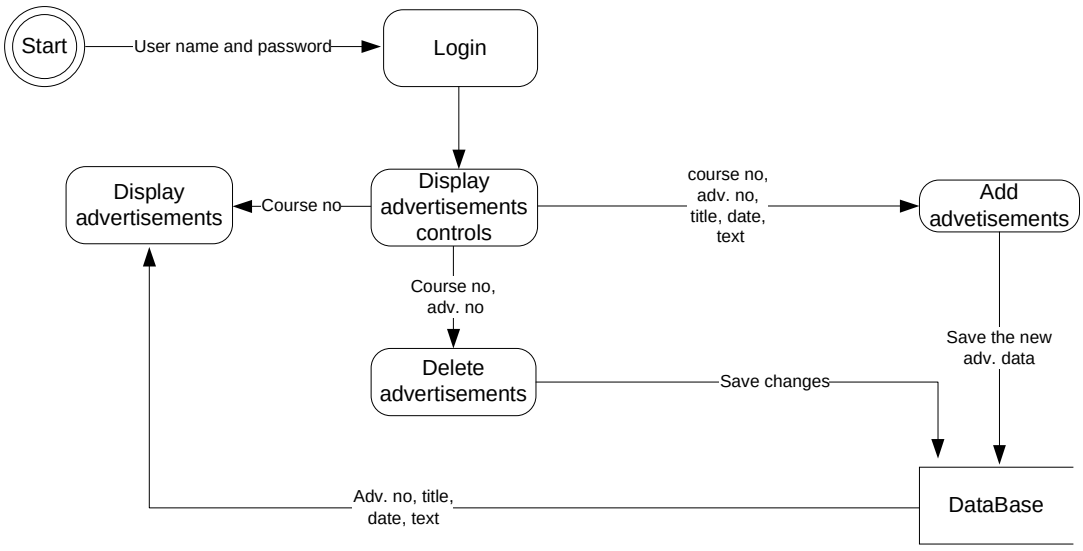

Figure 2.2 Advertisements Processes (DFD)

- **Text Questions Processes (DFD)**

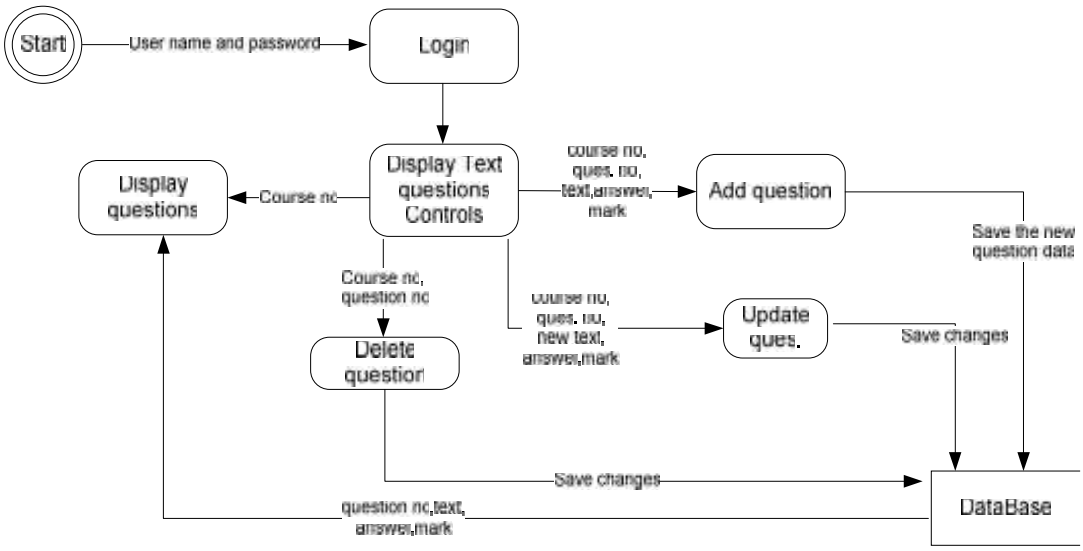

Figure 2.3 Text Questions Processes (DFD)

- **Choice Questions Processes (DFD)**

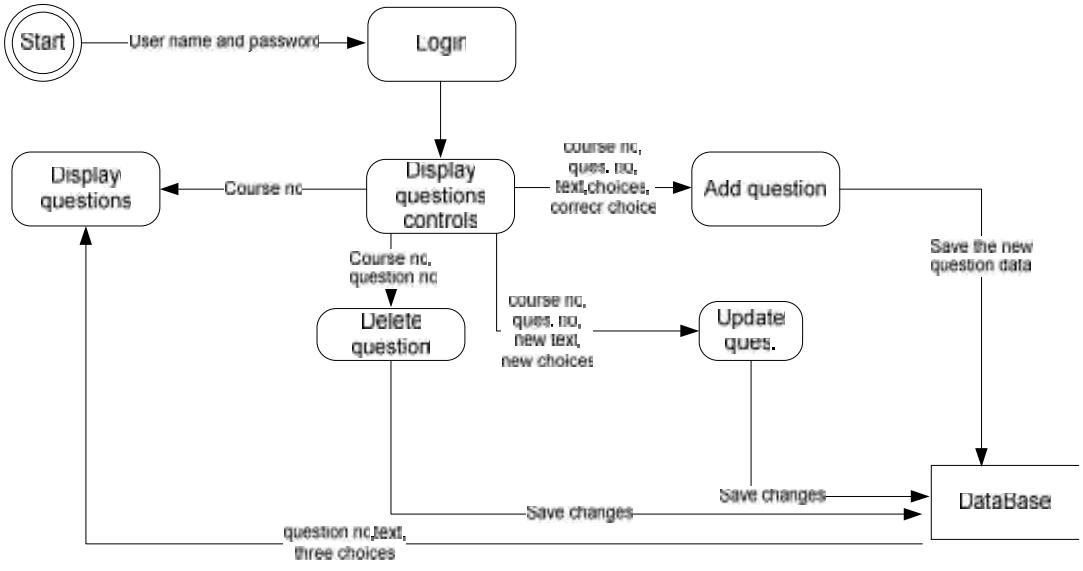

Figure 2.4 Choice Questions Processes (DFD)

- **Student Ask Lecturer**

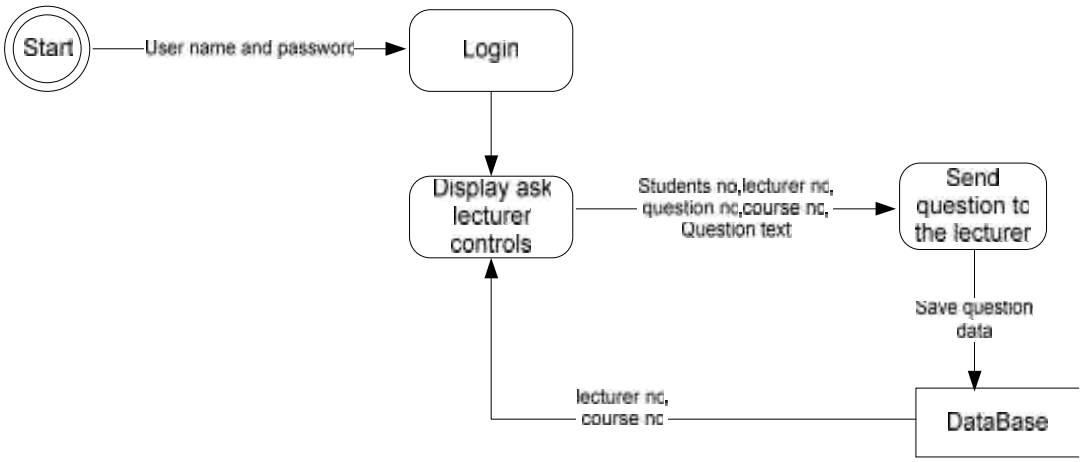

Figure 2.5 Ask Lecturer Processes (DFD)

- **Lecturer Reply on Students Questions Processes (DFD)**

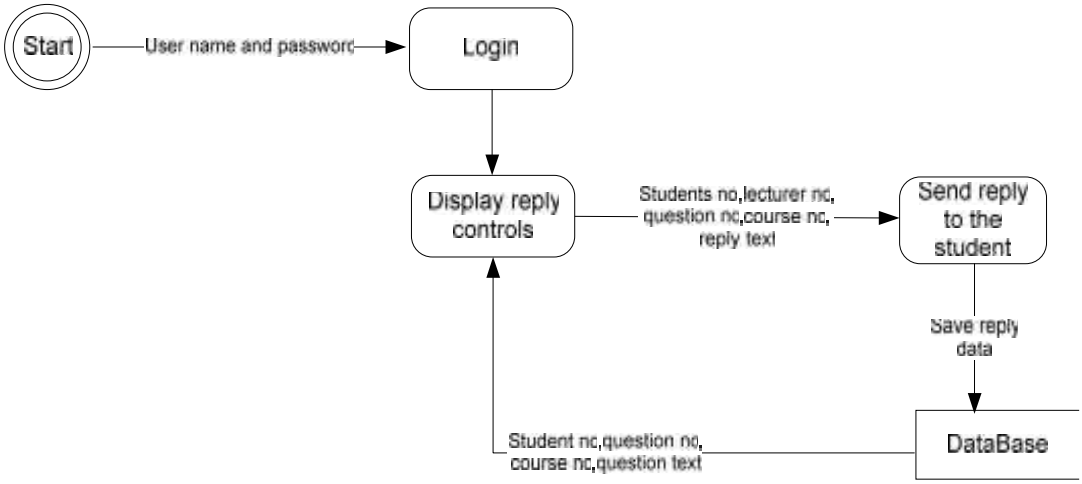

Figure 2.6 Reply Processes (DFD)

- **Administrator Processes (DFD)**

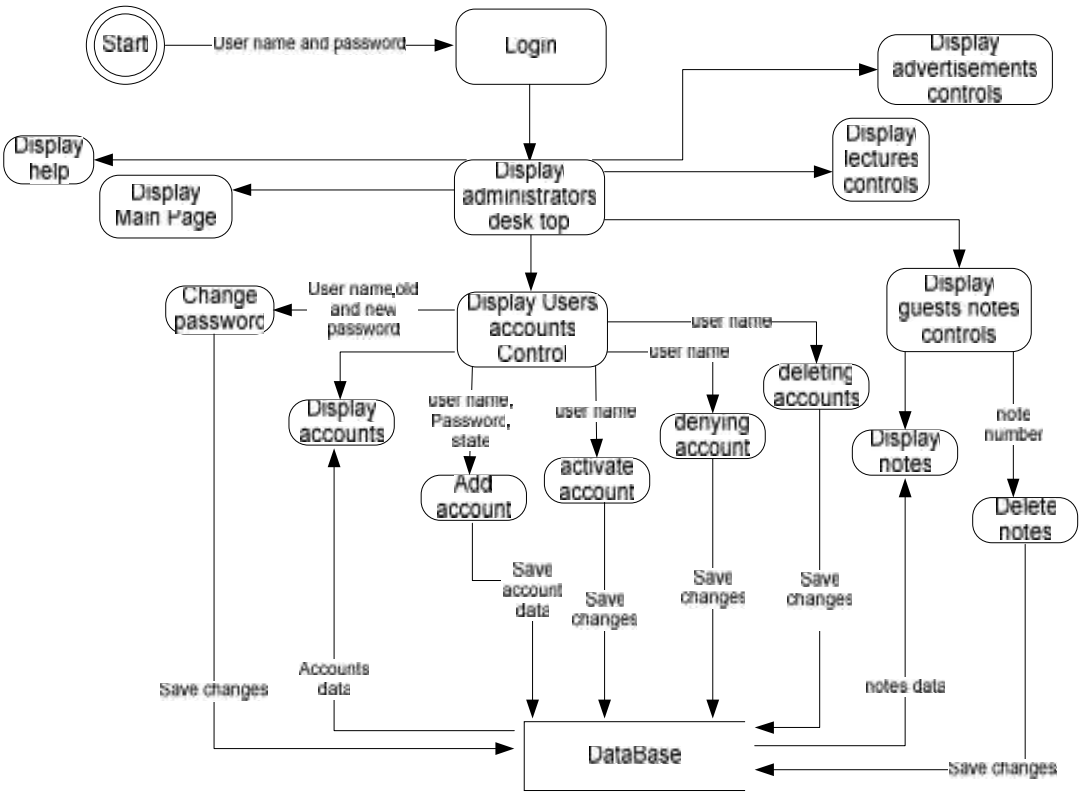

Figure 2.7 Administrator Processes (DFD)

- **Lecturer Processes (DFD)**

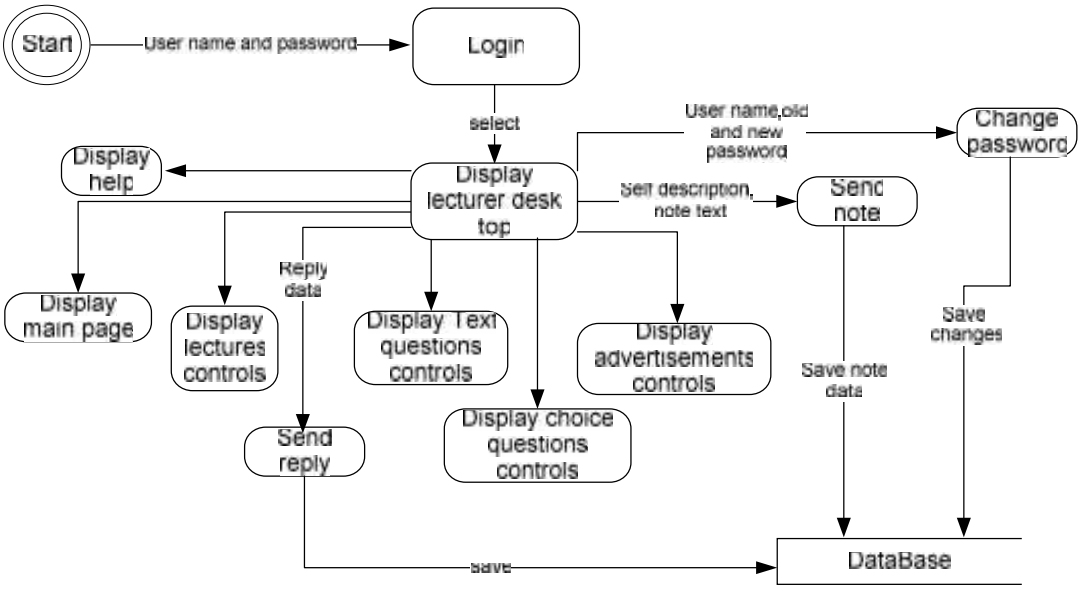

Figure 2.8 Lecturer Processes (DFD)

- **Student Processes (DFD)**

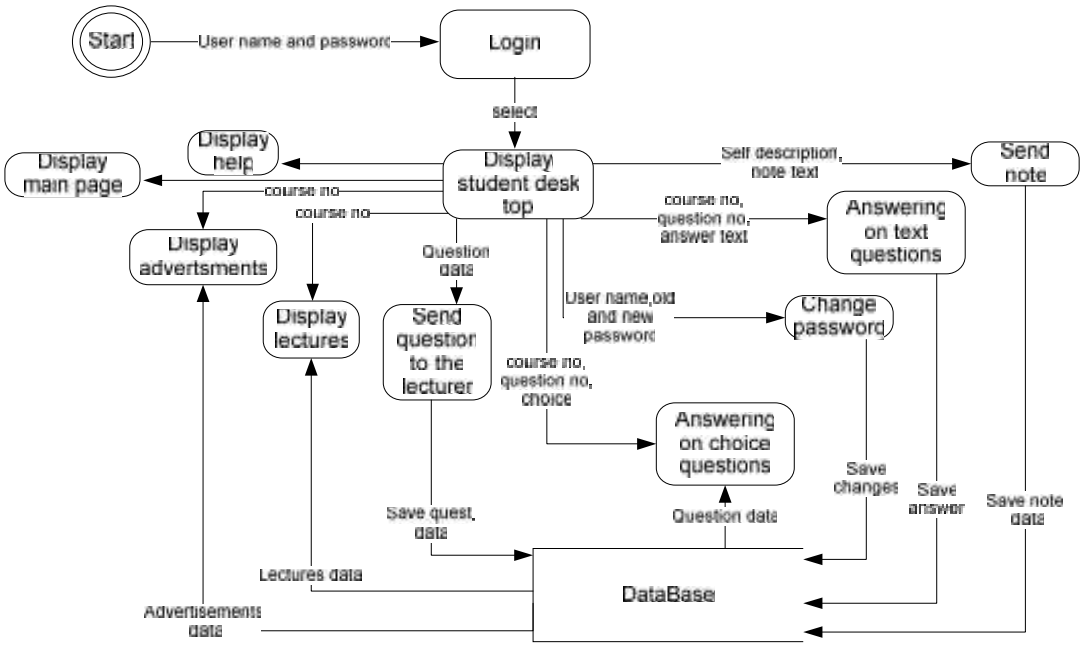

Figure 2.9 Student Processes (DFD)

- **Guest Processes (DFD)**

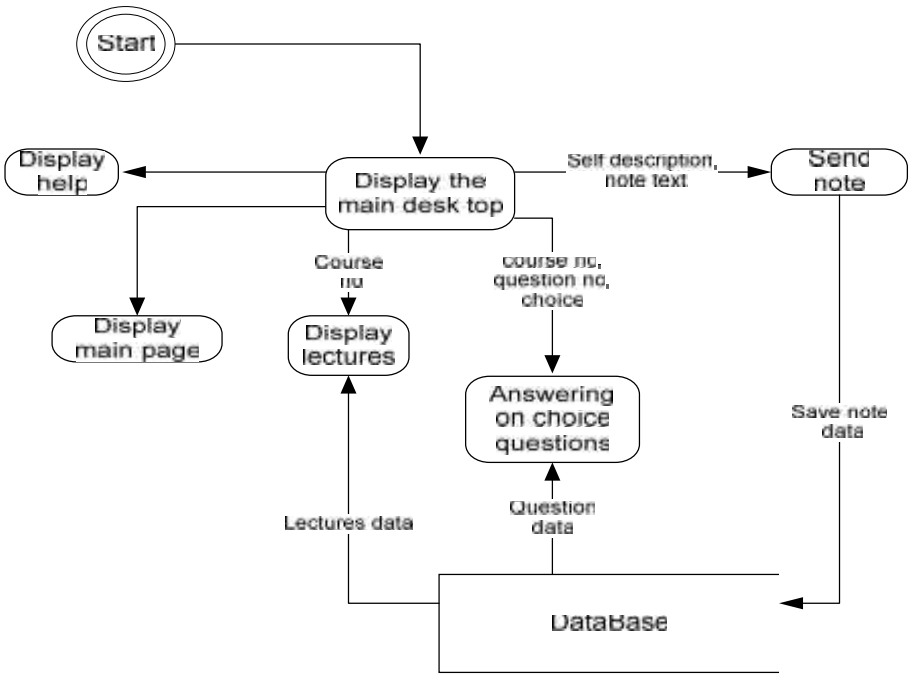

Figure 2.10 Guest Processes (DFD)

2.4.2 Data Dictionary

Here, we will list all items that have been used in our system programming and coding stage, such items as stored procedures, session variables, or any other variables. These are listed in the following table:

Entity name	Type	Description
StudentLecturers	Stored Procedure	This procedure returns both the number and name of the lecturers whom teaching the student, where the procedure input parameter is the student number.
StudentCourses	Stored Procedure	This procedure returns both the number and name of the courses that the student studying it, where the procedure input parameter is the student number.
LecturerCourses	Stored Procedure	This procedure returns both the number and name of the courses that the lecturer teaching it, where the procedure input parameter is the lecturer number.
DisplayStdQTAns	Stored Procedure	This procedure displays the student answers on the text questions, where the procedure input parameter is the course and question number.
DisplayLecQT	Stored Procedure	This procedure displays the text questions data to the lecturer, where the procedure input parameter is the course number.
DisplayStdTQ	Stored Procedure	This procedure displays the text questions

		data in order to answering on it by the student, where the procedure input parameter is the course number.
StdTQResult	Stored Procedure	This procedure displays the student's answer result on text questions including the mark, where the procedure input parameter is the course and student number.
SaveLecReply	Stored Procedure	This procedure save the lecturer reply on its students, where the procedure input parameter is the reply text, course number, student number and question number.
SaveStdTQAns	Stored Procedure	This procedure save the student answer on text questions, where the procedure input parameter is the answer text, course number, student number and question number.
DisplayAllCourses	Stored Procedure	This procedure displays all courses, where there is no input parameter.
DisplayLectures	Stored Procedure	This procedure displays all courses that have lectures on it, where there is no input parameter.
UsersLogin	Stored Procedure	This procedure returns the users accounts data to login, where there is no input parameter.
DisplayLecStdQ	Stored Procedure	This procedure displays students' questions data that come to the lecturer, where there

		is no input parameter.
SaveToAllReply	Stored Procedure	This procedure save the lecturer reply that generalized to all students, where the procedure input parameter is the question text, reply text, and course number.
StdCorLect	Stored Procedure	This procedure displays the students' courses with a lecturer, where input parameters are lecturer number and student number.
SendQtoLec	Stored Procedure	This procedure stores the students' questions to their lecturer, where input parameters are lecturer, student, course, question number, and question text.
Session("StudentNo")	Varchar	This session variable holds the login student number.
Session("LecturerNo")	Varchar	This session variable holds the login lecturer number.
Session("AdminNo")	Varchar	This session variable holds the login administrator number.
Session("CNo")	Varchar	This session variable holds a course number to be used in different queries and statements.
Session("QNo")	Varchar	This session variable holds a question number to be used in different queries and statements.

Session("Result")	Varchar	This session variable holds the student mark when answering on multiple choice questions.
Session("TQCourseNo")	Varchar	This session variable holds the number of the course that has a text question on it, used when answering on text question.
Session("MCQCourseNo")	Varchar	This session variable holds the number of the course when answering on multiple choice questions.
Session("ReplyCNo")	Varchar	This session variable holds the number of the course on which the lecturer replies on his/her students' questions.
Session("correctchoice")	Varchar	This session variable holds the correct choice number when answering on the multiple choice questions.
Session("QText")	Varchar	This session variable holds the student question text, used when the lecturer replies on his/her students' questions.
Session("SQno")	Varchar	This session variable holds the student question number, used when the lecturer replies on his/her students' questions.
Session("stdno")	Varchar	This session variable holds the student number, used when the lecturer replies on his/her students' questions.

QText	TextBox	Define QText as a text box control to be used in updating text questions.
QCorrectAnswer	TextBox	Define QCorrectAnswer as a text box control to be used in updating text questions.
QMarke	TextBox	Define QMarke as a text box control to be used in updating text questions.
QNo	TextBox	Define QNo as a text box control to be used in updating text questions.
QText	TextBox	Define QText as a text box control to be used in updating multiple choice questions.
Choice1	TextBox	Define Choice1 as a text box control to be used in updating multiple choice questions.
Choice2	TextBox	Define Choice2 as a text box control to be used in updating multiple choice questions.
Choice3	TextBox	Define Choice3 as a text box control to be used in updating multiple choice questions.
CorrectChoice	TextBox	Define CorrectChoice as a text box control to be used in updating multiple choice questions.
FillDG()	sub procedure	Used to fill and bind data to a Data Grid.

Table 2.1: Data Dictionary

2.4.3 Database Data Dictionary

Here, we provide a description on each database table including each table specification keys, fields, types…

The following table illustrates the system database tables gives the table name and a briefly description about each table:

Table Name	Description
Users	This table contains the system users accounts data (students, lecturers, and administrators) such theirs users name and passwords.
CourseAdv	(Course's Advertisements)This table contains data about the courses' advertisements such titles, texts, and date.
Courses*	This table contains information about the listed courses in the current semester such course no and course name.
Colleges*	This table contains the university colleges data such college no and college name.
Departments*	This table contains the departments data such department no, name, and its college no.
Lecturers*	This table contains data about the lecturers whom teaches in the current semester such lecturer no and name.
LecturersAndCourses *	This table shows the courses that the lecturer teaches and in which majors and sections.

Lectures	This table contains data about the available on line courses' lectures such titles and dates.
Majors*	This table contains information about the listed majors in the current semester such major no and major name.
MultipleChoiceQuestions	This table contains data of the multiple choice answers questions that provided by the lecturer on his/her courses and presented to the students to answering on it.
NotesForSiteAdmin	This table contains data about the incoming notes or opinions on the site such note no and text.
QAndNotesExchanges	This table contains data about the students' questions that presented to their lecturers and data about the lecturers replies.
StdTQAns	(Student Text Question Answer)This table contains data about the students' answers on the required text answers' questions such the answers texts and marks.
Students*	This table contains data about the students whom studied and registered in the current semester such student no, name, and major.
StudentsAndCourses *	This table shows the courses that each student registered to and his/her section.
TextQuestions	This table contains data of the required text

	answers questions that provided by the lecturer on his/her courses and presented to their students to answering on it.
ToAllAns	(To All Answers)This table contains data about the lectures' replies that they want to generalize it to the course students.

Table 2.2: Database Tables

* Our system is not intended with inserting or deleting data from these tables because it comes from the registration system in the university. So we are concerned only with reading data from it.

1. Users

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
UserName	represent the user number	nvarchar 10	no	yes	no	
Password	represent the user password	nvarchar 30	no	no	no	
Type	represent the user type(Student(s), Lecturer(l), or Administrator(a))	char 1	no	yes	no	
Denied	determine whether this user account is denied or activated.	int 4	no	no	no	

Table 2.3: Administrators Login table

2. CoursesAdv

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
CNo	course number	int4	no	yes	yes	3
ANo	advertisement password	int4	no	yes	no	
ATitle	advertisement title	nvarchar 200	yes	no	no	
AText	advertisement text	nvarchar 1000	yes	no	no	
ADate	advertisement date	datetime 8	yes	no	no	

Table 2.4: Courses Advertisements table

3. Courses

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
CNo	course number	int4	no	yes	no	
CName	course name	nvarchar 50	no	no	no	

Table 2.5: Courses table

4. Colleges

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
CollegeNo	college number	int4	no	yes	no	
CName	college name	nvarchar 150	no	no	no	

Table 2.6: Colleges table

5. Departments

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
DNo	department number	int4	no	yes	no	
DName	department name	nvarchar 100	no	no	no	
CollegeNo	college number	int4	no	no	yes	4

Table 2.7: Departments table

6. Lecturers

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
LNo	lecturer number	int4	no	yes	no	
LName	lecturer name	nvarchar 200	no	no	no	

Table 2.8: Lecturers table

7. LecturersAndCourses

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
LNo	lecturer number	int4	no	yes	no	
CourseNo	course number	int4	no	yes	yes	3
MajorNo	major number	int4	no	yes	yes	9
SectionNo	section number	int4	no	yes	no	

Table 2.9: Lecturers and Courses table

8. Lectures

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
LNo	lectures number	int4	no	yes	no	
CourseNo	lecture's course number	int4	no	yes	yes	3
LTitle	lectures title	nvarchar 50	yes	no	no	
LDate	lectures date	datetime 8	yes	no	no	
LType	lectures type	nvarchar 50	no	no	no	
LFile	lectures file name	nvarchar 50	yes	no	no	

Table 2.10: Lectures table

9. Majors

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
MNo	major number	int4	no	yes	no	
MName	major name	nvarchar 100	no	no	no	
DeptNo	department number	int4	no	no	yes	5

Table 2.11: Majors table

10. MultipleChoiceQuestions

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
QNo	question number	int 4	no	yes	no	
CourseNo	course number	int 4	no	yes	yes	3
QText	question text	nvarchar 1000	no	no	no	
Choice1	choice1 text	nvarchar 500	no	no	no	
Choice2	choice2 text	nvarchar 500	no	no	no	
Choice3	choice3 text	nvarchar 500	no	no	no	
CorrectChoice	correct choice A, B, or C	char1	yes	no	no	

Table 2.12: Multiple Choice Questions table

11. NotesForSiteAdmin

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
NoteNo	note number	int4	no	yes	no	
Position	self description					
NoteText	note text	nvarchar 1000	no	no	no	

Table 2.13: Notes on Site table

12. QAndNotesExchanges

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
QNo	question number	int4	no	yes	no	
LecturerNo	the asked lecturer number	int4	no	yes	yes	6
CourseNo	course number	int4	no	yes	yes	3
QText	question text	nvarchar 1000	no	no	no	
StdNo	the asker student number	numeric 9	no	yes	yes	15
ReplyText	lecturer reply text	nvarchar 1000	yes	no	no	

Table 2.14: Questions and Notes Exchanges table

13. StdTQAns

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
QNo	question number	int4	no	yes	no	
LecturerNo	the asked lecturer number	int4	no	yes	yes	6
CourseNo	course number	int4	no	yes	yes	3
QText	question text	nvarchar 1000	no	no	no	
StdNo	the asker student number	numeric 9	no	yes	yes	15
ReplyText	lecturer reply text	nvarchar 1000	yes	no	no	

Table 2.15: Students Answers on Text Questions table

14. Students

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
SNo	student number	numeric 9	no	yes	no	
SName	student name	nvarchar 100	no	no	no	
MajorNo	student major number	int4	no	no	yes	10

Table 2.16: Students table

15. StudentsAndCourses

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
StdNo	student number	numeric 9	no	yes	no	
CourseNo	course number	int4	no	yes	yes	3
SectionNo	student section number	int4	yes	no	no	

Table 2.17: Students and Courses table

16. TextQuestions

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
CourseNo	course number	int4	no	yes	yes	3
QNo	question number	int4	no	yes	no	
QText	question text	nvarchar 1000	no	no	no	

QCorrectAnswe	question correct/ideal answer	nvarchar 1000	yes	no	no	
QMarke	question marke	numeric 9	yes	no	no	

Table 2.18: Text Questions table

17. ToAllAns

Column Name	Illustration	Data Type	Allow Nulls	Primary Key	Foreign Key	Related Tables No.
QNo	question number	int 4	no	yes	no	
QText	question text	nvarchar 1000	yes	no	no	
AnsText	answer text	nvarchar 1000	yes	no	no	
CNo	course number	int 4	no	no	yes	3

Table 2.19: To All Answers table

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Chapter 3

System Design

Chapter contents:

Introduction.

Database Design Model.

Functional Design.

Test Plan.

Chapter Three

System Design

Chapter Three

System Design

3.1 Introduction

System design process concerned with designing the system functions to be implemented later. Here we are follow the functional oriented design process, where each function of the system will be designed.

The following topics will be covered in this chapter

- **Database design**: here we will provide the Entity Relationship Model (ER Model) of the system database.
- **System data flow diagrams**: here, we will provide an illustration of how data flow between the system functions in each subsystem and in overall system using the data flow diagrams.
- **Functions design**: here, each function of the system will be designed, for each function there are flow chart, its interface (Input/Output), constraints, and user interface I/O screen.
- **Test plan**: here, a test plan for the testing processes that may used and its estimated time schedule will be provided.

3.2 Database Design

Since the database is one of the most important parts of the system, it must be designed carefully in order to be implemented in correct manner. In system requirements specification (chapter tow) we provide the database data dictionary that includes all tables, its specifications, Keyes, columns…, here we will provide the Entity Relationship Model (ER Model) of the system database.

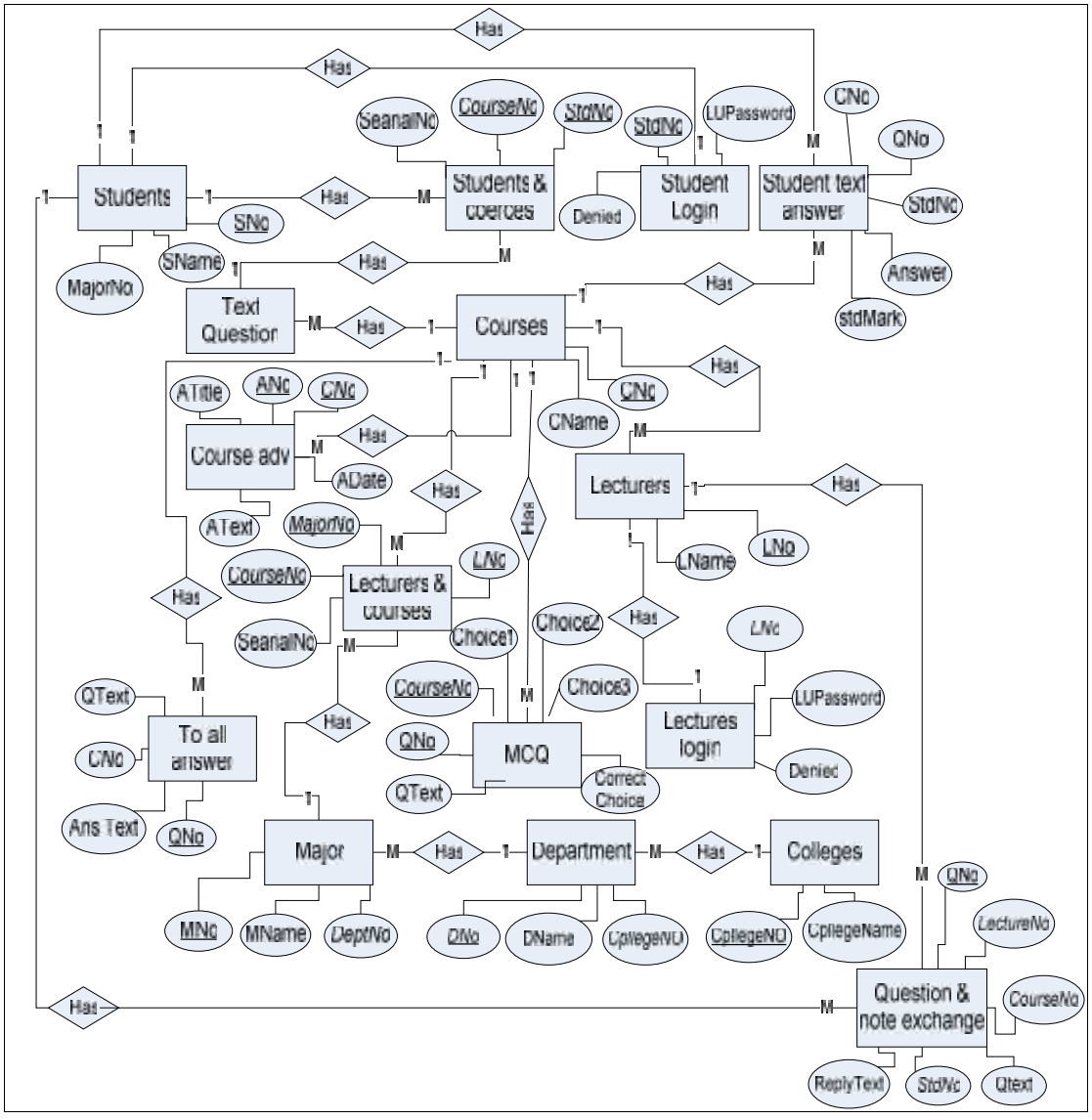


Figure 3.1: Database ER Model

3.3 Data Flow Diagram

Here, we will provide an illustration of how data flow between the system functions in each subsystem and in overall system, so we use the data flow diagrams for that.

3.3.1 Administrator process.

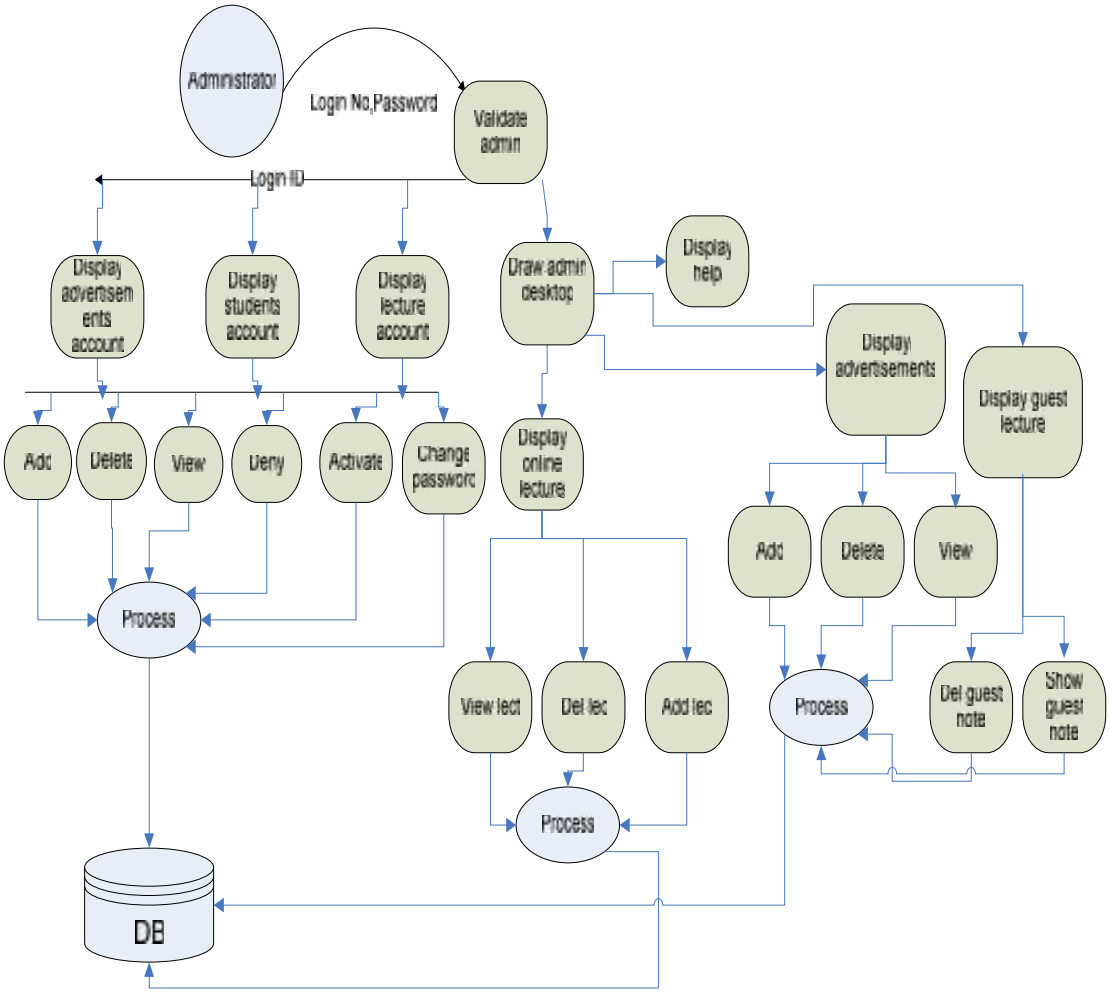


Figure 3.1 administrator data flow diagram

3.3.2 Lecturer process.

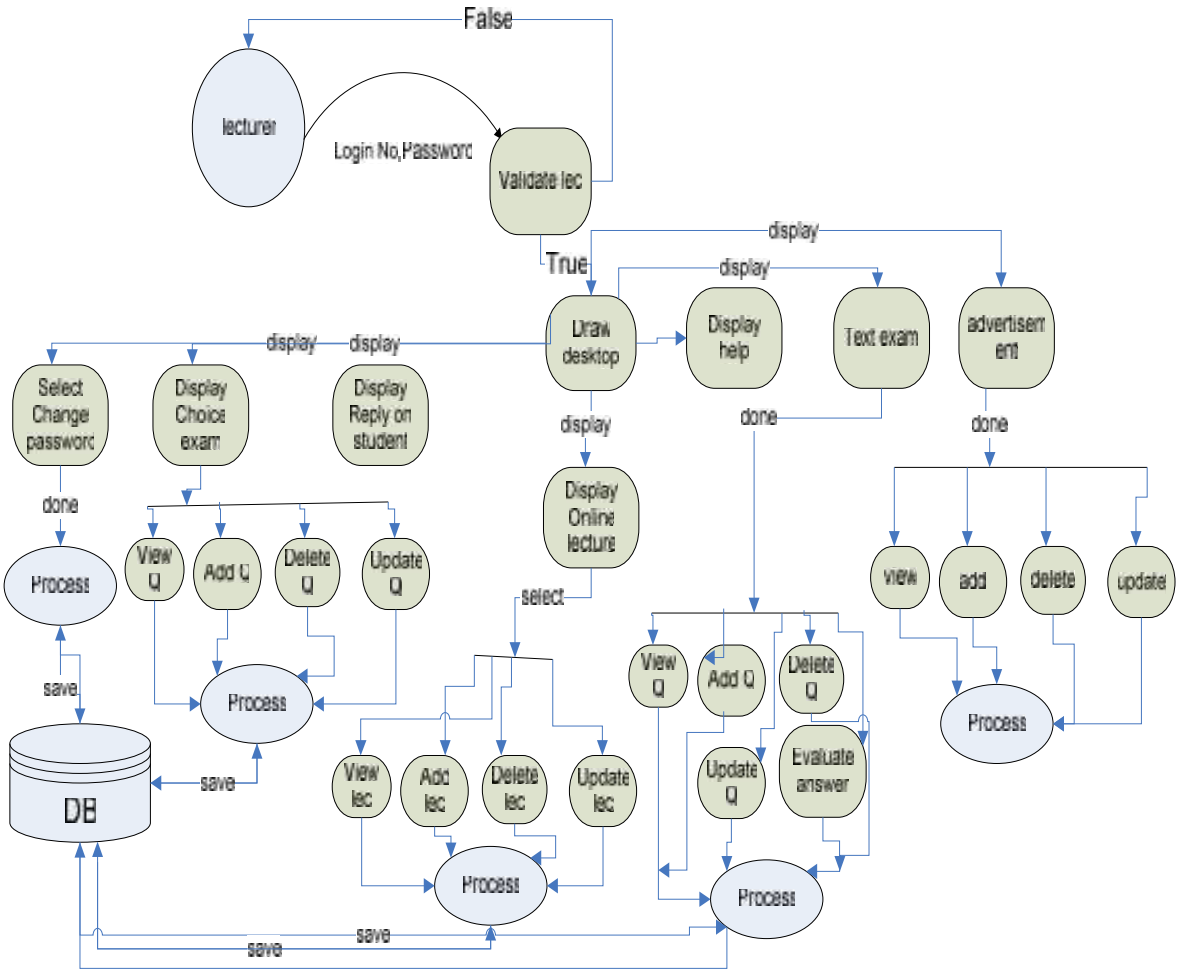


Figure 3.2: Lecture data flow diagram

3.3.3 Student process.

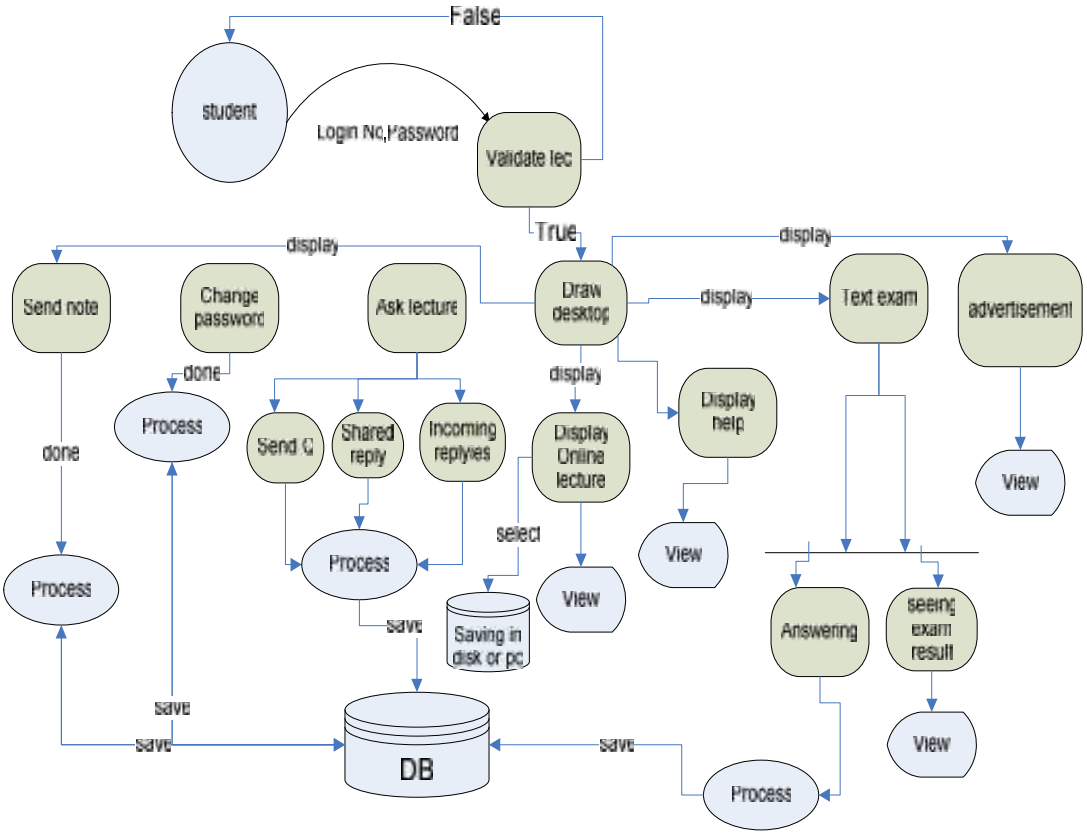


Figure 3.3 Students data flow diagram

3.3.4 System architecture

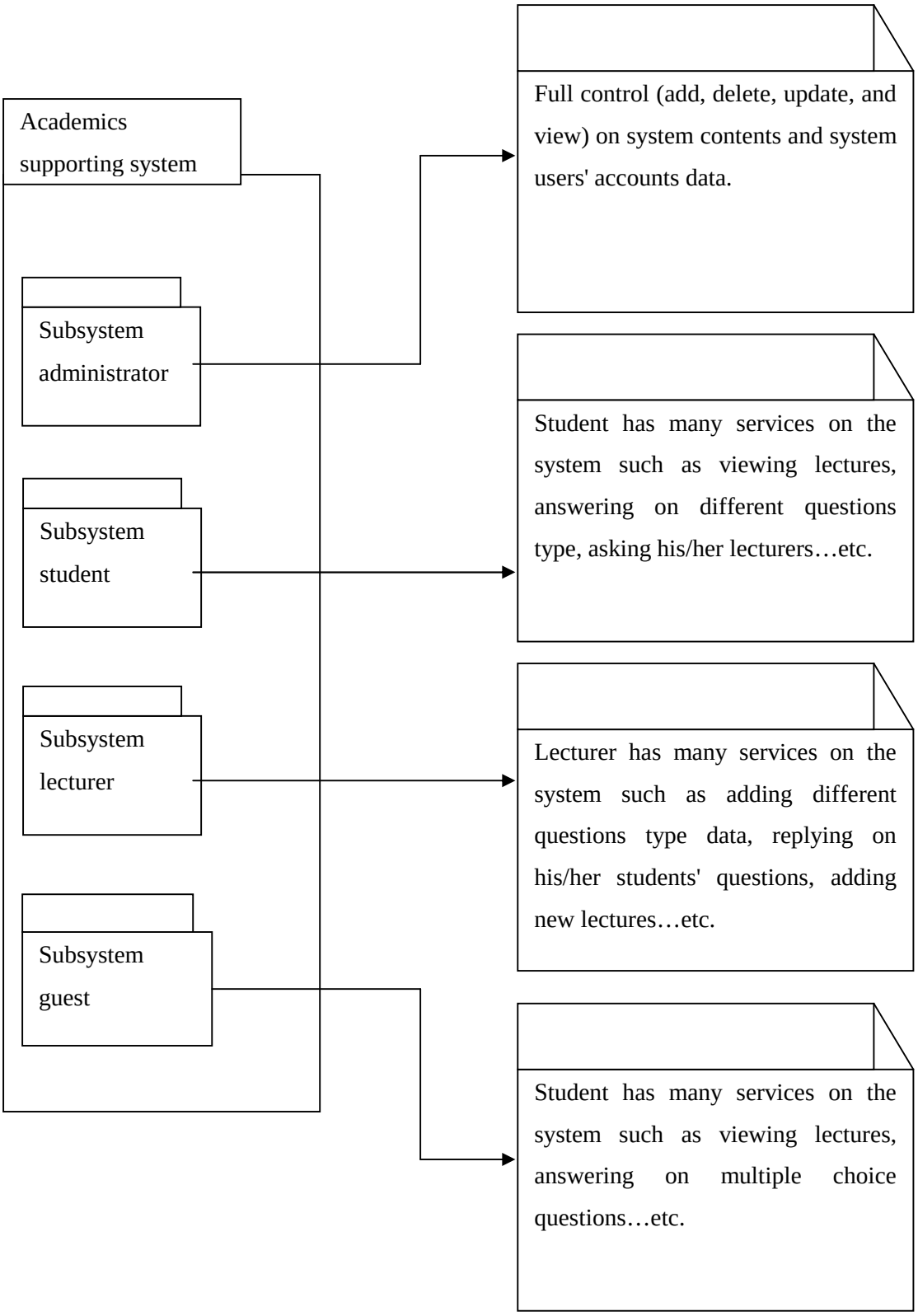


Figure 3.4 System Architecture

3.4 Function design

Here, each function of the system will be designed, for each function there are flow chart, its interface (Input/Output), constraints, and user interface I/O screen.

- **Login.**

  Each lecturer, student, or administrator can login using username and password in order to get a secure login to the system and then has the ability to use the system services

A) Interface:

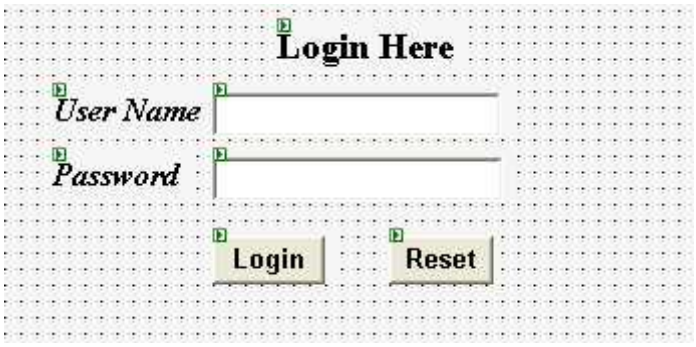
Input: user name and password.

Output: allowing the authenticated user to login on his/her page.

B) Constraints:

User name must be the user number, and the password must be between 4 to 30 characters.

C) User Interface screen:



D) Flow Chart:

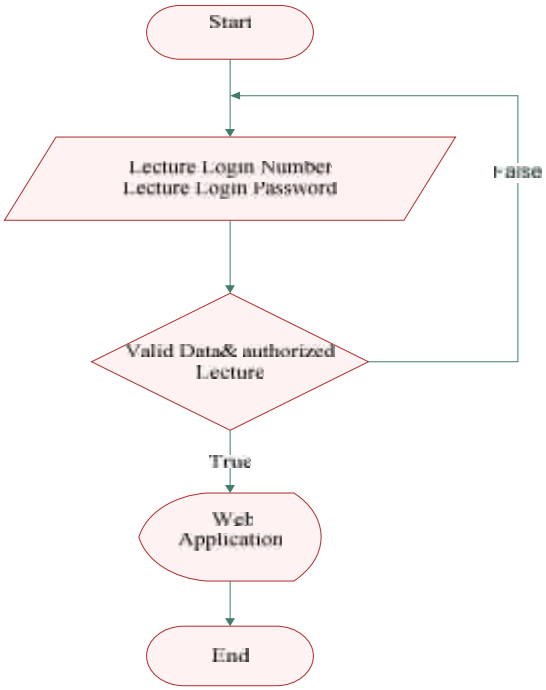


Figure 3.1: Login Flow Chart.

- **Add lectures.**

Each lecturer or administrator can login using username, password, and insert a course lectures to support students with course materials.

A) Interface:

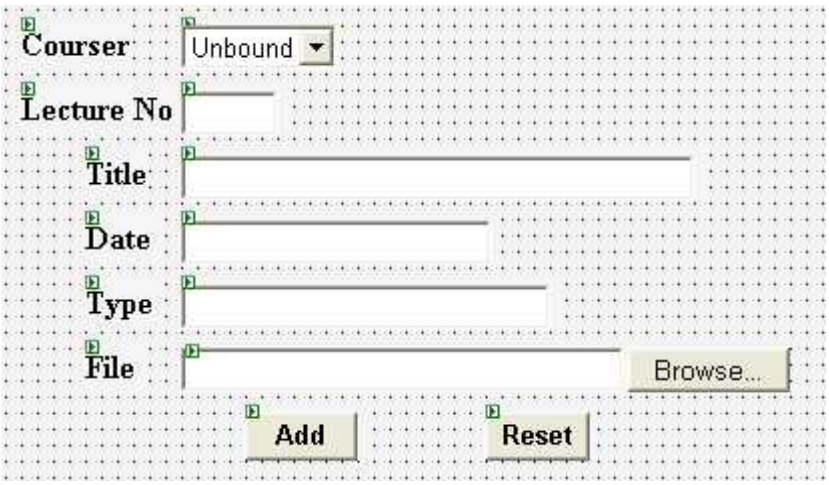
Input: course number, lecture number, lecture title, lecture type, lecture date, and the lecture file path.

Output: new lectures data and lecture material published on site

B) Constraints:

Lecture number must be numeric and integer data and also not existing.

C) User Interface screen:



D) Flow Chart

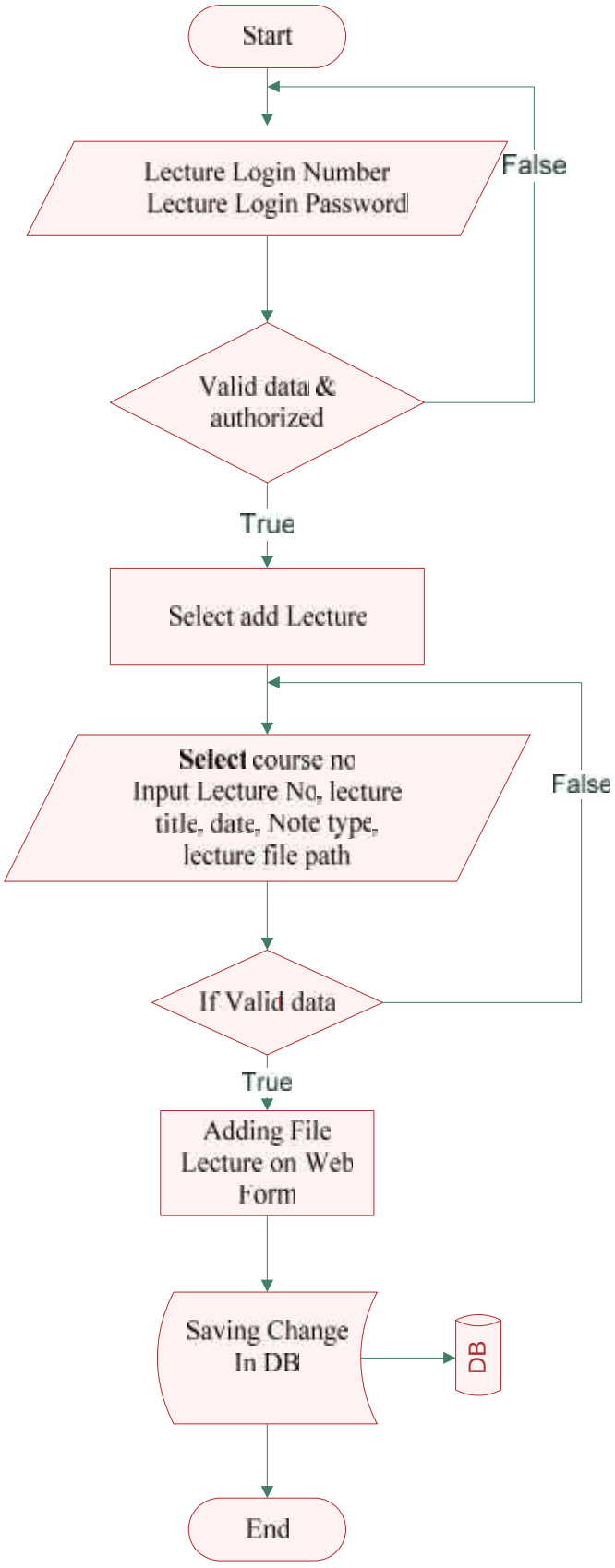


Figure 3. 2: add lectures Flow Chart.

- **Delete lectures.**

Each lecturer or administrator can login using username and password, then delete any lectures data or material from site or database since end of the time allowable to each lecture to be on line.

A) Interface:

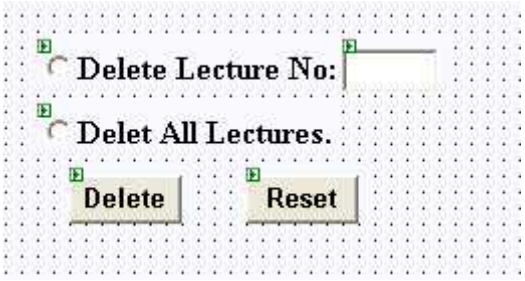
Input: course number, lecture number.

Output: delete lectures data or lecture material from the site or database.

B) Constraints:

Lecture number must be numeric and integer data and also existing.

C) User Interface screen:



D) Flow Chart

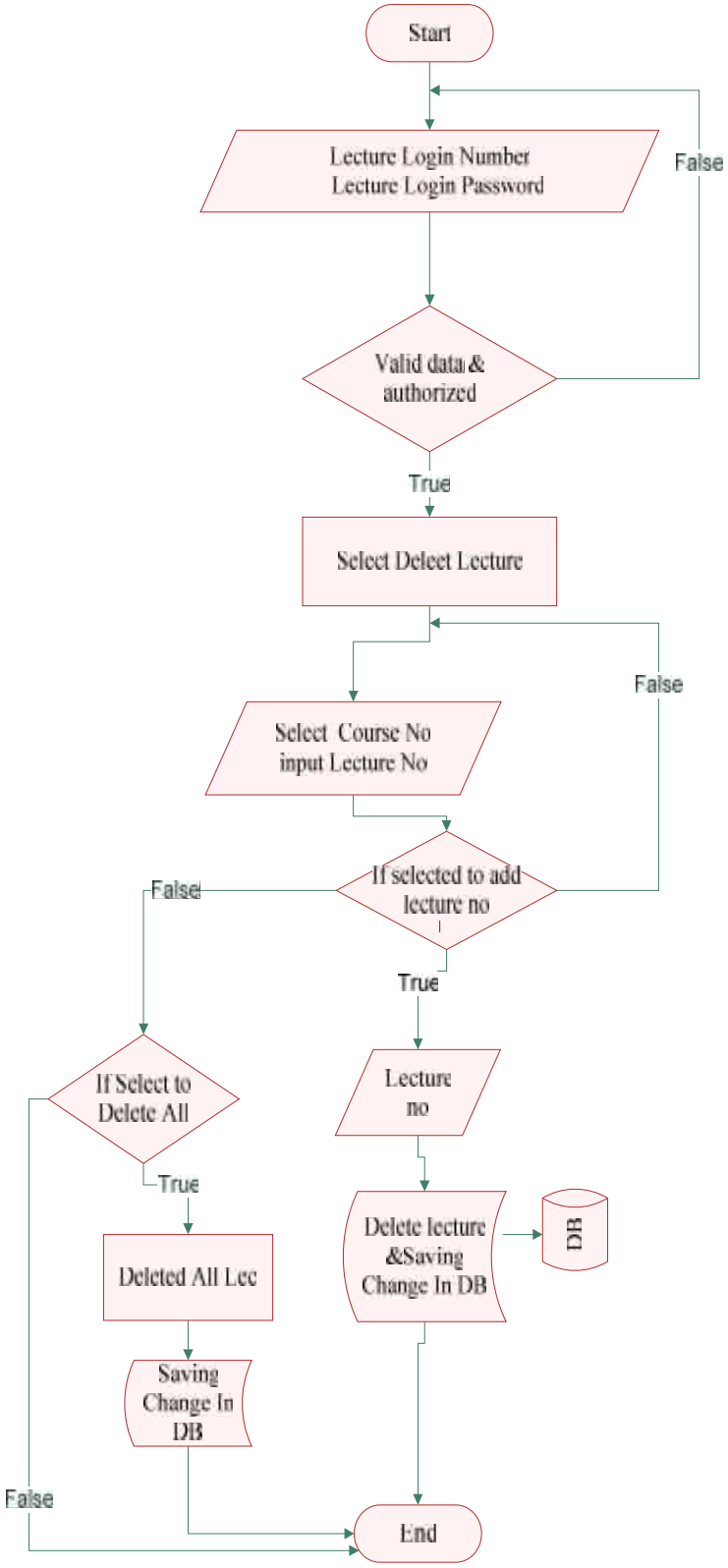


Figure 3.4: Delete Lectures Flow Chart.

- **Add multiple choice questions**

Each lecturer can login using username and password, then insert the multiple choice exam's questions data to supporting students understanding and allowing lecturer makeup his/her course exams.

A) Interface:

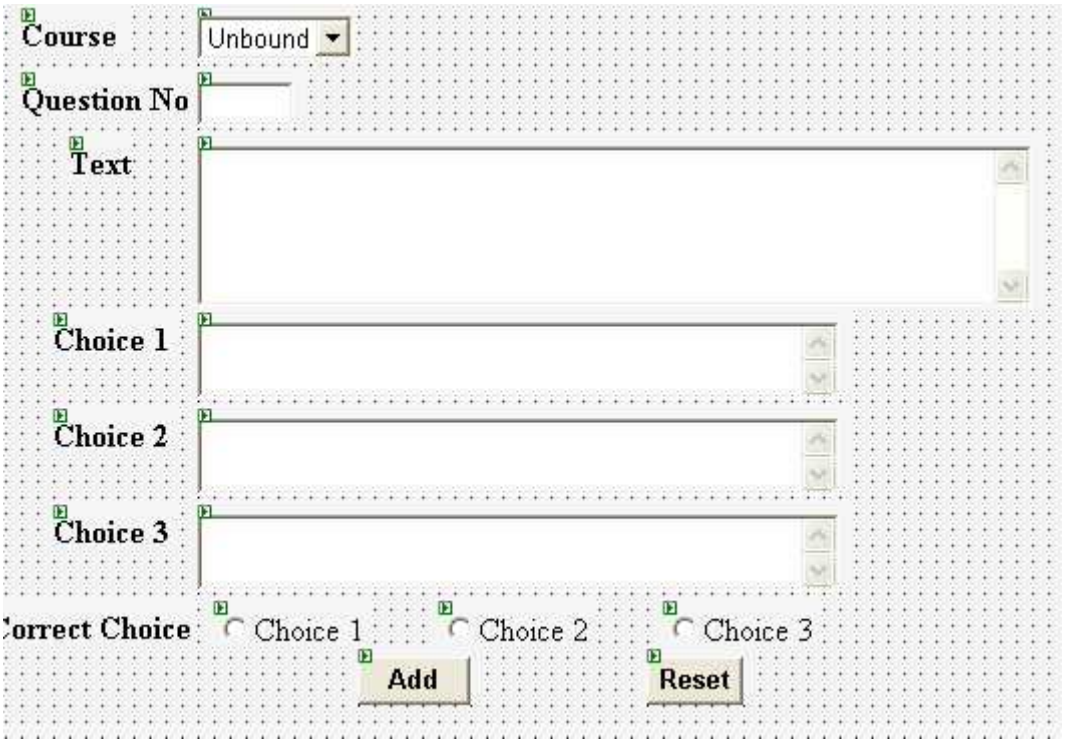
Input: course number, question number, question text, choice1, choice2, choice3 and correct choice.

Output: new multiple choice questions data in multiple choices exams table

B) Constraints:

Question number must be numeric and integer data and also not existing.

C) User Interface screen:



D) Flow Chart:

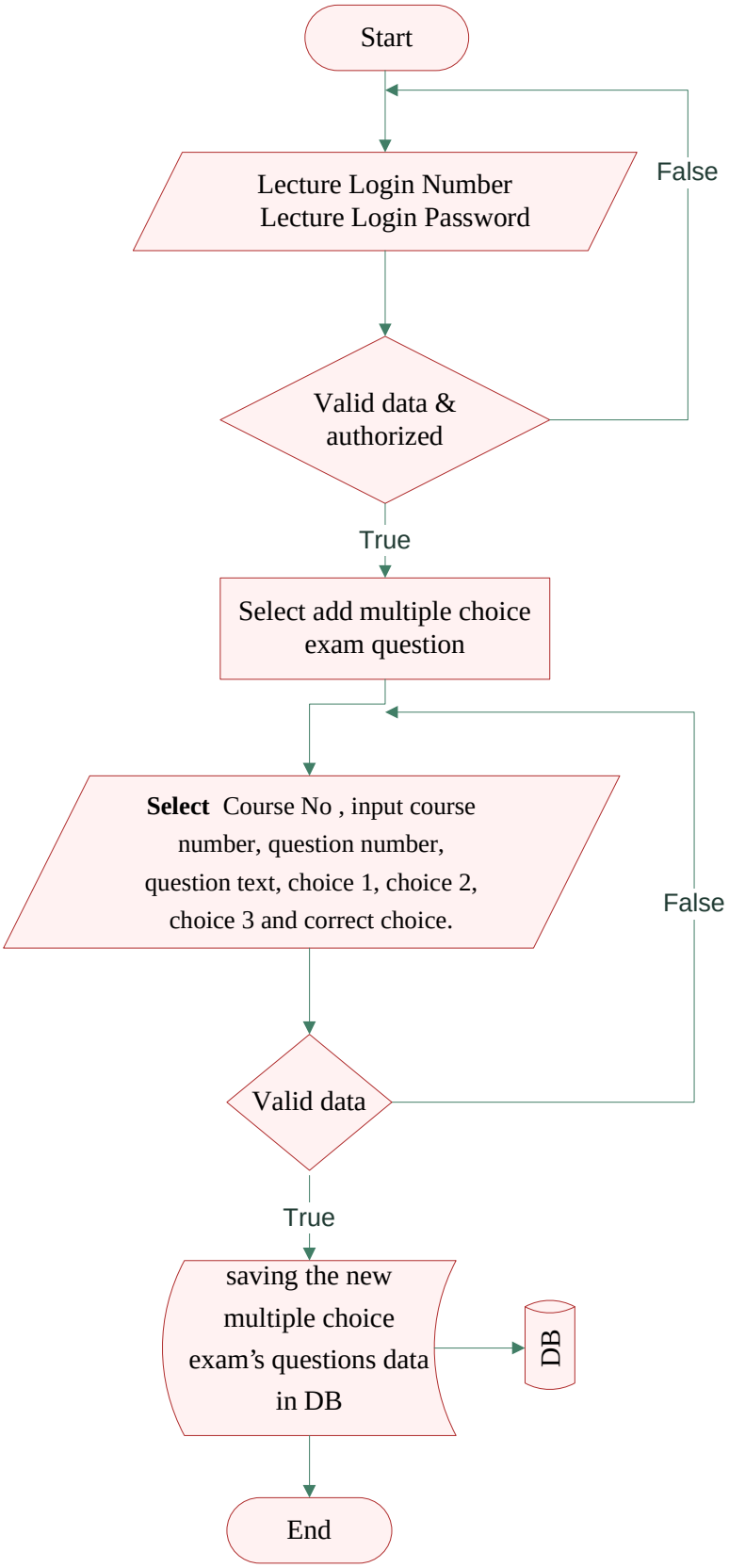


Figure 3.5: Add Choice Questions Flow Chart.

- **Add Text Questions data.**

Each lecturer can login using username and password, then insert the text exam's questions data.

A) Interface:

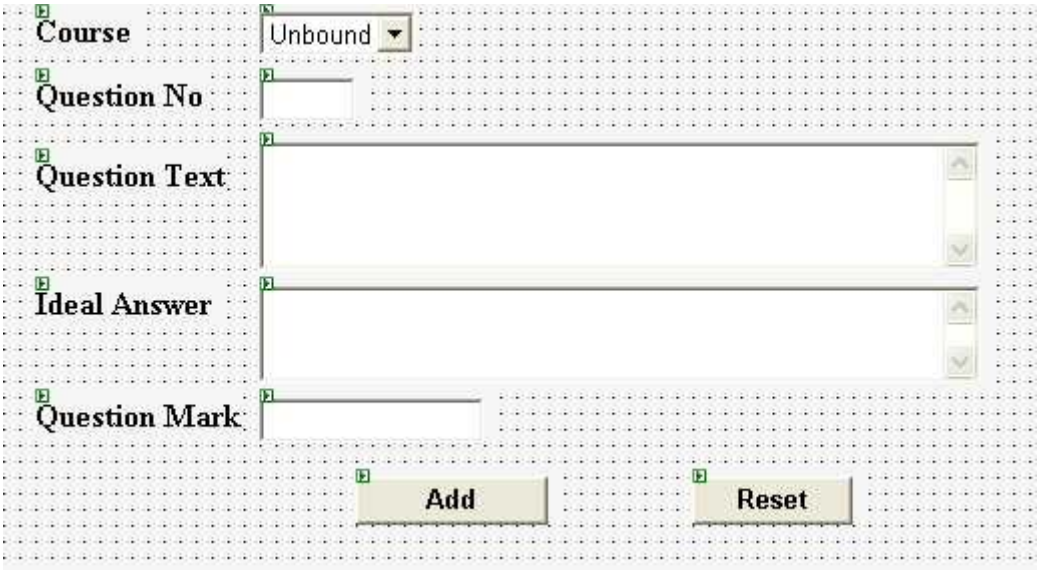
Input: course number, question number, question text, ideal answer and question mark.

Output: new text exam's questions data in Text Questions table

B) Constraints:

Question number must be numeric and integer data and also not existing.

C) User Interface screen:



D) Flow Chart:

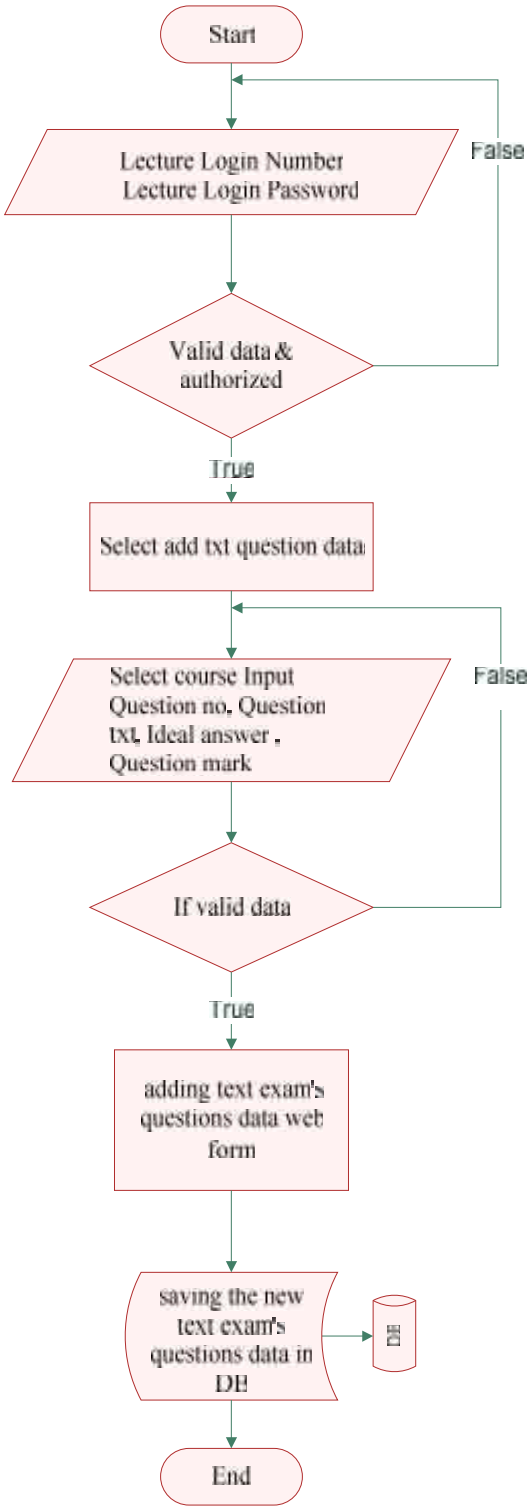


Figure 3.6: Add Text Questions Flow Chart.

- **Delete Text or Choice Questions**

Each lecturer can login using username and password, then delete any text or choice questions data to supporting add other questions to makeup other exams.

A) Interface:

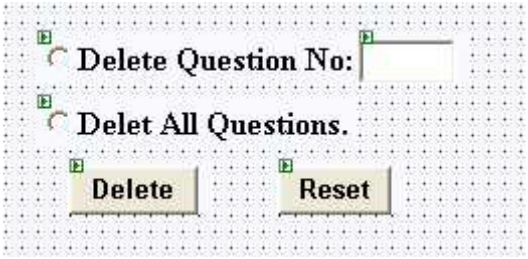
Input: course number, question number.

Output: delete text exam's questions data from Text Questions exams table

B) Constraints:

Question number must be numeric and integer data and also existing.

C) User Interface screen:



D) Flow Chart:

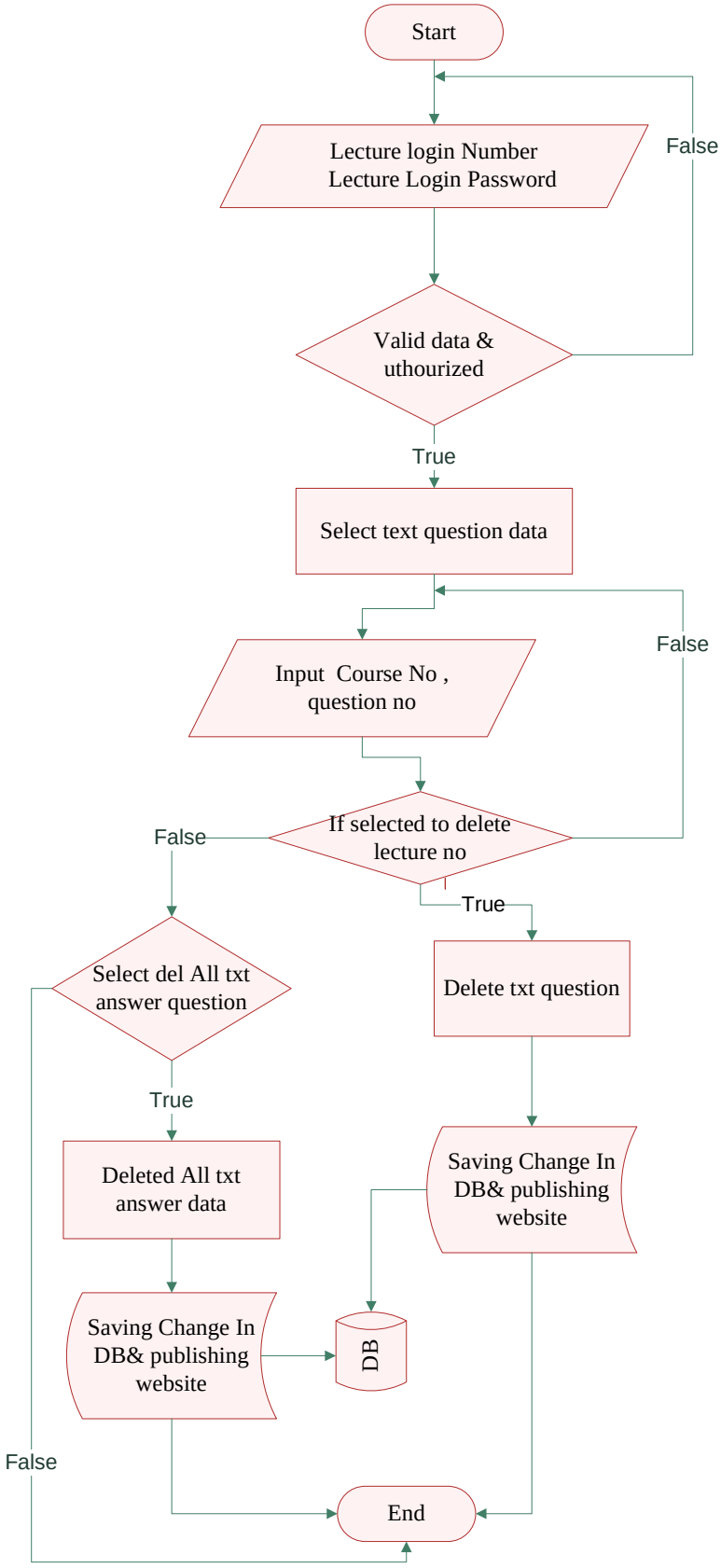


Figure 3.7: Delete Text Question Flow Chart.

- **Delete advertisements.**

  Each lecturer or administrator can login using username and password, then delete any advertisement because end of advertisements allowable time to be on line.

A) Interface:

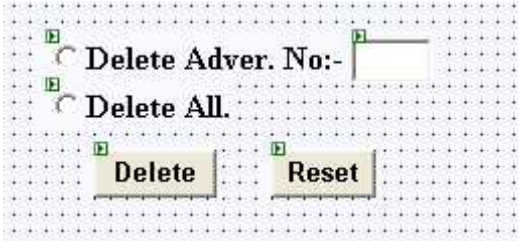
Input: course number, advertisement number.

Output: Delete advertisement data.

B) Constraints:

Advertisement number must be numeric and integer data, and also existing.

C) User Interface screen:



D) Flow Chart

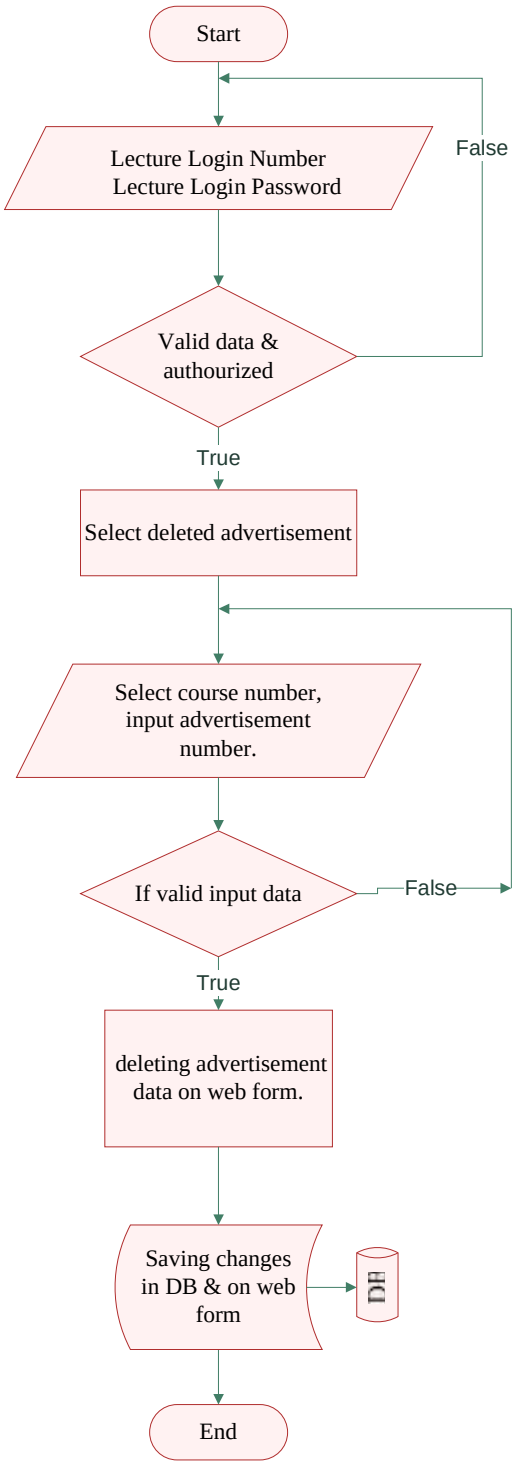


Figure 3.8: Delete advertisements Flow Chart.

- **View Text or Choice Questions.**

  Any user can view a multiple choice questions data, but the login users can view also the text questions data.

A) Interface:

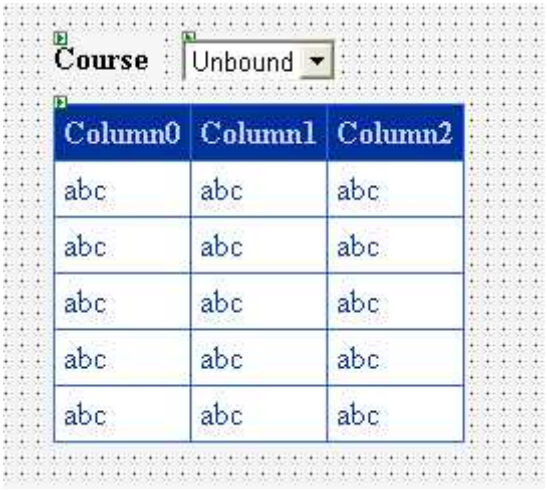
Input: course number.

Output: display questions data on the web form.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart

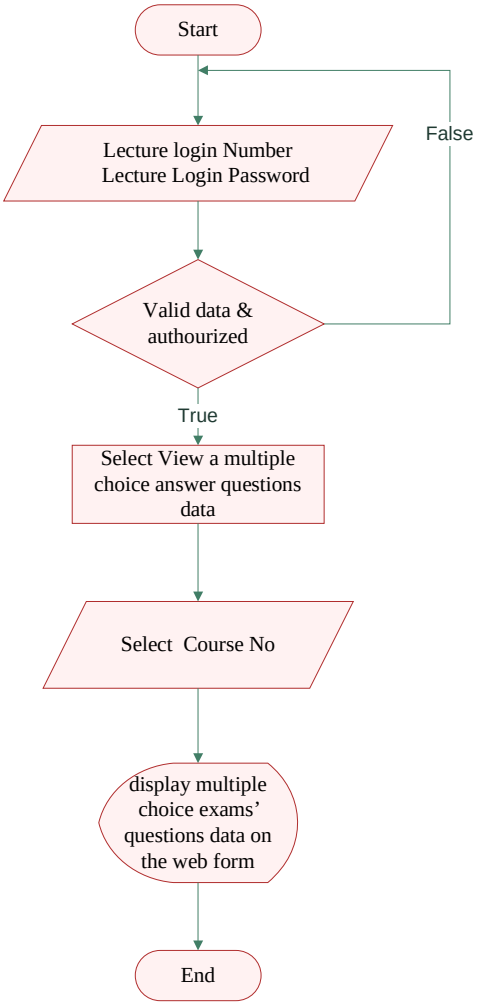


Figure 3.11: View MCAQ data Flow Chart.

- **Update Text and Choice Questions.**

Each lecturer can login using username and password, then update the text or choice questions data, so that enable to refresh and making any adjustments to the questions data.

A) Interface:

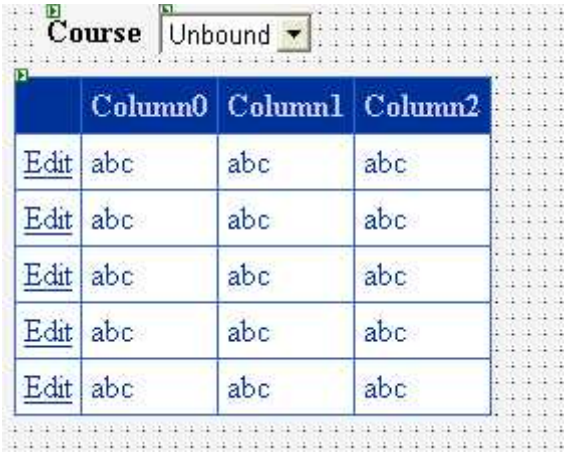
Input: new question text, new ideal answer, and new question mark.

Output: new text exam's questions data in Text Questions exams table.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart

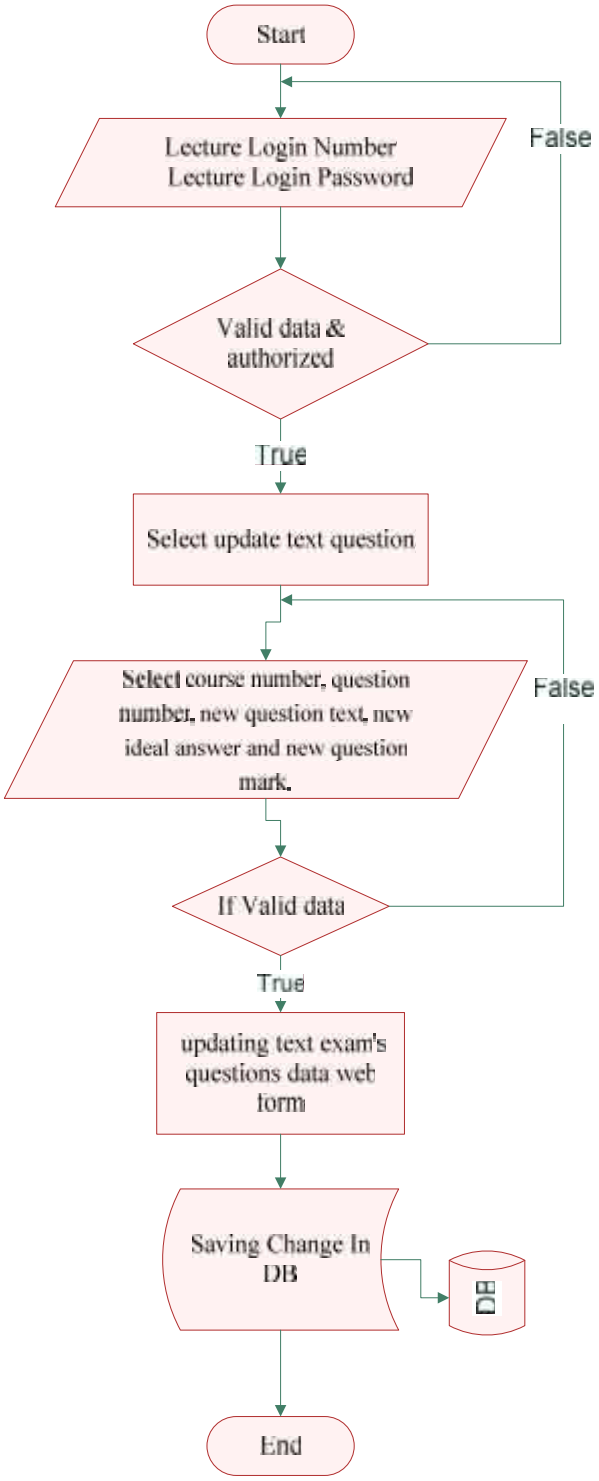


Figure 3.12: Update Text Questions data Flow Chart.

- **Add advertisements.**

  Each lecturer or administrator can login using username and password, then Add advertisements for his/her courses since keep his/her students awareness and announced of courses news or any others related news.

A) Interface:

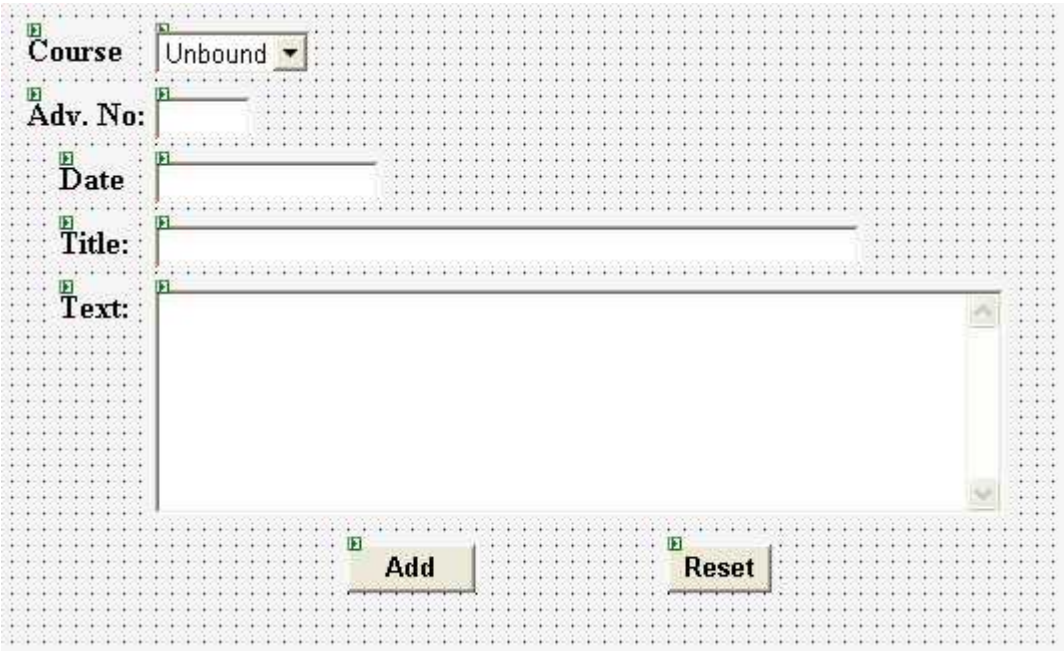
Input: course number, advertisement number, advertisement date, advertisement title, and advertisement text.

Output: new advertisement.

B) Constraints:

Advertisement number must be numeric, integer and not existing.

C) User Interface screen:



D) Flow Chart

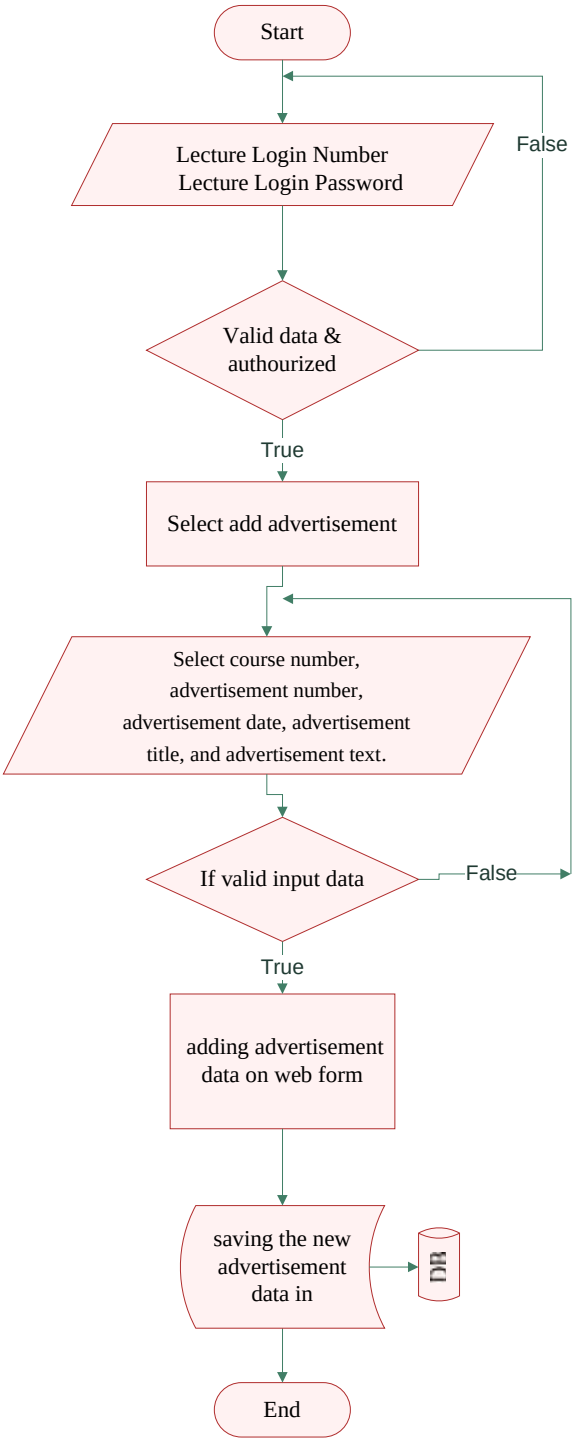


Figure 3.14: Add Advertisements Flow Chart.

- **View advertisements.**

Each lecturer, student, or administrator can login using username and password, then viewing the available advertisements data.

A) Interface:

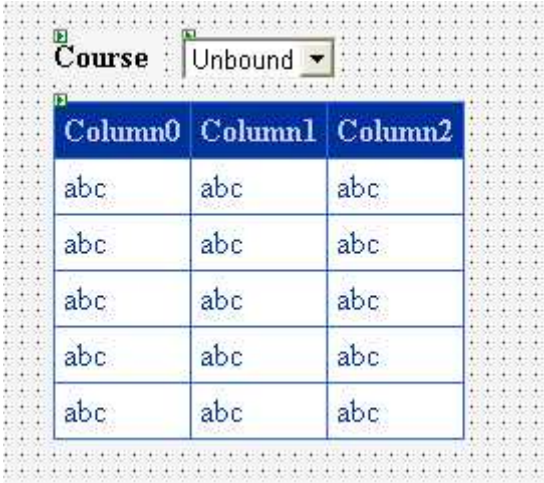
Input: course number.

Output: Display advertisement data on the table (Data Grid).

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart

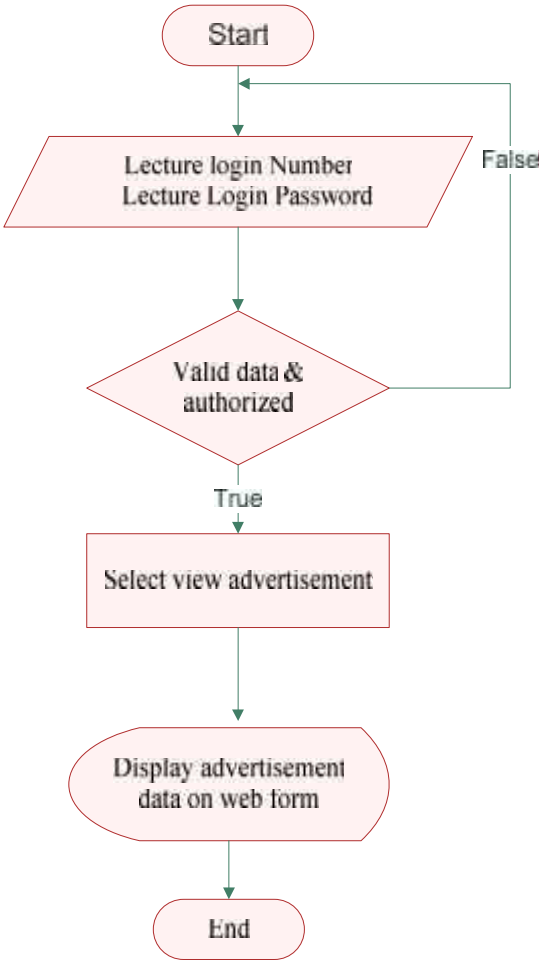


Figure 3.16: View Advertisements Flow Chart.

- **Reply on Students and Generalizes the Reply.**

  Each lecturer can login using username and password, then Send replies for the received questions or notes from his/her students or generalize that reply to all students, so that enabling to contact with his/her students, and solve any ambiguous for any students.

A) Interface:

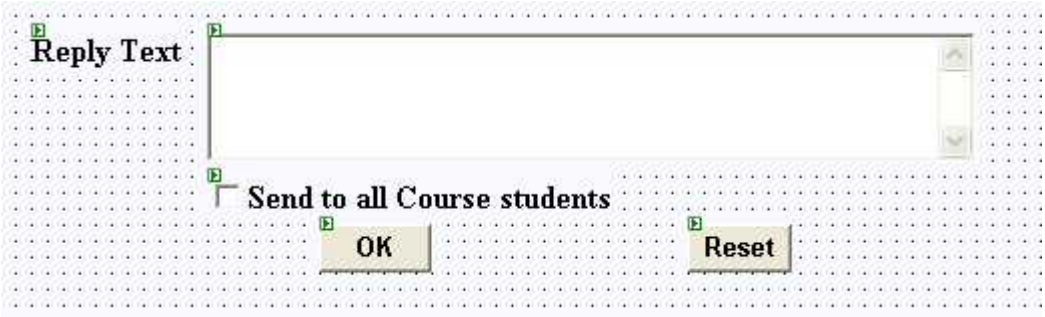
Input: course number, question number, student number, and reply text

Output: new reply.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart

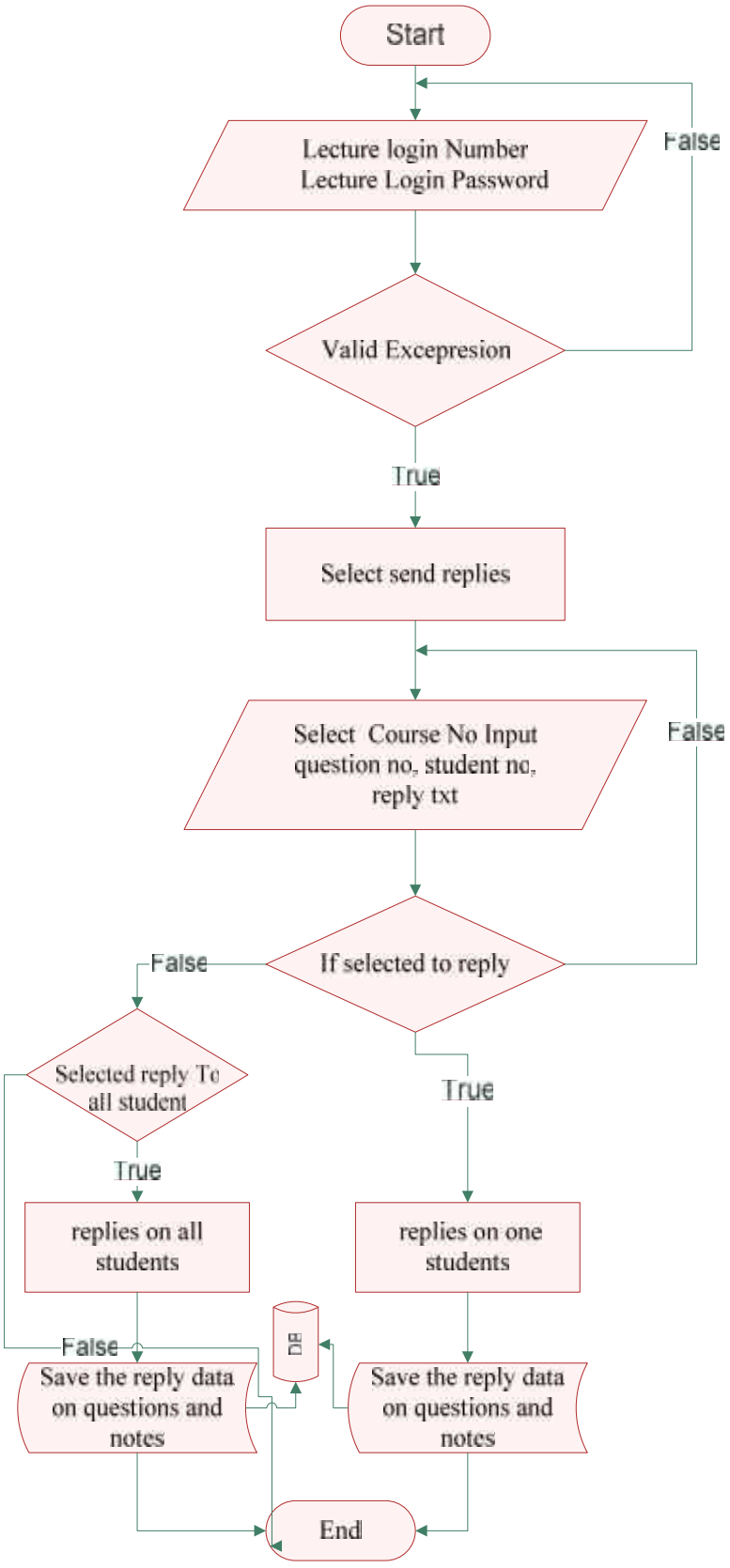


Figure3.17: Replying on Students Flow Chart.

- **Change password.**

  Each lecturer or administrator can login using username and password, then change his/her password to increase the security of his/her page login. But the administrator has also the privilege to change any user's passwords

A) Interface:

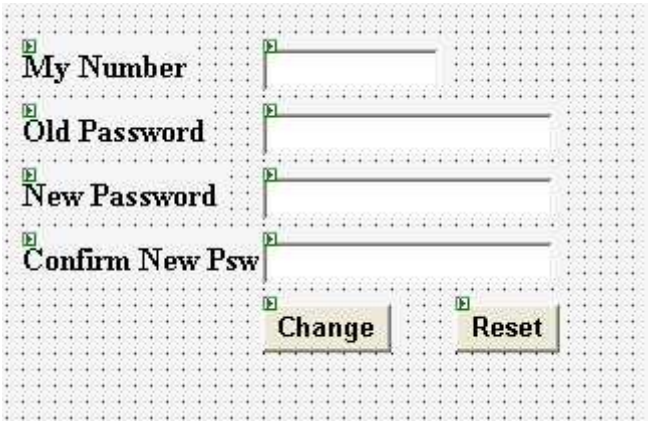
Input: student number, old password, new password, and confirm new password.

Output: new password.

B) Constraints:

The user number must be exist and valid data type.

C) User Interface:



D) Flow Chart:

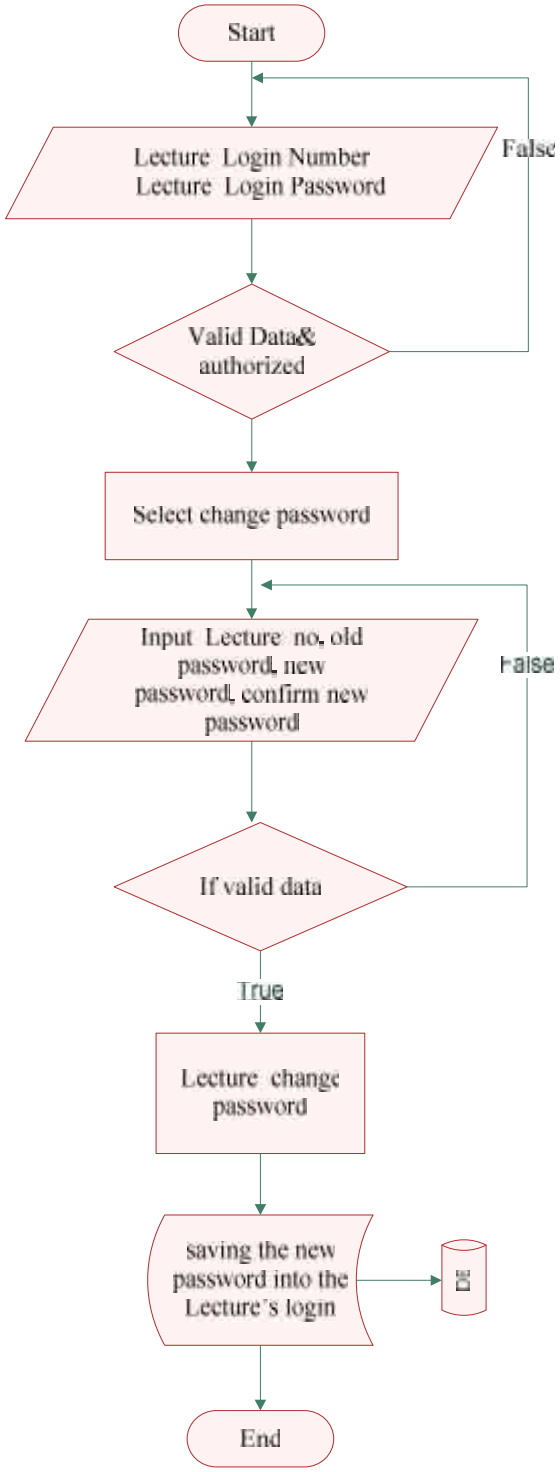


Figure 3.20: Change Password Flow Chart.

- **Evaluate Students Answers.**

  Each lecturer can login using username and password, then Evaluate students' answers on the required text answer questions.

  A) Interface:

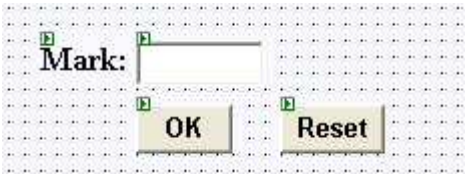
  Input: course number, question number, student number, and student mark.

  Output: Student's evaluated answer.

  B) Constraints:

  No constrains.

  C) User Interface:



D) Flow Chart:

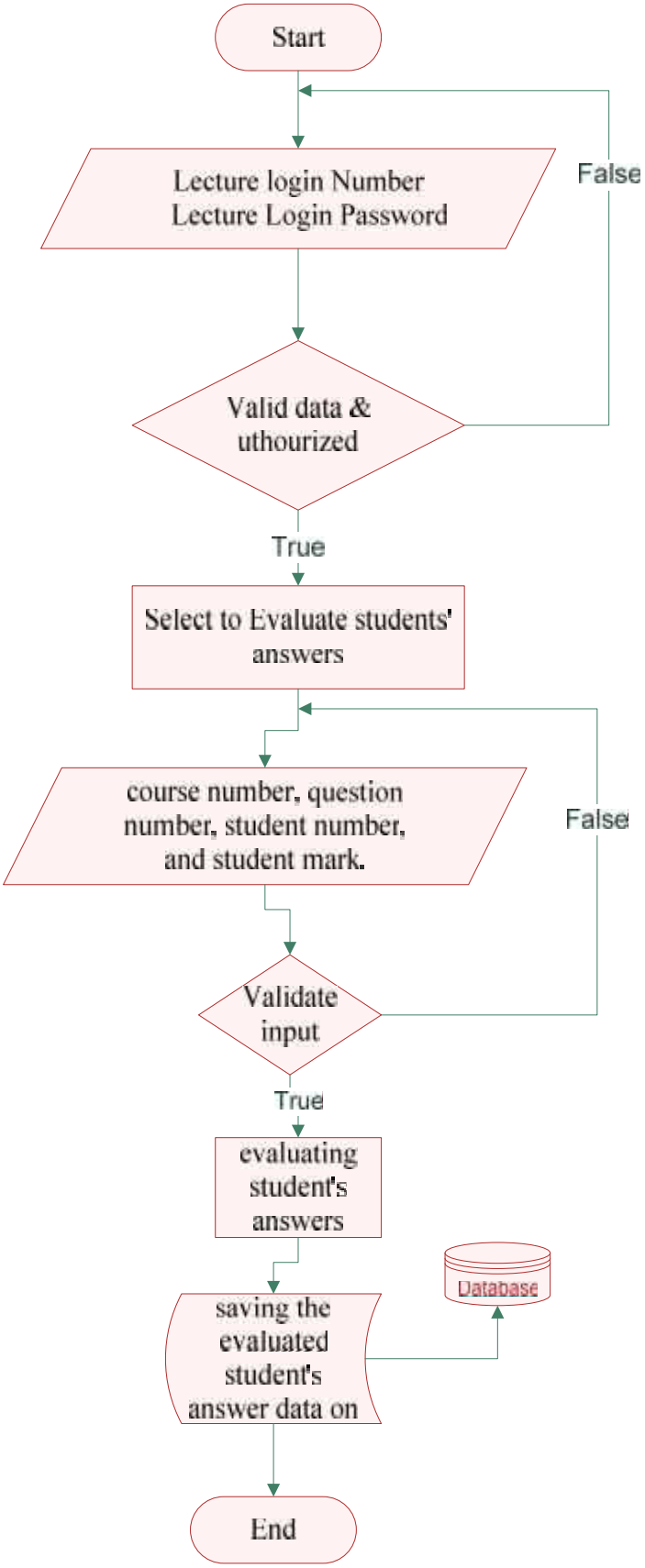


Figure 3.2: evaluate Student Answer Flow Chart.

- **Getting help.**

Any user can getting help about the site and how to using it according to his/her privileges.

A) Interface:

Input: select to view help.

Output: helping materials to de viewed.

B) Constraints:

No constrains.

C) User Interface:

Select the labeled "**Help!**" hyper link that located in each page.

D) Flow Chart:

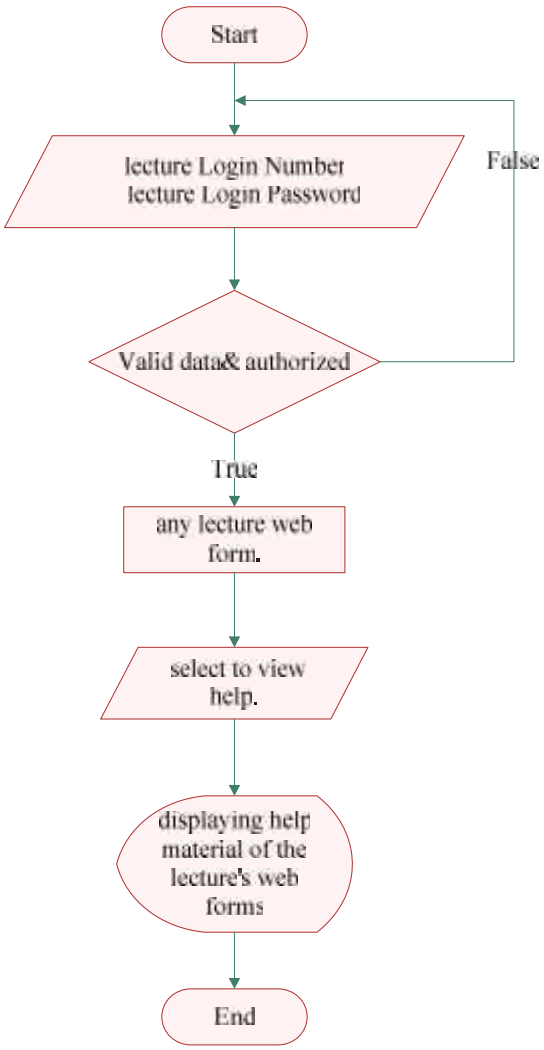


Figure 3.22: Getting help Flow Chart.

- **View the available online lectures.**

Each student can login using username and password, then View the available on line (video, text, or audio) lectures for any course in the university for the Self learning of different lectures materials including his/her lectures.

A) Interface:

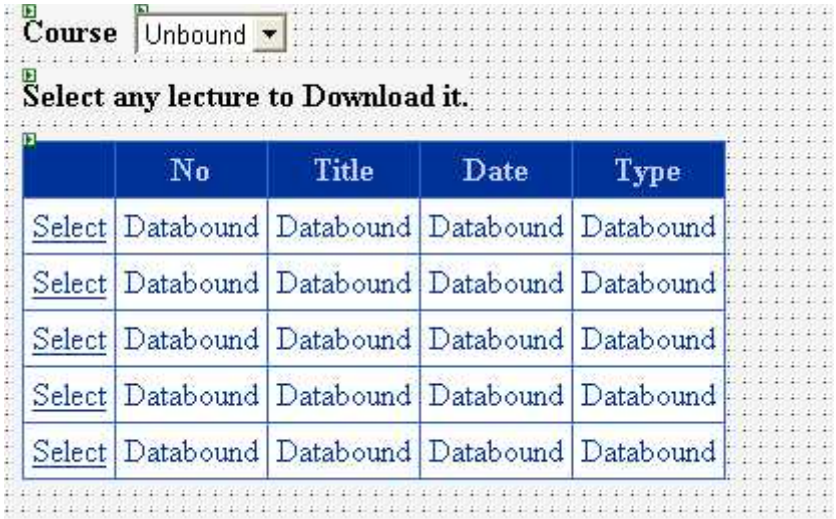
Input: college number, department number, major number, and course number.

Output: Courses' lectures materials available to be displayed..

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

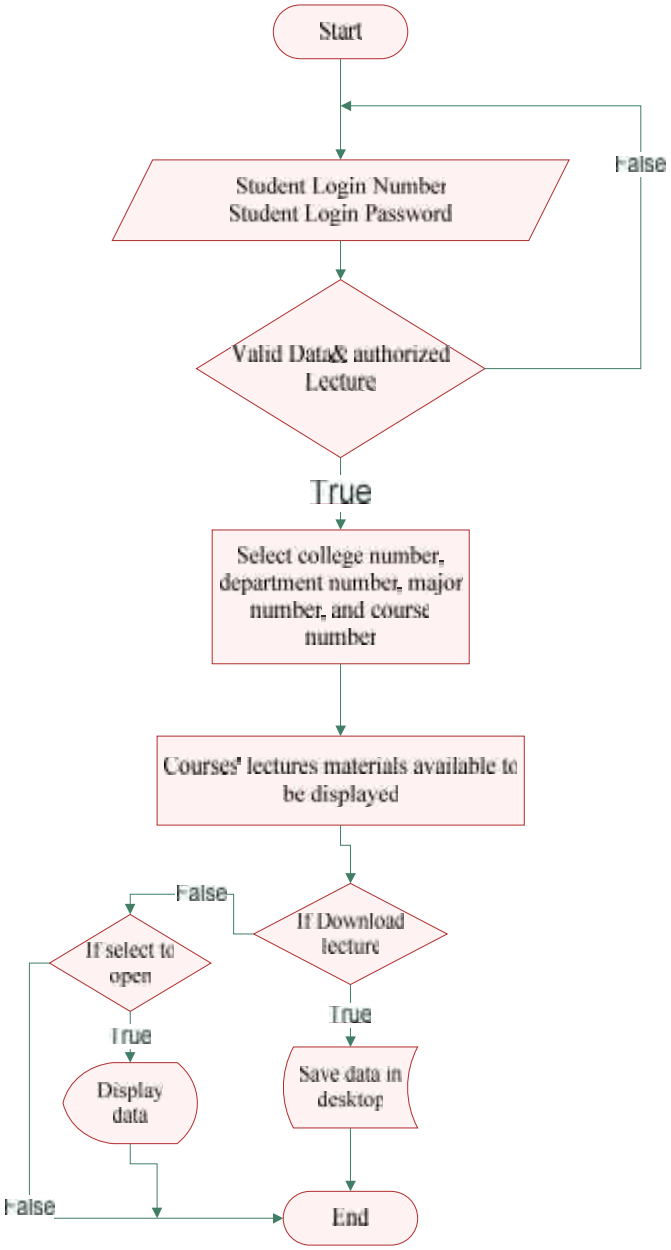


Figure 3.24 View Lectures Flow Chart.

- **Answering on Text Questions.**

Each student can login using username and password, then answering on the required text answers questions that available on his/her courses. Since the Self learning and evaluating, Increase his/her understanding, and increasing his/her knowledge.

A) Interface:

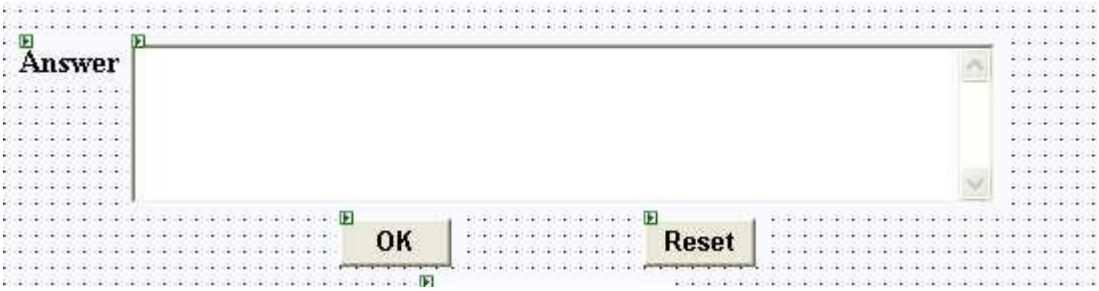
Input: course number, question number, and answer text.

Output: answers on text questions.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

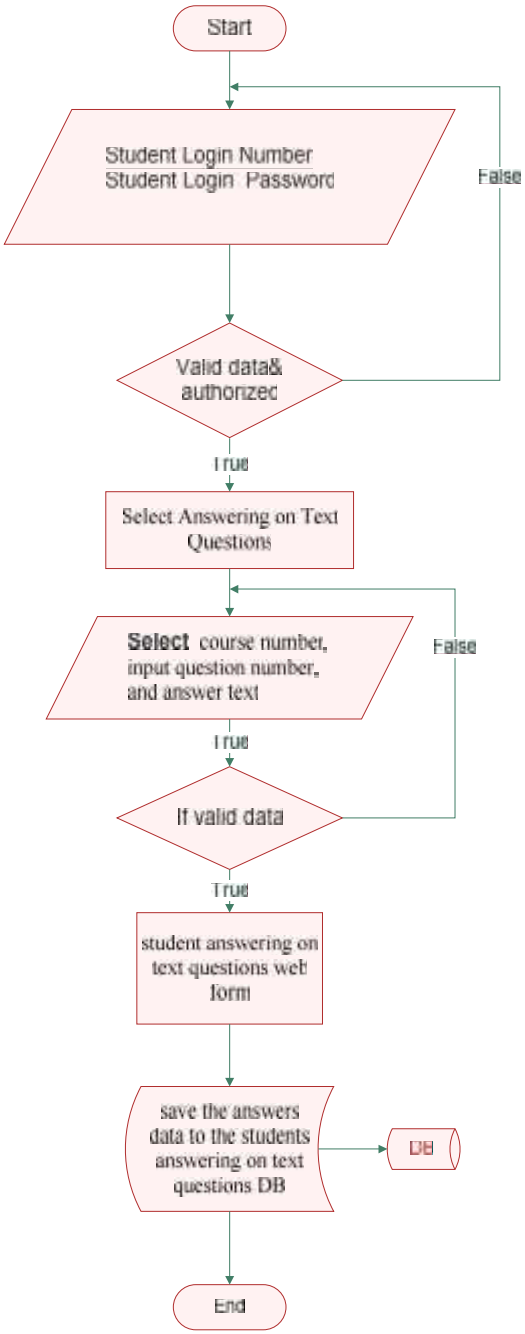


Figure 3.26: Answering on Text Questions Flow Chart.

- **Send notes on site to the site administration**

Each student can login using username and password, then send notes, opinions, or suggestions about this site to the site administration .this can be Express his/her own opinions and enabling the site administration evaluating the site.

A) Interface:

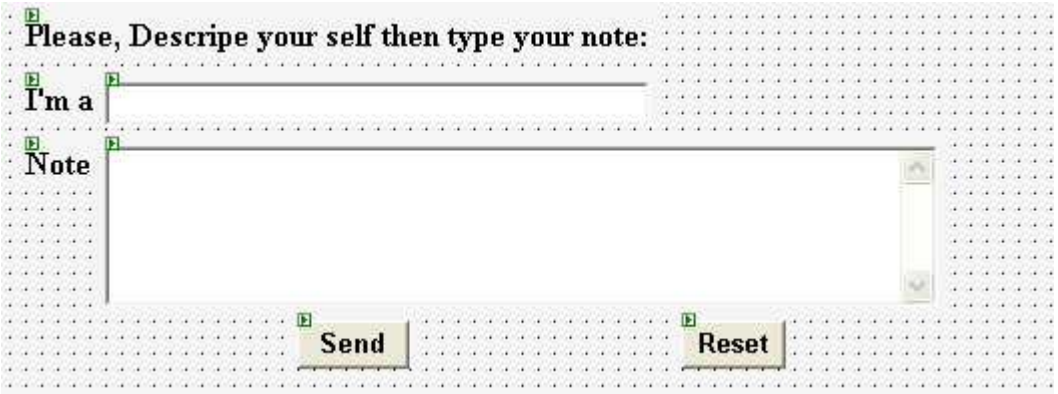
Input: brief description of his/her self and his/her note text.

Output: notes on the site.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

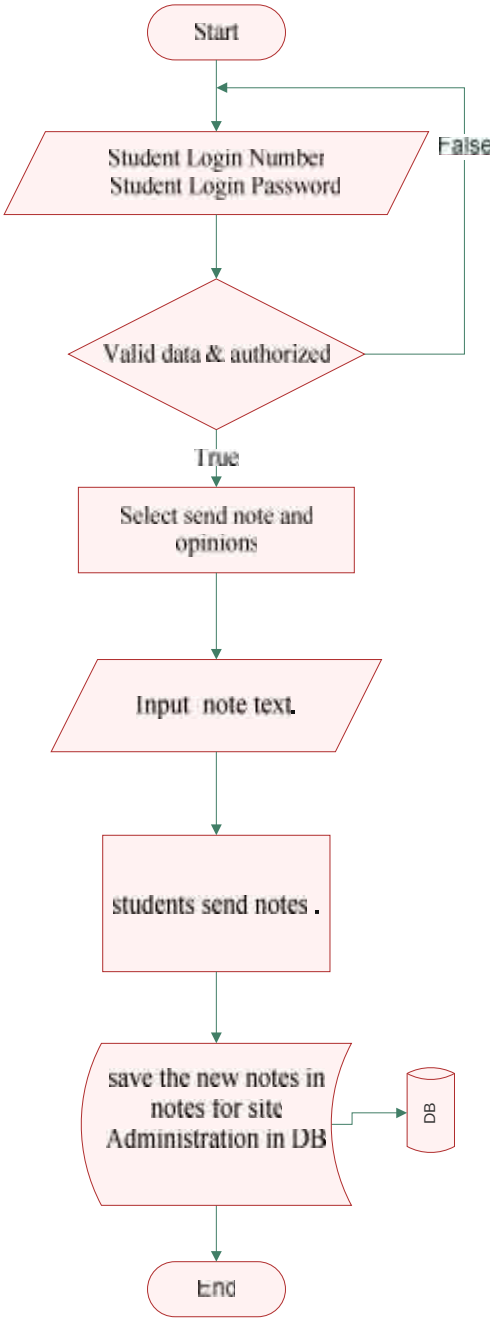


Figure 3.27: Send notes on the site Flow Chart.

- **Ask Lecturers.**

  Each student can login using username and password, then send notes or questions to his/her lecturers.

A) Interface:

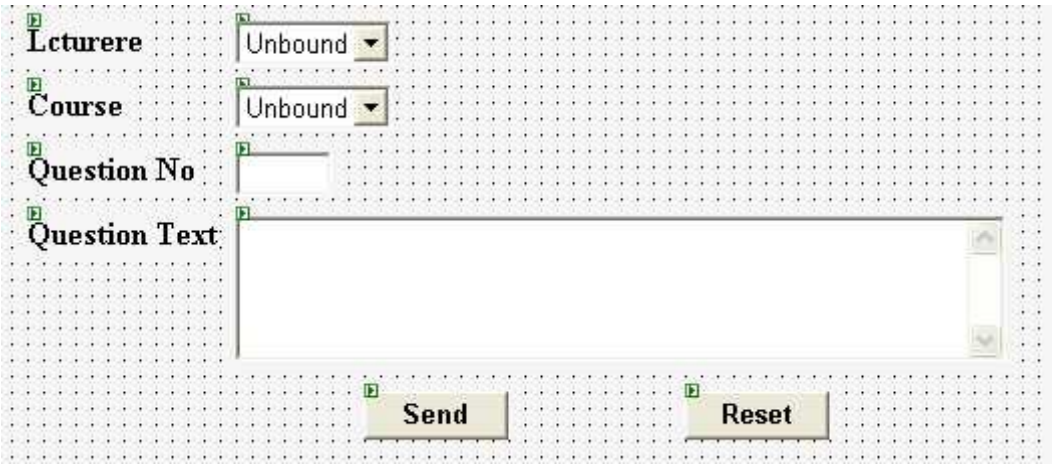
Input: lecturer number, course number, question number, and question or note text.

Output: question or note sends to the lecturer.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

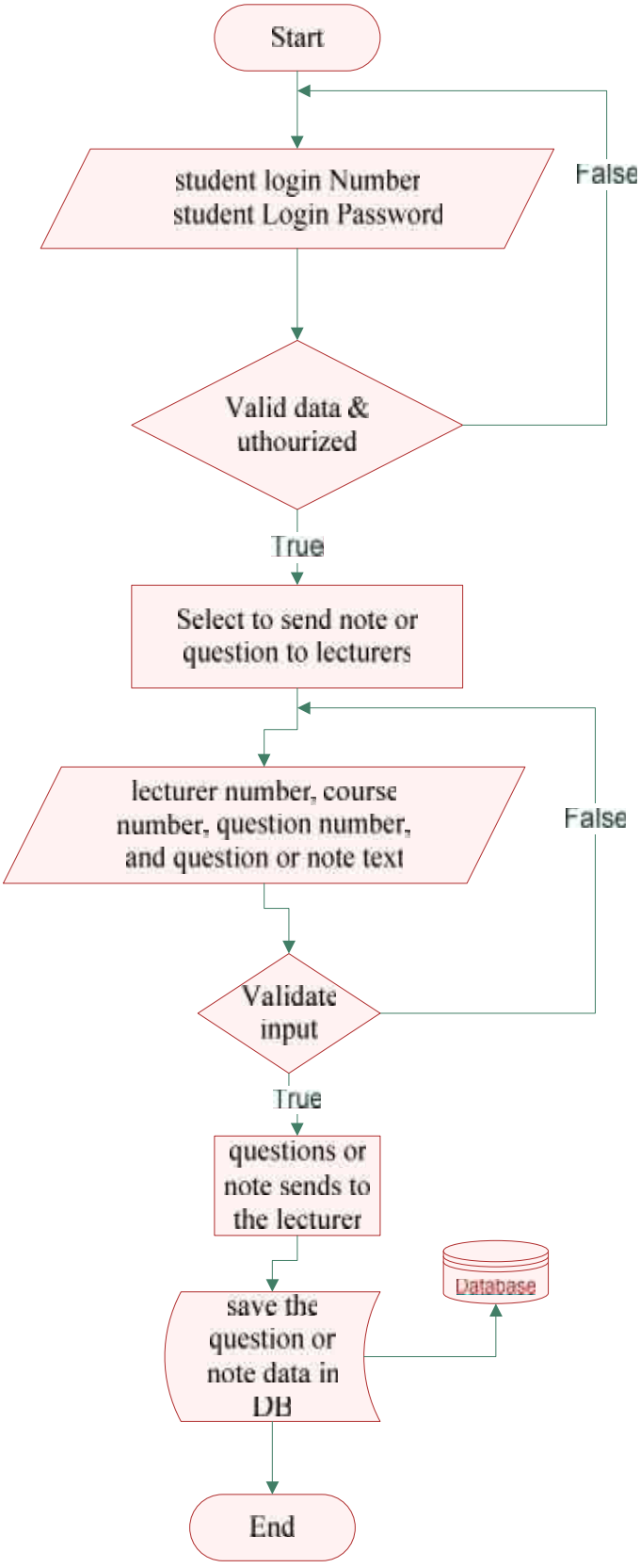


Figure 3.28: Ask lecturer Flow Chart.

- **View the incoming Lecturers' Replies.**

  Each student can login using username and password, then view the incoming replies from his/her lecturer.

A) Interface:

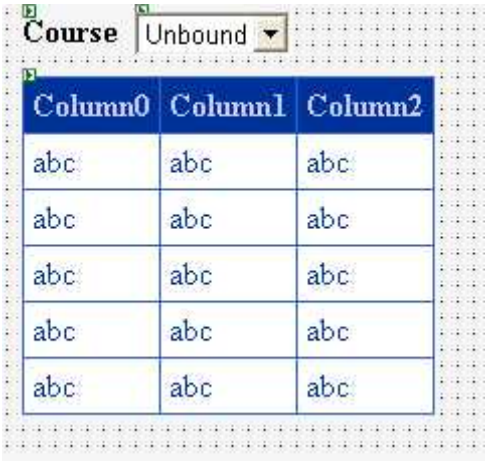
Input: course number.

Output: replies' data to be displayed.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

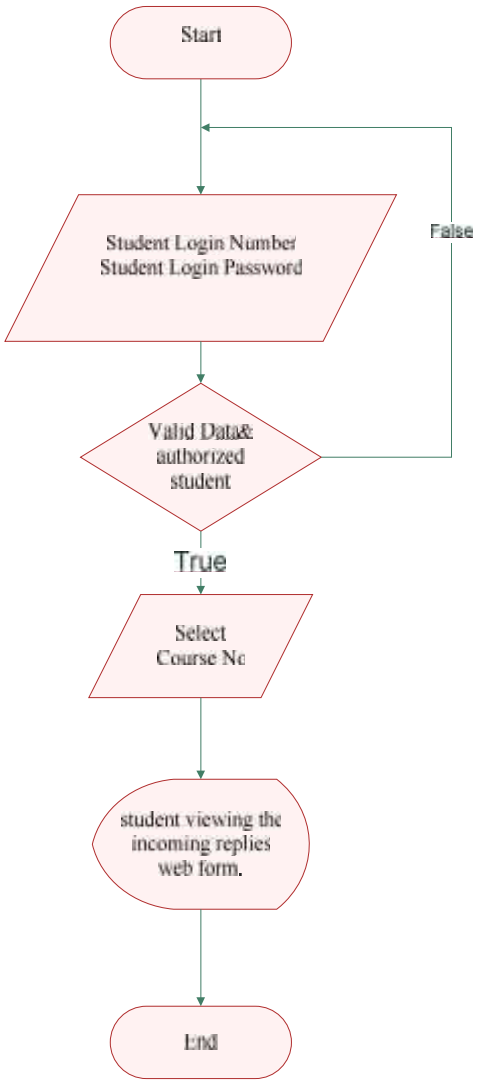


Figure 3.29 View Lecturers' Replies Flow Chart.

View the Answers Result.

Each student can login using username and password, then view the result of his/her answering on text questions.

A) Interface:

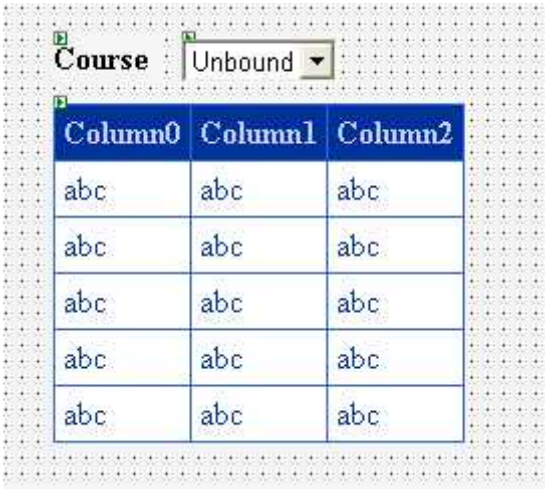
Input: course number.

Output: result data to be displayed on a table (Data Grid)

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

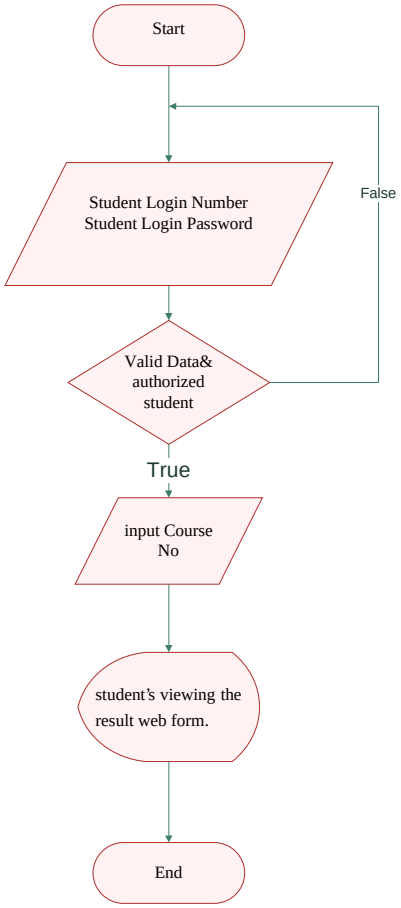


Figure 3.31: View Result Flow Chart.

- **Answering on multiple choice questions.**

  Any user can answer on a collection of multiple choice questions and can view his/her result.

A) Interface:

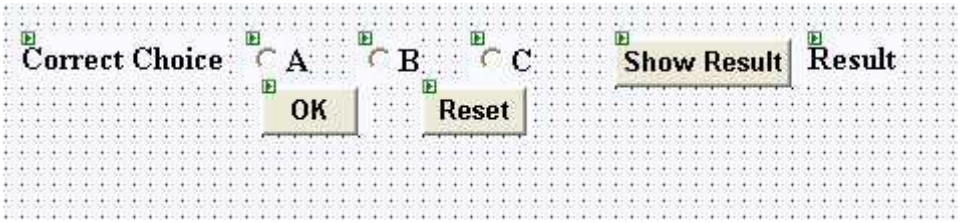
Input: course number, question number, and the correct choice.

Output: answers on multiple choice questions.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

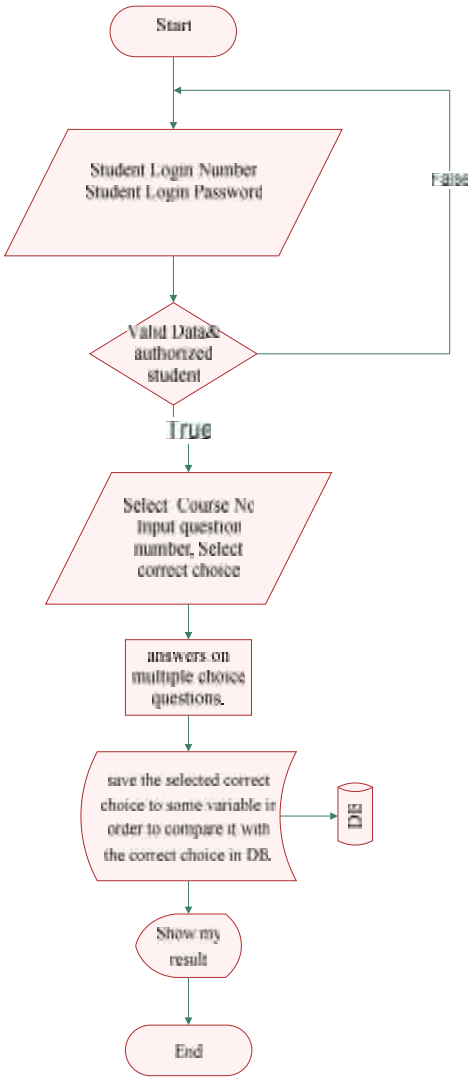


Figure 3.35: Answering on Multiple Choice Questions Flow Chart.

- **Add New Users Accounts.**

  Each Administrator can login using username and password then can add new users' accounts, these users are students, lecturers, or administrators.

A) Interface:

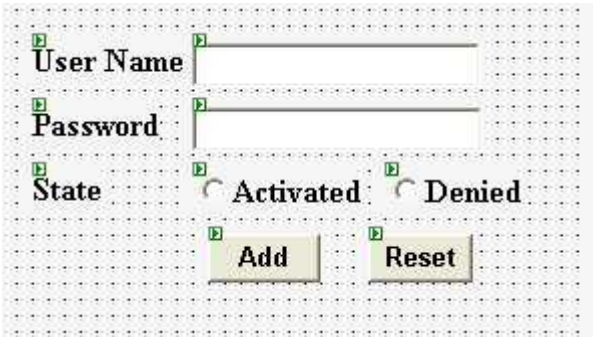
Input: user name, password and its state (activated or denied).

Output: new user accounts.

B) Constraints:

The new user must be registered to the university, not existing; the password must be between 4 to 30 characters.

C) User Interface screen:



D) Flow Chart:

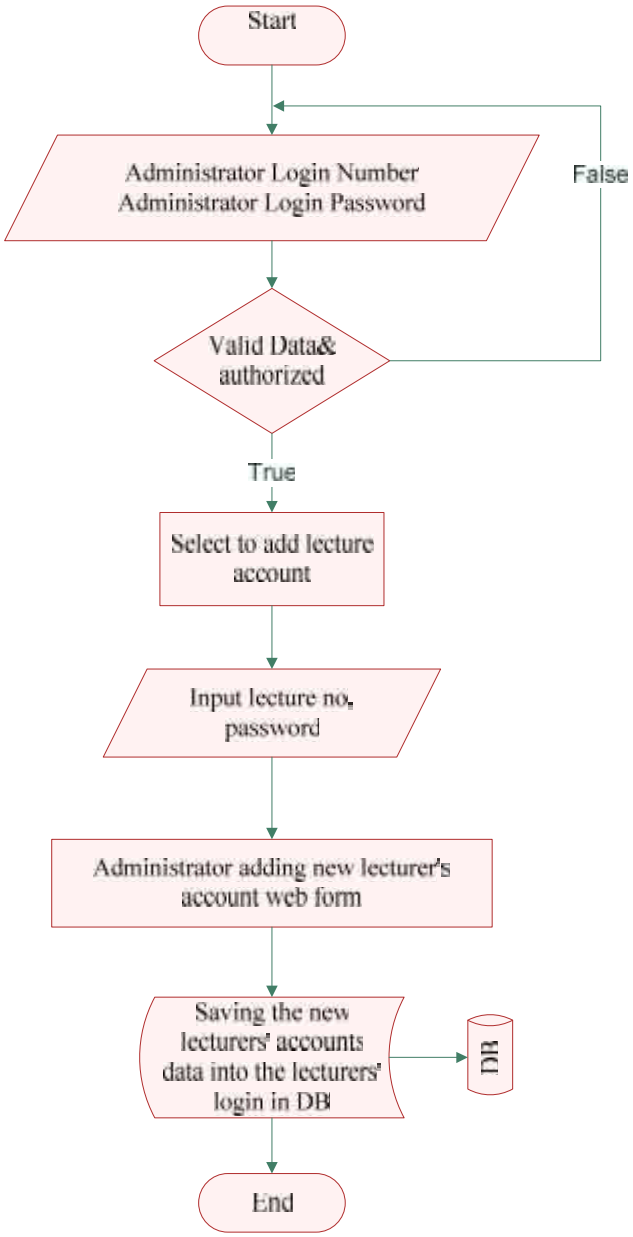


Figure 3.40: Add New User Accounts Flow Chart.

- **Delete Accounts.**

  Each Administrator can login using username and password then can delete any user accounts on the system.

A) Interface:

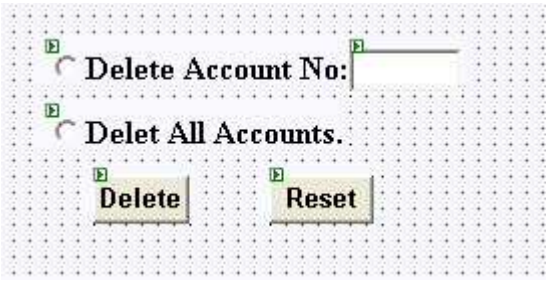
Input: account number.

Output: deleting lecturer's account.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

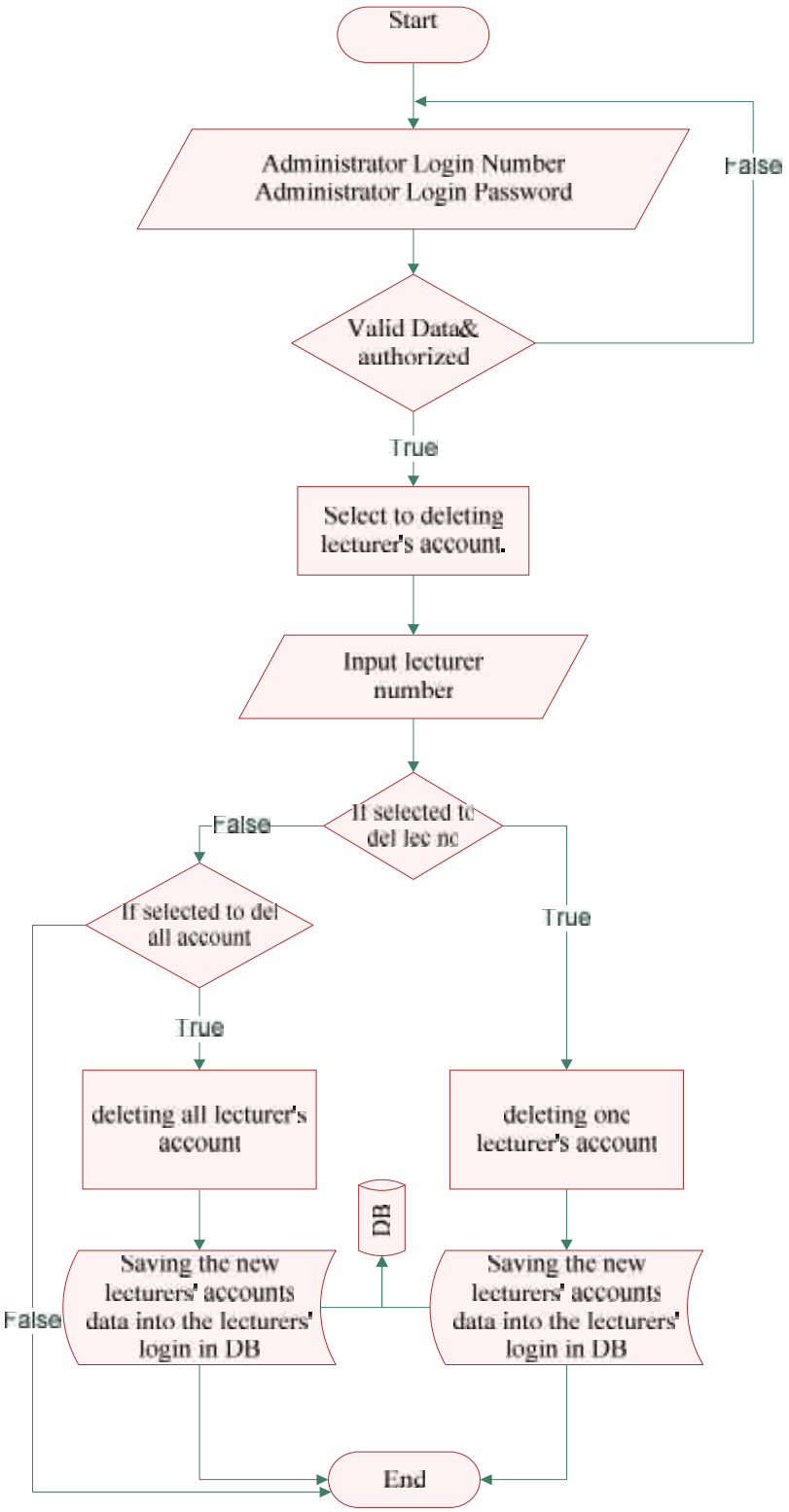


Figure 3.41: Delete Accounts Flow Chart.

- **View Users Accounts.**

  Each Administrator can login using username and password then can view the lecturers' accounts on the system.

A) Interface:

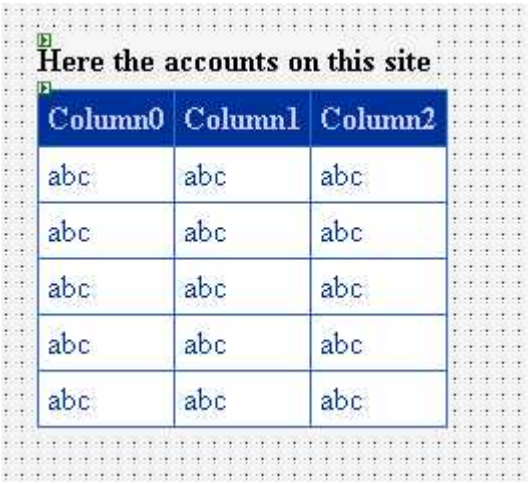
Input: decides and selects to view users' accounts.

Output: users' accounts data to be displayed.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

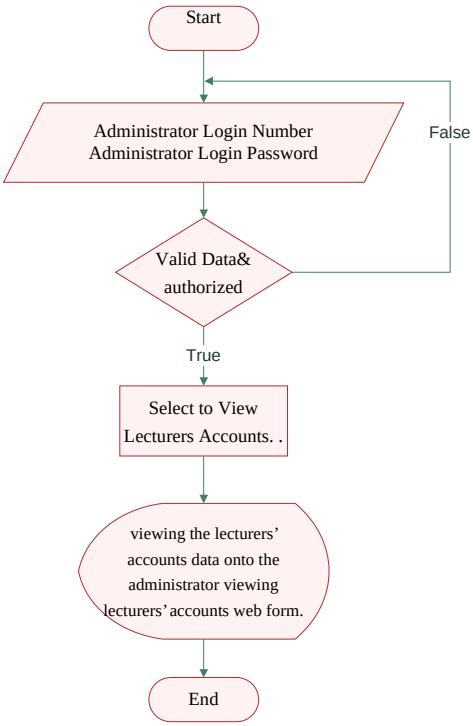


Figure 3.42: View Users Accounts Flow Chart.

- **View Guests Notes.**

  Each Administrator can login using username and password and can then view guests' notes on the site system.

A) Interface:

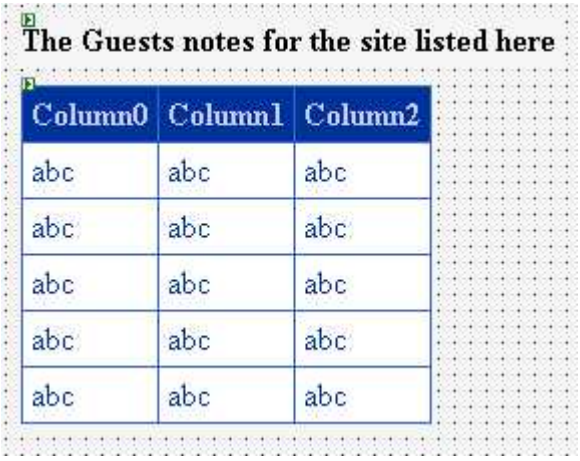
Input: selects to view guests' notes

Output: guests' notes data to be displayed on form.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

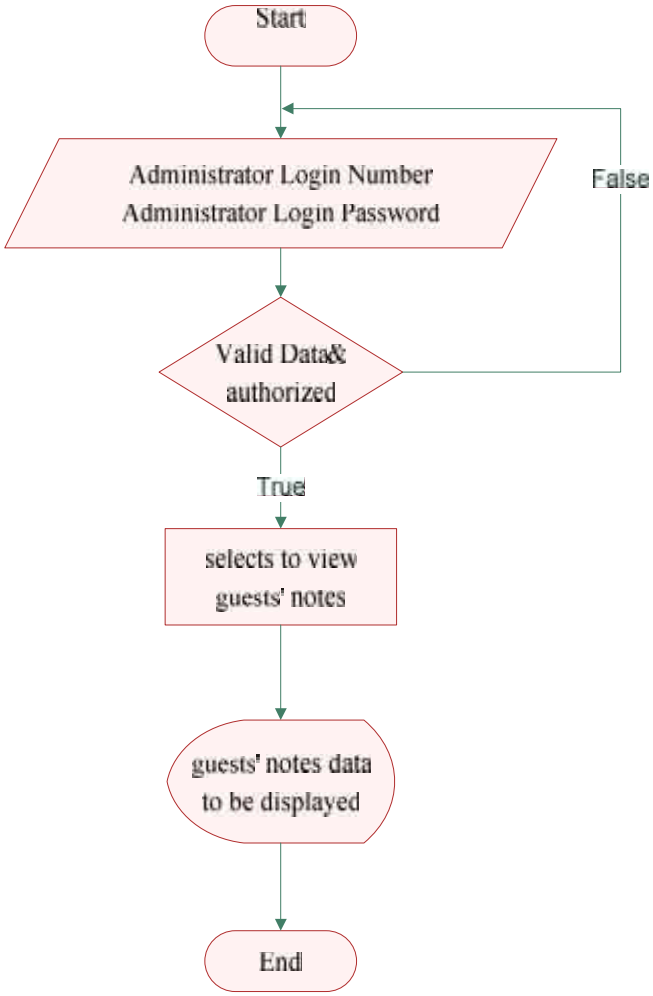


Figure 3.52: View Guests Notes Flow Chart.

- **Delete Guests Notes**

  Each Administrator can login using username and password and then can delete any guests' notes on the site system.

A) Interface:

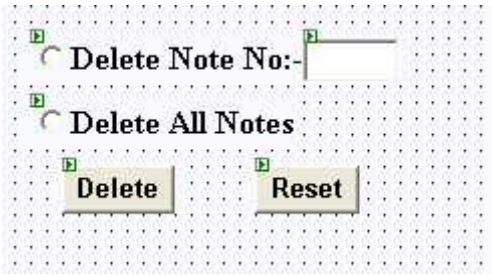
Input: note number.

Output: deleting guests' notes.

B) Constraints:

No constrains.

C) User Interface screen:



D) Flow Chart:

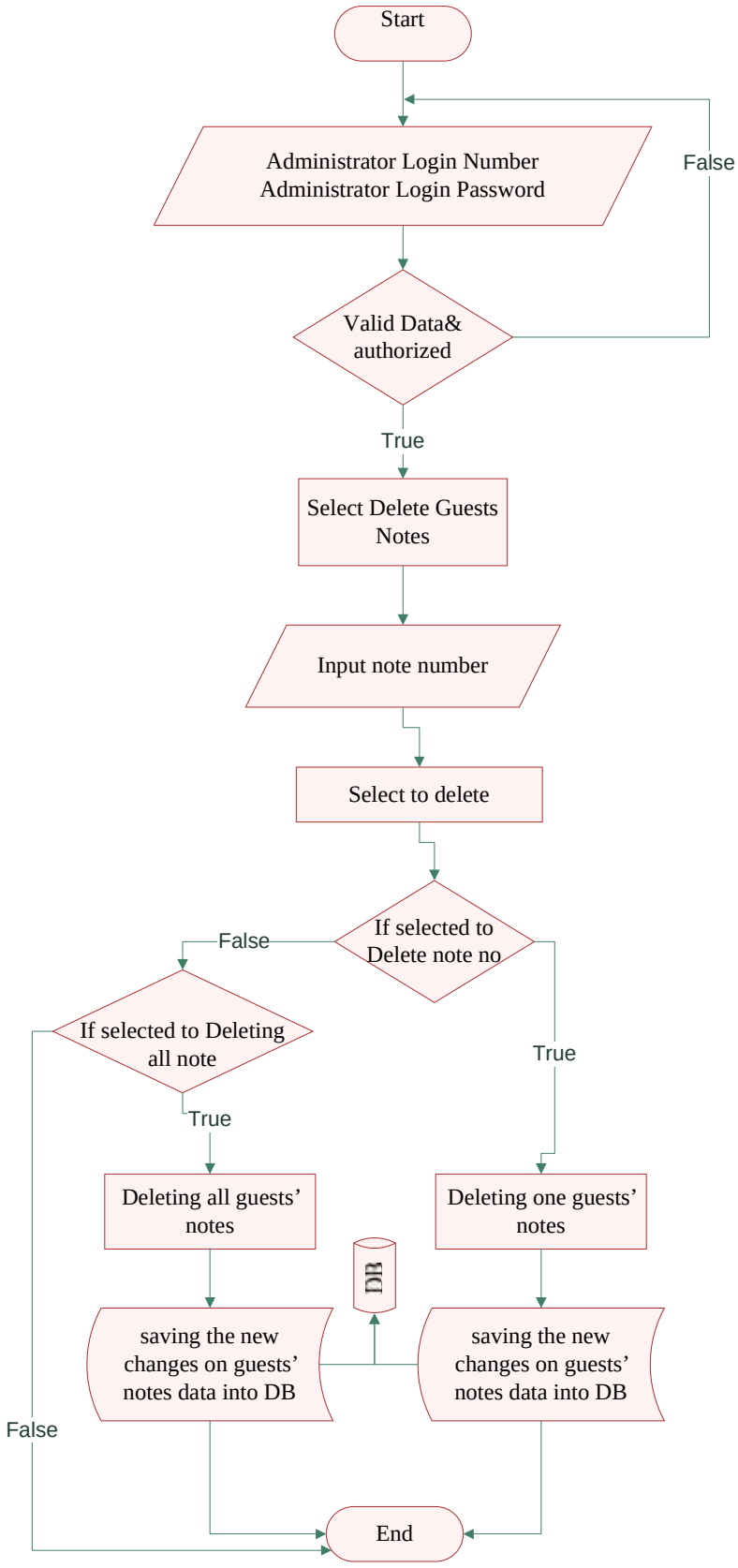


Figure 3.53: Delete Guests Notes Flow Chart.

- **Update the system design and contents.**

  Any administrator login the site with user name and password then making any updates on the system design and contents.

A) Interface:

Input: make any updates to the system.

Output: updated the system design and contents

B) Constraints:

No constrains.

C) User Interface screen:

All system pages.

D) Flow Chart:

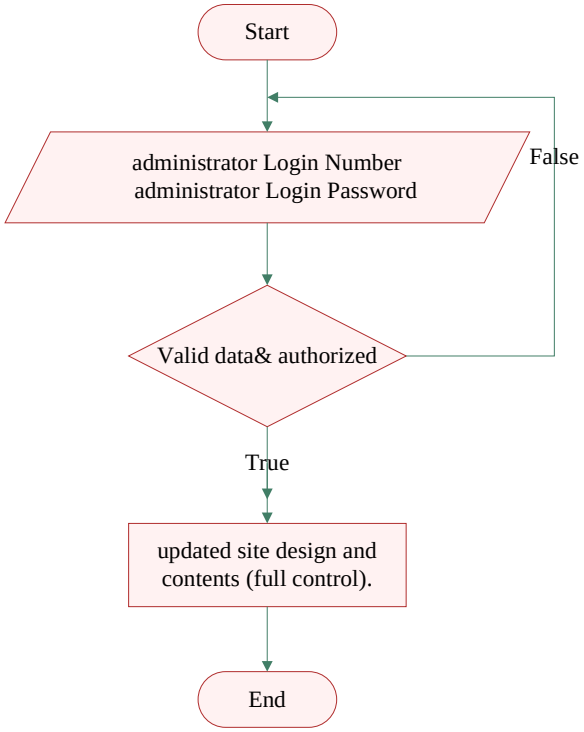


Figure 3.61: Update System contents and design Flow Chart.

3.5 Test Plan

The testing processes aims to insuring that each function and requirement of the system has been done and performed as expected, then the system as hole must be tested to insure that its subsystems acts and interacts correctly to perform the desired functions of the system.

There are more than one testing processes or types to be used to achieving the testing goals, such:

- Requirements-based testing
- Integration testing
- System testing
- Acceptance testing

The following table illustrates the expected time scheduling for the different testing processes by distributing the tow weeks that specified for the testing process in the feasibility study:

Expected time / Testing process	First week		Second week	
Requirements-based testing				
Integration testing				
System testing				
Acceptance testing				

Table 3.1: Testing Scheduling

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Chapter 4

Coding and implementation

Chapter contents:

Introduction

At System Building Stage.

At System Installation/Operation Stage.

Chapter Four

Coding and Implementation

4.1 Introduction

The implementation stage consists of two main stages. The first stage is to implement for building and programming the system, where the second stage is to implement for installing and running the system into its environment. Each of these stages involving many activities.

The following topics will be covered in this chapter:

- **At System Building Stage:** Here, we will illustrate the activities required to implement the system (building the system) such setting up the hardware requirements, creating the system database, and coding all system functions and requirements.
- **At System Installation/Operation Stage**: Here, we will illustrate the activities required to implement the system in its operational environment such fixing and setting up all the hardware requirements and installing all software programs and facilities in the system environment in order to enabling the system behave and perform more effective.

4.2 At System Building Stage.

This stage involves fixing and setting up the hardware requirements, creating the system database, and coding all system functions and requirements. An operating system must be existed such Microsoft Windows XP Professional. The hardware requirements in this stage have been described and specified at the feasibility study in system specification chapter (Chapter 1).

4.2.1 Setting up the hardware requirements

The hardware equipments that required in the system building stage have been described and specified at the feasibility study in system specification chapter (Chapter 1 section 1.6.2.1.1). These requirements and equipments must be fixing and setting up by the project team who want to develop this system.

4.2.2 Creating the system database

Creating the system database involve also creating the relations, constrains, indexes, and keys between data entities which means that building the database data specifications as mentioned in its dictionary which represented in the system design chapter(Chapter 3) .

To creating the database we need to install a database server such the SQL server 2000 and building our database on the enterprise manager. We should consider the installation guidelines of that program that will be provided during the installation process including the system installation requirements such as Intel® or compatible computer system Pentium 166 MHz or higher, 64 MB minimum and 128 MB or more recommended memory for Enterprise Edition, 560 MB minimum Hard disk space without the database size, and 800x600 or higher monitor resolution required for the SQL Server graphical tools.[1]

[1] From SQL Server help material (SQL Server Books Online)

We recommend using the SQL server 2000 since Microsoft® SQL Server™ 2000 extends the performance, reliability, quality, High Compatibility with Microsoft Visual Basic, and ease-of-use of Microsoft SQL Server version 7.0. Microsoft SQL Server 2000 includes several new features that make it an excellent database platform for large-scale online transactional processing (OLTP) and many other features.[1]

After successfully installed the SQL Server 2000 we can lunch the Enterprise Manager and starting building our "Project" database as shown in the following figures.

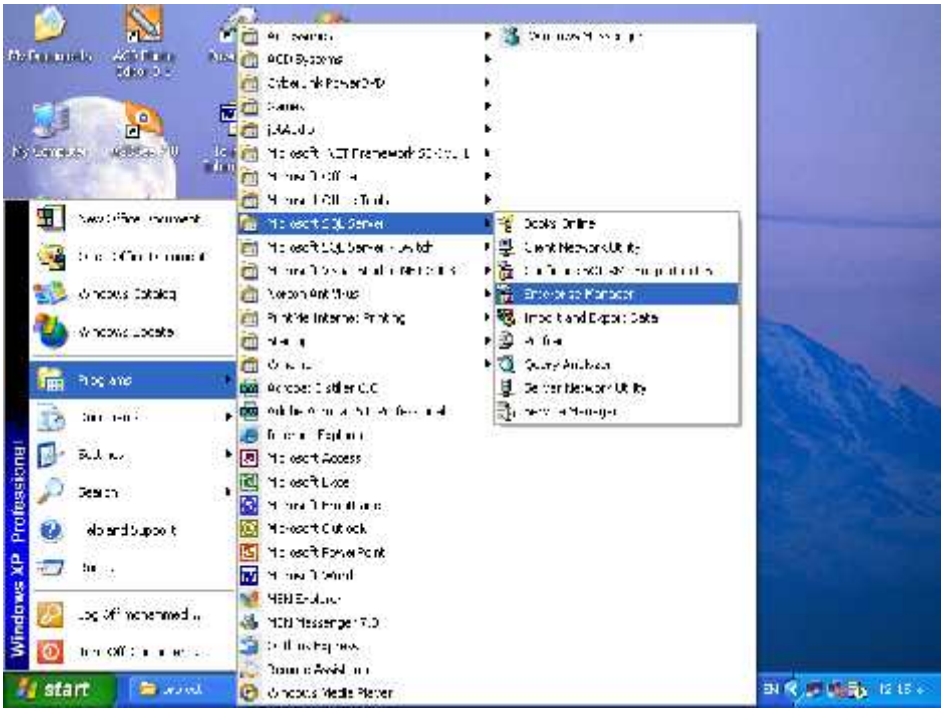

Figure 4.1: Lunching SQL Server Enterprise Manager

This figure after installation of SQL server, the project teams start to create a database specialist to project from during insert to Enterprise Manager from Microsoft SQL server that enables project teams to create the project database.

[1] The previous reference (SQL Server Books Online)

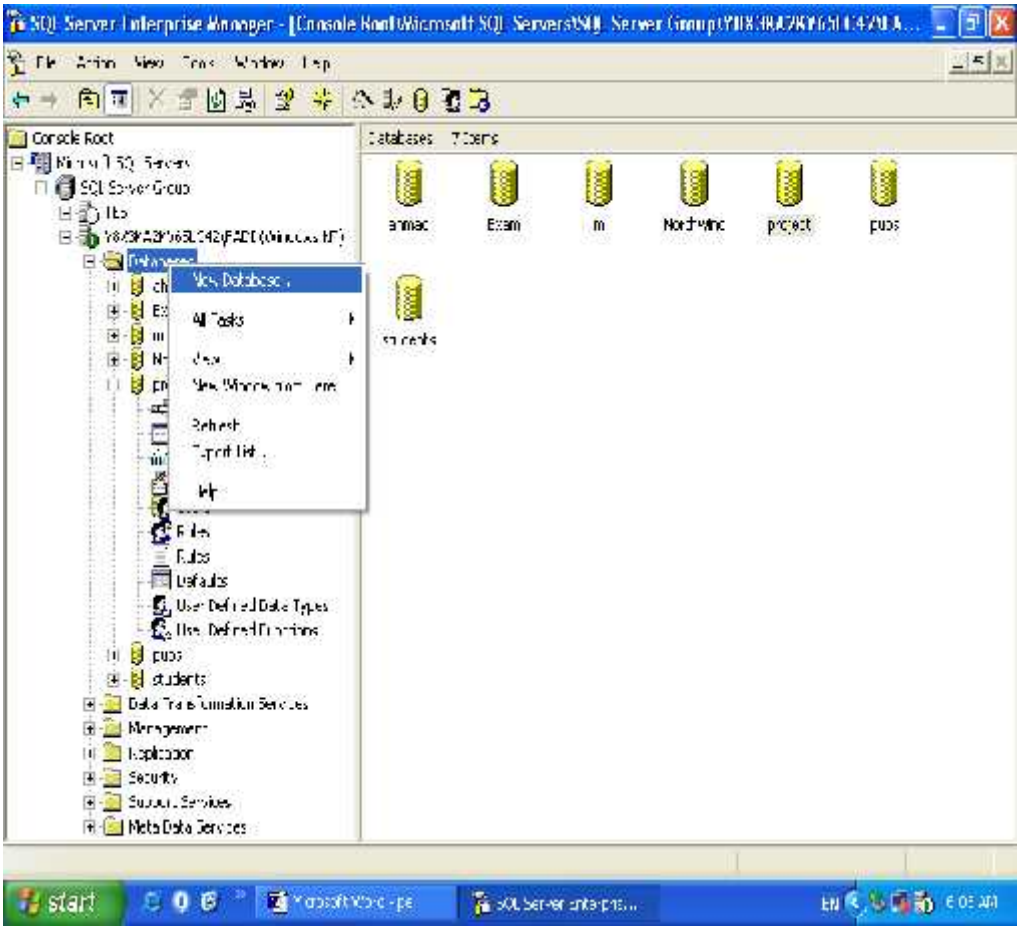

Figure 4.2: Create the "Project" Database

4.2.3 SQL Server Configurations:

Using the SQL Server properties was configured with the default configurations except security and authentication to determine the authentication mode; here we used the windows only authentication mode as shown in the following figure:

Figure 4.3: Determining the authentication mode.

Then we create a new "ASPNET" login to the "Project" database in order to be enabled accessing data. Then give the "ASPNET" user a full access of the DB.

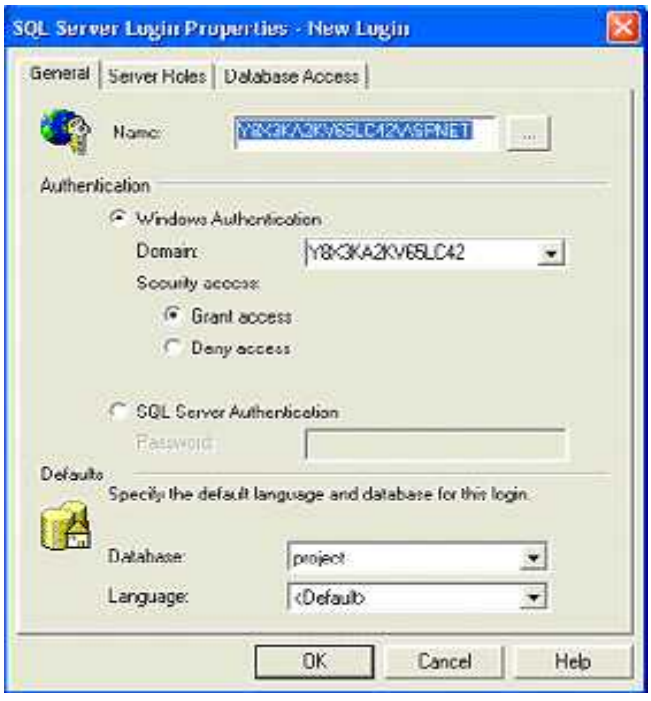

Figure 4.4: SQL server Enterprise Manager Security

4.2.4 Coding the system functions and requirements

In order to implement the system functions and requirements coding we need to install an appropriate programming language environment, here we have been installed the Visual Basic.Net programming language within the Visual Studio.Net environment that applying the ASP.NET technology.

Before installing the Visual Studio.Net environment we must install the Internet Information Services (IIS) and FrontPage Server Extensions.

From the "start" menu select "control panel" then "Add or Remove Programs" then "Add/Remove Windows Component" then from "Windows Components Wizard" check on the "Internet Information Services (IIS)" option and click next to install as shown in the following figure:

Figure 4.5: Internet Information Services (IIS).

The next step is to install the Visual Studio.Net environment following the installation guidelines appendixes with the package.

We using the Visual Studio .NET environment within the VB.Net language since it is the tool for rapidly building enterprise-scale ASP.NET Web applications and high performance desktop applications. Visual Studio includes component-based development tools, such as Visual C#, Visual J#, Visual Basic, and Visual C++, as well as a number of additional technologies to simplify team-based design, development, and deployment of your solutions.

Visual Studio.NET supports the Microsoft .NET Framework, which provides the common language runtime and unified programming classes; ASP.NET uses these components to create ASP.NET Web applications and XML Web services. Also included is the MSDN Library, which contains all the documentation for this development tools.[1]

To build the software system we lunch the Microsoft Visual Studio.Net 2003 program and creating a new project with "Project" name as shown in the following figure:

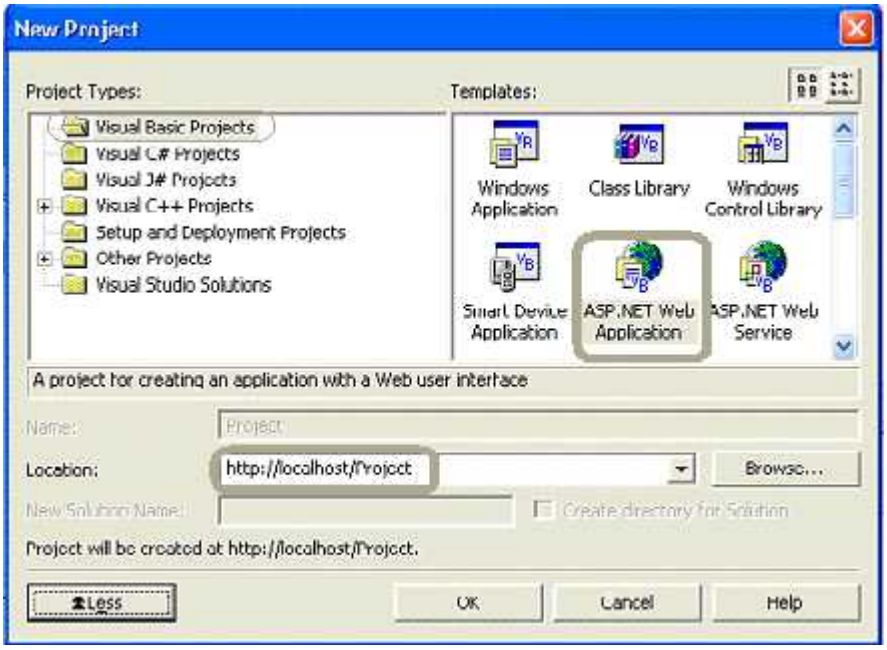

Figure 4.6: Creating New Web Application Project.

[1] From Microsoft Visual Studio.Net 2003 Documentation (help).

Then we start building the web application forms as shown in the following figure:

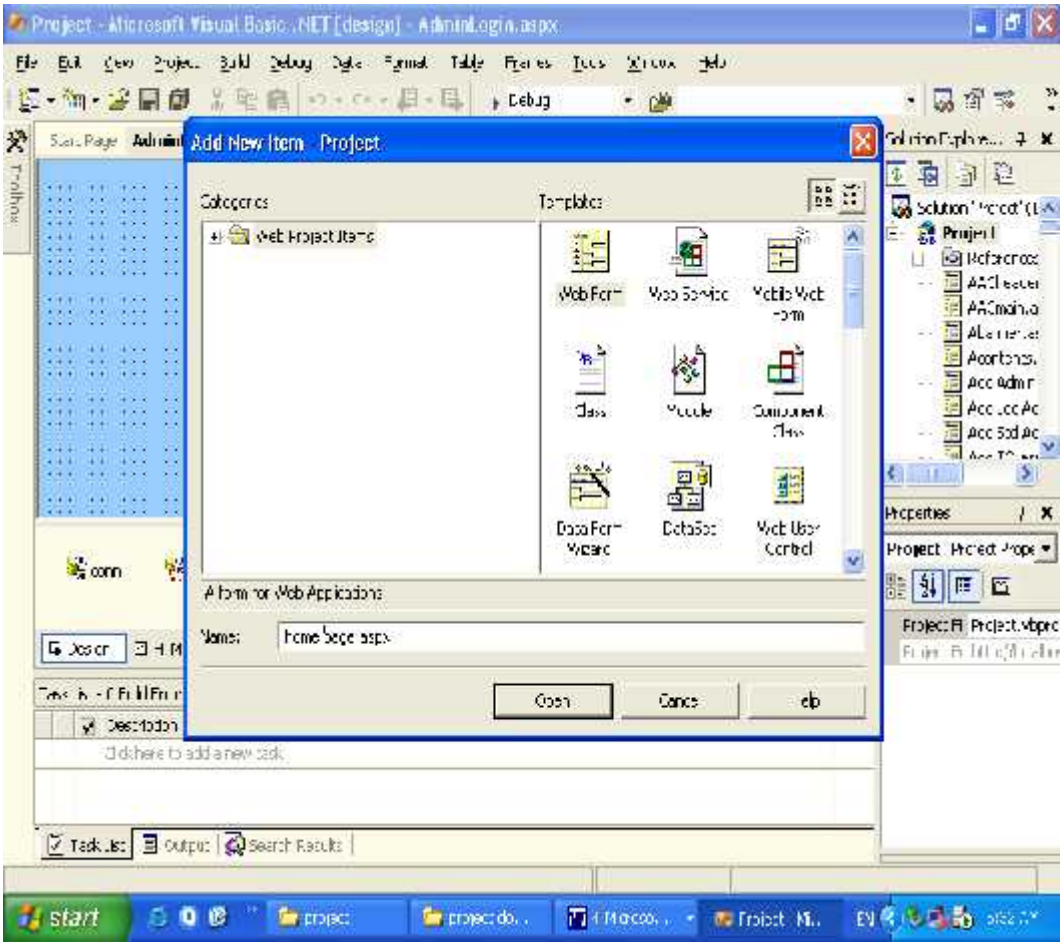

Figure 4.7: Adding New Web Forms.

A new "Project" web site automatically built on the IIS local host as shown in the following figure:

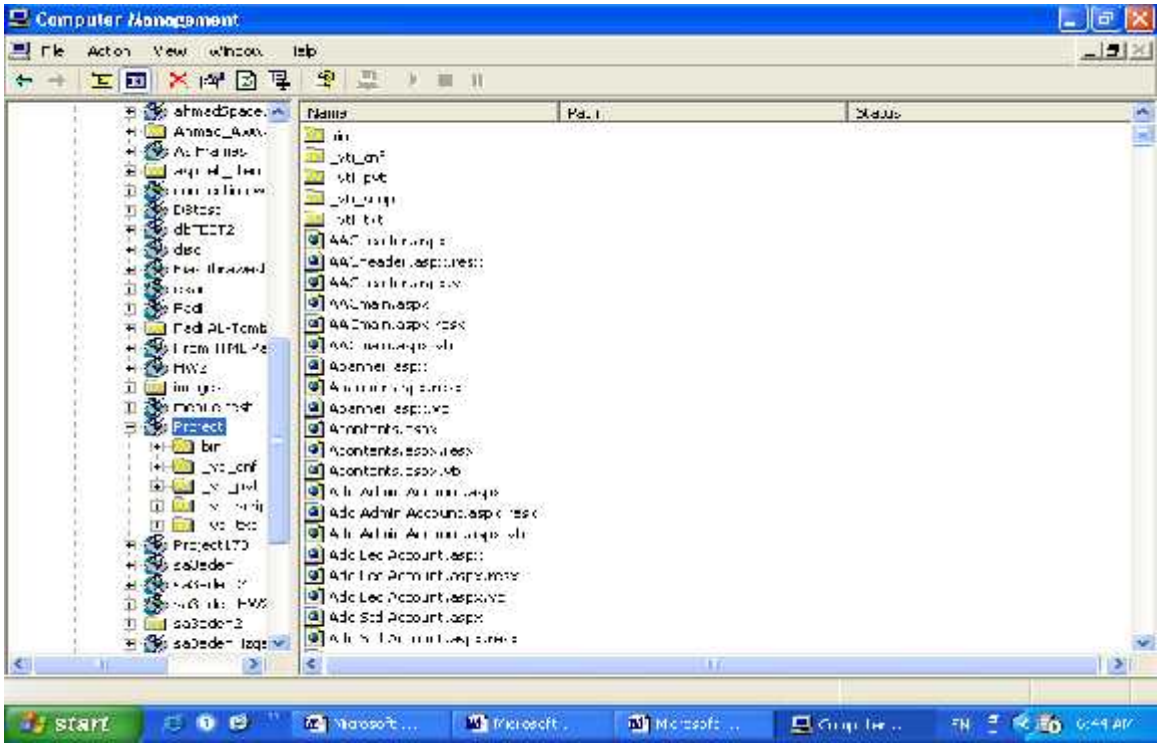

Figure 4.9: "Project" web site on IIS.

We also need to install other software programs that could be used during building and implementing of the system. Such software as Microsoft Office XP including the Microsoft Front Page (that is specified at this chapter in section 4.2.4), capturing program such CAPTURE SCRCAP2 MFC Application version 1.0.0.1. These software programs are easy to be installed following the installation guidelines that provided with the software material.

4.2.5 System backup.

During its building and developing stage, the system required to be supported with a backup storage mechanism of both its database data and its web form against any unexpected failed. Database backup achieved by copying the "Project" database file after any change on the database from its destination path on the computer running the SQL Server. System web forms and its design and code backup achieved

by copying the "Project" web application folder after any change on it from its destination path on the computer running the Visual Studio.Net application.

4.3 At System Installation/Operation Stage.

This stage involves fixing and setting up all the hardware requirements and installing all software programs and facilities in the system environment in order to enabling the system behave and perform more effective.

4.3.1 Setting up the hardware requirements

The hardware equipments that required in the system operation stage have been described and specified at the feasibility study in system specification chapter (Chapter 1 section 1.6.2.2.1). These requirements and equipments must be fixing and setting up by specialist team on the university that wants to apply this system.

4.3.2 Install a server operating system

A Server Operating System such Windows server 2003 required to be installed on both web server and data base server if there were two separate devices.

4.3.3 Install Data Base Server

The system required a Data Base server such SQL server 2000 to be installed in its working environment. The SQL Server will be responsible for managing data access and transactions during the operation stage of the system.

We have been talk about the SQL Server above in this chapter (see section 4.2.1).

4.3.4 Hosting and Domain name registration.

Hosting means that who is to be responsible for hosting and managing the system contents and design? It may be self responsibility by the university itself or external responsibility by an external Internet Service Provider.

We found that it is more effective and efficient to be self hosting responsibility rather than external one, since the use of the existing equipments and capabilities and the more flexibility to controlling and monitoring the system contents and design.

Specialist's team in the university will take the responsibility for making all facilities and requirements required to hosting an domain name registration for the site on the university web server.

4.3.5 Publishing the System Database.

The system without its database is not a completely system, it is just a browsing system without meaning or useful. So the system database must be installed or in other meaning, published, on the database server at its environment.

Since our system environment was a university environment, there are many tables data in our system database required to be retrieved from the university registration database, these tables are labeled in the System Requirements Specification chapter (Chapter 2 section 2.4.3). Other tables are to be created by the installation/operation team in the system environment following the same way in the system building stage that has been talked about in this chapter in section 4.2.2. These tables are to be structured only crated and then using the system forms to filling it with data.

4.3.6 Publishing the System (Site) Pages.

In order to publish the site web pages, specialists' team required to take his responsibility of making all facilities and requirements that required improving the publishing operation including registration for a domain name and any other step during that operation.

4.3.7 System users training and supporting.

The users of this system have to be informed about this system and have to be supported with a different ways in order to enable them using this system.

The system itself can help, support, and training its users through its online help materials and its user friendly interface.

The university must support its system's students, lecturers, and administrators with training and helping about how to use and get benefits from this system and encourage them using this system through deferent ways. Such ways are: the lecturers may be motivate his/her students to visit the site and may be left some important course materials or news to be on the site only, the university may be encourage and motivate its lecturers to use the site through providing them with a kind of an over time work.

Any guest who visits this site as a system user must provided with help and supported online materials about how to use this system and gain benefits from it.

4.3.8 System backup.

During its operational stage, the system required to be supported with a backup storage mechanism of both its database data and its web forma against any unexpected failed. Database backup achieved by copying the system database file - after any change on the database- from its destination path on the computer running the SQL Server and saving it in other destination, or making a physical storage on separate offline hard disk or any storage media. The site web forms backup is the same way.

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Chapter 5

System Testing

Chapter contents:

Introduction.

Requirement-based testing.

Integration Test.

System Testing.

Acceptance Testing.

Chapter Five

System Testing

5.1 Introduction

The testing processes aims to insuring that each function and requirement of the system has been done and performed as expected, then the system as hole must be tested to insure that its subsystems acts and interacts correctly to perform the desired functions of the system.

There are more than one testing processes or types to be used to achieving the testing goals, such:

- Requirements-based testing
- Integration testing
- System testing
- Acceptance testing

So, those are the testing types to be covered in this chapter.

5.2 Requirement-based testing.

Requirements-based testing is a Symantec approach to test case design where you consider each requirement and derive a set of tests for it. This type of testing aimed to insure that the requirements have been satisfied and achieved.

Here, the Requirements-based testing included with some of validation criteria testing.

- **Login.**

Test Set	Expected Result	Actual Result	Notes
Enter your valid user name and password.	Allow to login and passing to the next page.	Allow to login and passing to the next page.	Match
Enter invalid user name or password, or both invalid.	not allow to login	show message(you are not authorized on this system)	Match
Left user name or password null, or both null.	not allow to login	Show message to enforce entering these fields.	Match

Table 5.1: Login Testing

- **Add lectures.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter a lecture number, lecture title, lecture type, lecture date, and lecture file path.	Adding the new lecturer data to the system and making it available to the all users.	Adding the new lecturer data to the system and making it available to the all users.	Match
Select a course then enter all lecture data without lecture file path.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to enforce Adding the file.	Match
Select a course then enter all lecture data without lecture type note.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to	Match

		enforce Adding the type.	
Select a course then enter all lecture data without lecture number.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to enforce Adding the number.	Match
Select a course then enter the lecturer number as an existing number.	Don't Adding the lecturer data to the system.	Don't Adding the lecturer data to the system and showing a message to enforce change the number?	Match

Table 5.2: Add Lectures Testing

- **Delete lectures.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the lecture number to be deleted.	Deleting the specified lecture number data.	Deleting the specified lecture number data.	Match
Select a course then Select to delete all lectures on this course.	Deleting all lectures data on this course.	Deleting all lectures data on this course.	Match
Select a course then Select to delete a specific lecture without enter its number or enter characters or float data.	Don't perform this action.	Don't perform this action and show a message to enforce enter the number and in numeric and integer data type.	Match

Table 5.3: Delete Lectures Testing

- **Add Text Questions data.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter a question number, text, ideal answer, and mark.	Adding the new question data to the system.	Adding the new question data to the system.	Match
Select a course then enter all question data without text.	Don't Adding the question data to the system.	Don't Adding the question data to the system and showing a message to enforce Adding the text.	Match
Select a course then enter all question data without ideal answer or mark.	Adding the question data to the system.	Adding the question data to the system.	Match
Select a course then enter all question data including mark as float or characters data.	Don't Adding the question data to the system.	Don't Adding the question data to the system and showing a message to enforce Adding the mark as numeric data.	Match

Table 5.4: Add Text Question Testing

- **Add Choice Questions data.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter a question number, text, the three choices text, and the correct choice text.	Adding the new question data to the system.	Adding the new question data to the system.	Match
Select a course then enter all question data without question number.	Don't Adding the question data to the system.	Don't Adding the question data to the system and showing a message to enforce Adding the number.	Match

Select a course then enter all question data including question number as float or characters data.	Don't Adding the question data to the system.	Don't Adding the question data to the system and showing a message to enforce Adding the number as numeric and integer data.	Match

Table 5.5: Add Choice Questions Testing

- **View lectures.**

Test Set	Expected Result	Actual Result	Notes
Select a course with an existing lectures data on it.	Viewing the lectures data to the system.	Viewing the lectures data to the system.	Match
Select a course without an existing lectures data on it.	Don't Viewing the lectures data to the system.	Don't Viewing the lectures data to the system.	Match

Table 5.6: View Lectures Testing

- **Update Text Questions.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the question number and, a new text, a new answer, and new mark.	Updating the question data setting it to the new specified data.	Updating the question data setting it to the new specified data.	Match
Select a course then enter the question number and, a new text, a new answer, or new mark.	Updating the question data setting the Selected fields to the new specified data.	Updating the question data setting the Selected fields to the new specified data.	Match
Select a course then enter the all question data including the number as characters, float data type,	Don't perform this action.	The system Don't perform this action and enforce to enter the number with a numeric and integer data	Match

or null.		type.	
Select a course then enter the all question data including the new mark as characters or float data type.	Don't perform this action.	The system Don't perform this action and enforce to enter the mark with a numeric data type.	Match

Table 5.7: Update Text Questions Testing

- **Delete text question.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the question number to be deleted.	Deleting the specified question number data.	Deleting the specified question number data	Match
Select a course then Select to delete all questions on this course.	Deleting all questions data on this course.	Deleting all questions data on this course.	Match
Select a course then Select to delete a specific question without enter its number or enter characters or float data.	Don't perform this action.	Don't perform this action and show a message to enforce enter the number and in numeric and integer data type.	Match

Table 5.8: Delete Text Questions Testing

- **View text question.**

Test Set	Expected Result	Actual Result	Notes
Select a course with an existing questions data on it.	Viewing the questions data to the system.	Viewing the questions data to the system.	Match
Select a course without an existing questions data on it.	Don't Viewing questions data to the system.	Don't Viewing questions data to the system.	Match

Table 5.9: View Text Questions Testing

- **Update Choice Questions data.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the question number and, a new text, a new choices, and new correct choice.	Updating the question data setting it to the new specified data.	Updating the question data setting it to the new specified data.	Match
Select a course then enter the question number and, a new text, a new choices, or new correct choice.	Updating the question data setting the Selected fields to the new specified data.	Updating the question data setting the Selected fields to the new specified data.	Match
Select a course then enter the all question data including the number as characters, float data type, or null.	The systems Don't perform this action.	The system Don't perform this action and enforce to enter the number with a numeric and integer data type.	Match

Table 5.10: Update Choice Questions Testing

- **Delete Choice Questions data.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the question number to be deleted.	Deleting the specified question number data.	Deleting the specified question number data	Match

Select a course then Select to delete all questions on this course.	Deleting all questions data on this course.	Deleting all questions data on this course.	Match
Select a course then Select to delete a specific lecture without enter its number or enter characters or float data.	Don't perform this action.	Don't perform this action and show a message to enforce enter the number and in numeric and integer data type.	Match

Table 5.11: Delete Text Questions Testing

- **View Choice Questions data.**

Test Set	Expected Result	Actual Result	Notes
Select a course with an existing questions data on it.	Viewing the questions data to the system.	Viewing the questions data to the system.	Match
Select a course without an existing questions data on it.	Don't Viewing questions data to the system.	Don't viewing questions data to the system.	Match

Table 5.12: View Choice Questions Testing

- **Add advertisement.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter an advertisement number, title, date, and text.	Adding the new advertisement data to the system and making it available to the all.	Adding the new advertisement data to the system and making it available to the all.	Match
Select a course then enter all advertisement data without text.	Don't Adding the advertisement data to the system.	Don't Adding the advertisement data to the system and showing a message to enforce Adding the text.	Match
Select a course then enter all advertisement data	Don't Adding the advertisement data to the	Don't Adding the advertisement data to the	Match

without the number.	system.	system and showing a message to enforce Adding the number.	
Select a course then enter the advertisement number as inexistent number.	Don't Adding the advertisement data to the system.	Don't Adding the advertisement data to the system and showing a message to enforce change the number?	Match

Table 5.13: Add Advertisements Testing

- **Delete advertisement.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the advertisement number to be deleted.	Deleting the specified advertisement number data.	Deleting the specified advertisement number data	Match
Select a course then Select to delete all advertisement on this course.	Deleting all advertisement data on this course.	Deleting all advertisement data on this course.	Match
Select a course then Select to delete a specific advertisement without enter its number or enter characters or float data.	Don't perform this action.	Don't perform this action and show a message to enforce enter the number and in numeric and integer data type.	Match

Table 5.14: Delete Advertisements Testing

- **Send replies to students.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter a student number, question number, reply text, and Select to send reply to all	Adding the new reply data to the system and making it available to the asked student and to the all	Adding the new reply data to the system and making it available to the asked student and to the all	Match

course students.	course students.	course students.	
Select a course then enter a student number, question number, and reply text.	Adding the new reply data to the system and making it available only to the asked student.	Adding the new reply data to the system and making it available only to the asked student.	Match
Select a course then enter all reply data without the text.	Don't Adding the reply data to the system.	Don't Adding the reply data to the system and showing a message to enforce Adding the text.	Match

Table 5.15: Send Replies Testing

- **Chang Password.**

Test Set	Expected Result	Actual Result	Notes
enter lecturer number, old password, new one, and confirm it.	Changing the old password setting it to the new one.	Changing the old password setting it to the new one.	Match
Don't enter lecturer number, old password, new one, and confirm it.	Don't perform this action.	Don't perform this action and showing a message to enforce entering these fields.	Match
enter all fields and left the number field null , in incorrect format or type, or entering a non existing number.	Don't perform this action.	Don't perform this action and showing a message to enforce entering the number and in its appropriates format and type.	Match

Table 5.16: Changing Password Testing

- **View advertisement.**

Test Set	Expected Result	Actual Result	Notes
Select a course with an existing advertisement data on it.	Viewing the advertisement data on the system.	Viewing the advertisement data on the system.	Match
Select a course without an existing advertisement data on it.	Don't Viewing advertisement data to the system.	Don't Viewing advertisement data to the system.	Match

Table 5.17: View Advertisements Testing

- **Answering on Text Questions.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter a question number and answer text.	Adding the answer data to the system.	Adding the answer data to the system.	Match
Select a course then enter a question number and Don't enter the answer text.	Don't Adding the answer data to the system.	Don't Adding the answer data and showing a message to enforce entering the answer text.	Match
Select a course then enter all answer data including the question number null, in incorrect type, or not existing number.	Don't Adding the answer data to the system.	Don't Adding the answer data and showing a message to enforce entering the question number and in its appropriate type and format.	Match

Table 5.18: Answering on Text Questions Testing

- **Ask Lecturers.**

Test Set	Expected Result	Actual Result	Notes
Select a lecturer and a course then enter a question number and text.	Adding the question data to the system.	Adding the question data to the system.	Match
Select a lecturer and a course then left a question number or text null or including the number at incorrect type or format.	Don't Adding the question data to the system.	Don't Adding the question data to the system and show a message to enforce entering those fields and with their appropriate formats.	Match
Select a lecturer and enter all question data but left the course null.	Adding the question data to the system.	Adding the question data to the system as a general question to the lecturer.	Match
enter all question data but left the lecturer null.	Don't Adding the question data to the system.	Don't Adding the question data to the system and show a message to enforce select a lecturer.	Match

Table 5.19: Ask Lecturers Testing

- **Answering on Multiple Choice Questions.**

Test Set	Expected Result	Actual Result	Notes
Select a course then enter the question number and Select the correct choice.	Increment the result by 1 if the Selected correct choice matches the actual one and keeping the result as it if mismatches occurs.	Increment the result by 1 if the Selected correct choice matches the actual one and keeping the result as it if mismatches occurs.	Match
Select a course then left the question number and the correct choice nulls.	Don't perform any action.	Don't perform any action an showing a message to enforce enter those fields.	Match

Table 5.20: Answering on Choice Questions Testing

- **Add User Account.**

Test Set	Expected Result	Actual Result	Notes
enter valid user name and valid password	Add this account to the system.	Add this account to the system.	Match
enter a non existing user name and valid password	Don't add this account to the system.	Don't add this account to the system and showing a message (this lecturer is unregistered).	Match
enter an existing user name and an existing password	Add this account to the system.	Add this account to the system.	Match
enter a null or incorrect format or type user name and valid password	Don't add this account to the system.	Don't add this account to the system and showing a message to enforce entering the number and in its correct format and type.	Match

Table 5.21: Add User Account Testing

- **Delete User Account.**

Test Set	Expected Result	Actual Result	Notes
Enter a user name to delete its account on the system.	Deleting the specified lecturer account data.	Deleting the specified lecturer account data.	Match
Select to delete all users' accounts on the system.	Deleting all lecturers accounts data on the system.	Deleting all lecturers accounts data on the system.	Match
Select to delete a specific account without enter its number or enter characters or float data.	Don't perform this action.	Don't perform this action and show a message to enforce enter the number and in numeric data type.	Match

Table 5.22: Delete User Account Testing

- **View Users Accounts.**

Test Set	Expected Result	Actual Result	Notes
Select to display users accounts on the system.	Displaying the users accounts data.	Displaying the users accounts data.	Match

Table 5.23: View Users Accounts Testing

- **Deny Users Accounts.**

Test Set	Expected Result	Actual Result	Notes
Enter a user name to deny its account on the system.	Denying the specified lecturer account data.	Denying the specified lecturer account data.	Match
Select to deny all users accounts on the system.	Denying all lecturers accounts data on the system.	Denying all lecturers accounts data on the system.	Match
Select to deny a specific account without enter its number or enter characters or float data.	Don't perform this action.	Don't perform this action and show a message to enforce enter the number and in numeric and integer data type.	Match

Table 5.24: Deny Users Accounts Testing

- **Activate Users Accounts.**

Test Set	Expected Result	Actual Result	Notes
Enter a user name to activate its account on the system.	Activating the specified lecturer account data.	Activating the specified lecturer account data.	Match
Select to activate all users accounts on the system.	Activating all lecturers accounts data on the system.	Activating all lecturers accounts data on the system.	Match
Select to activate a specific account without	Don't perform this action.	Don't perform this action and show a message to	Match

enter its number or enter characters or float data.		enforce enter the number and in numeric and integer data type.	

Table 5.25: Activate Users Accounts Testing

5.3 Integration Test

System integration mean that the system is to be built through integrate its subsystems and parts into one system. So System integration testing aims to find out and recover all problems or defects that may be arise during the system components interactions. The following is an example:

After Adding new lectures, questions, or advertisements in the lecturer subsystem, then these lectures, questions, or advertisements are available to other intended subsystems such student one. Also, any updates to that data will be reflected directly to other intended subsystems.

So, and after performing many such that test cases on the different system subs, we insure that its subsystems interact in a correct manner.

5.4 System Testing

Here, are some snapshots of the most important requirements and functions in the system. These snapshots illustrate how the user can input the data then how that data will be stored in the system database.

- Add new lecture:

The following form used by both lecturer and administrator to add new lectures data on the system. The data are stored in the "Lectures" table in database as shown in the following table figure (5.2).

Figure 5.1: Adding new lecture web form

LNo	CourseNo	LTitle	LDate	LType	LFile
1	4614	Methods	5/8/2005	text	4614-1.DOC
1	4615	Data Reader	5/8/2005	text	4615-1.bmp
3	4614	Applets 2	4/19/2005	text	4614-3.DOC
3	4615	XML	4/20/2005	video	4615-3.bmp

Figure 5.2: lectures database table.

- Ask lecturer:

The following form used by the student to send questions or notes to his/her lecturers. The data are to be stored in the "QAndNotesExchanges" table in database as shown in the next table figure (5.4).

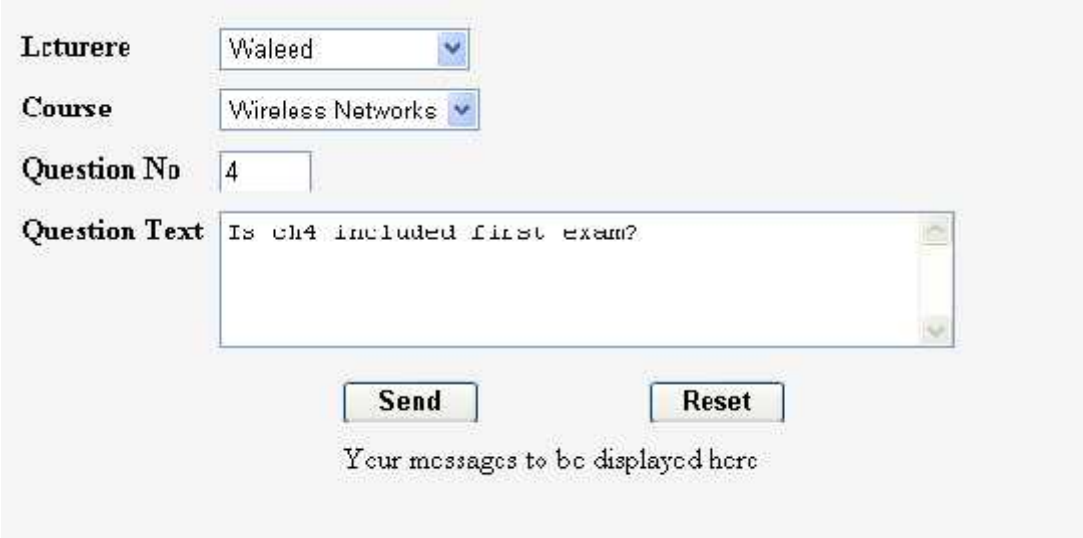

Figure 5.3: Ask lecturer web form

QNo	LecturerNo	CourseNo	QText	StdNo	ReplyText
:	3	4614	when to get your W#2	1009	tomoro.
:	8	4618	is there a meeting this Thursday.	1089	yes...yes ..
:	3	4615	for what we used DataReader?	10233	for faster access.
	8	4618	what is mobile networks?	10233	networks that allow move
:	1	4273	pleas want to meet you with the project team if there s no mbarriers...	10857	<NULL>
:	3	4615	hy.. is there a lectur tomoro?	10857	of course.
:	8	4618	when you want us to present the report ?	10857	today
2	3	4615	at what date the first exam at???	10233	at 1/12/2008
2	0	4610	is ch4 included in the first exam material???Plase????	10233	no
3	3	4615	what is XML ?	10233	used to translate data ea
3	8	4618	Is ch4 included first exam?	10233	<NULL>

Figure 5.4: Questions Exchanges table.

- Reply on students questions:

The following form used by the lecturer to send replies for his/her students' questions. The data are to be stored in the "QAndNotesExchanges" table in database as shown in the next table figure (5.6) and in "ToAllAns" table if the lecturer wants to generalize this reply to all his/her students as shown in the next table figure(5.7).

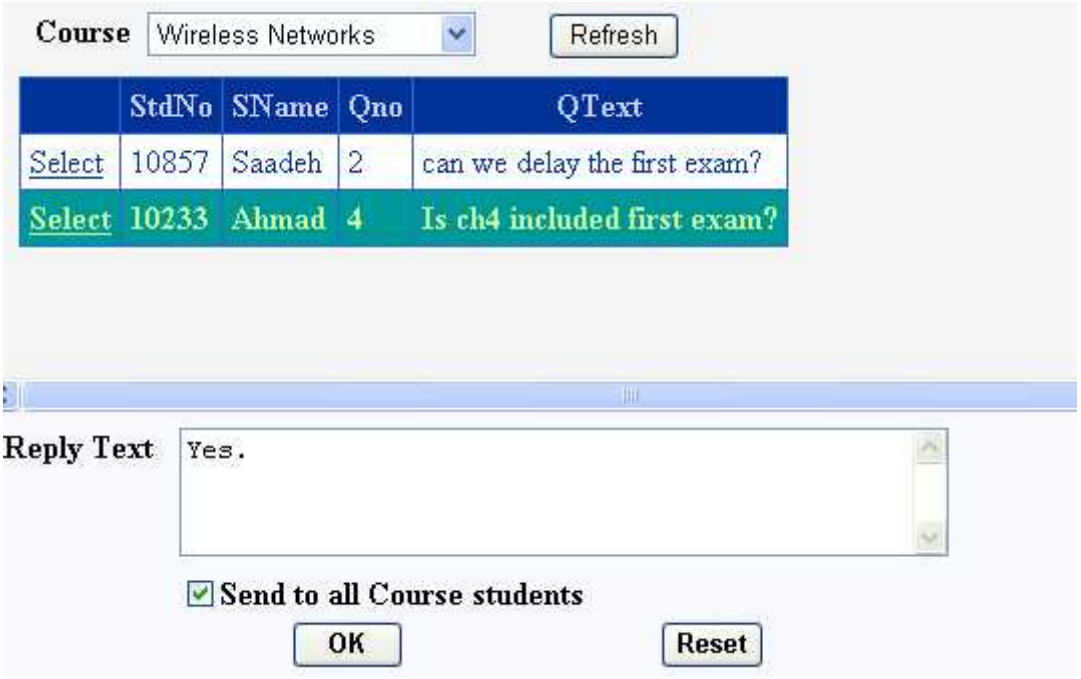

Figure 5.5: Reply on students questions web form.

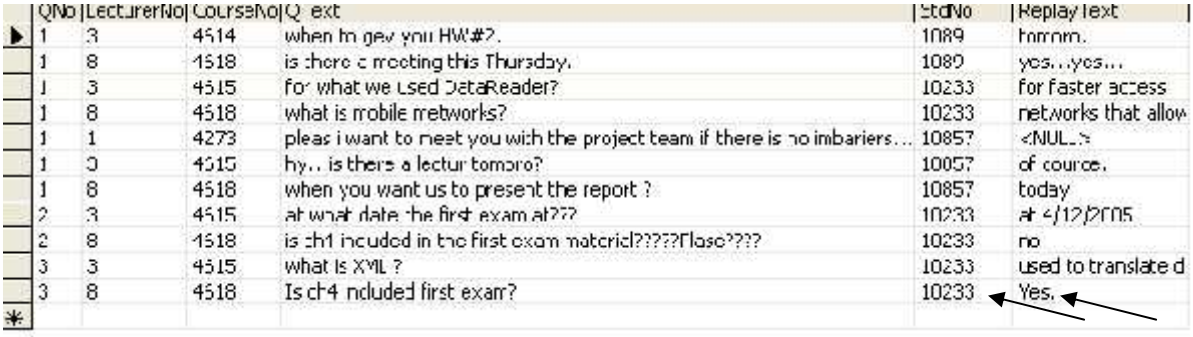

Figure 5.6: Questions Exchanges table.

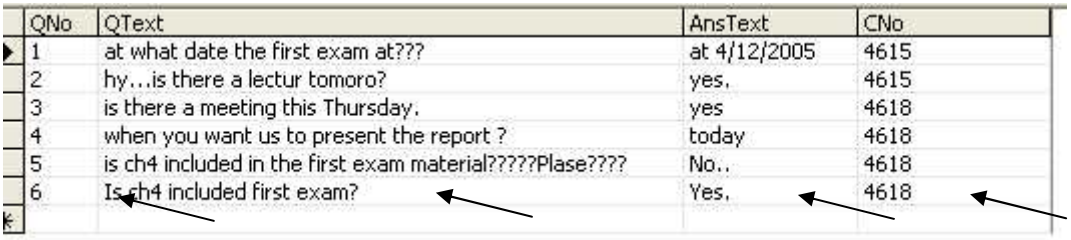

Figure 5.7: To All Answers table.

- Send notes on site.

  The following form used any site guest including students and lecturers to send notes on the site to the site administration. The data are to be stored in the "NotesForSiteAdmin" table in database as shown in the next table figure (5.9).

Figure 5.8: Send notes on site web form.

	NoteNo	NoteText	Positione
▶	23	there is no advantegs we gain from this site.	student in ppu.
	24	this is agood interface and system.....	a student at Hebron University.
	25	thank you for this site.	student in HU
*			

Figure 5.9: Notes on site table.

After applying the same operation on all system functions using its forms, we resultant to that all of them are perform correctly and as expected, so the system testing process is complete successfully.

5.5 Acceptance Testing:

Here, the system is to be tested against its requirements design and implementation to see where it performs as the users expected and satisfying their requirements or not.

The system has been tested by many students users some of them are PPU students, the result was: it is ok.

Also the system tested by many PPU lecturers and with the same result as students.

After perform this process of testing we resultant to that all system users' requirements are designed and implemented in an appropriate and simple way that makes the users interface and interaction with the system more easily and stably since users doesn't need to make any ambiguous or difficult action through the system interface. The requirements designed interfaces are constructed from the natural and traditional work way of the users: students, lecturers, administrators, and guests.

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Chapter

6

System Maintenance

Chapter contents:

Introduction

How to run the system in its environment?

How to update the system?

How to backup the system contents?

Chapter Six

System Maintenance

6.1 Introduction

After the system installed in its operational environment the need to provide new requirements will be required or a system failure may be occurred. These conditions (if occurs) mains that the system need to be maintained in order to solve those conditions and recover the system.

This chapter will cover the following related topics in system maintenance:

- How to run the system in its environment?
- How to update the site pages contents and design including adding new services or removing existents?
- How to updating the system database (adding or deleting tables, rows, or columns)?
- How to backup the system contents?

6.2 How to run the system in its environment?

In order to installing and running the system in its operational environment we need to:

- Fix its hardware and software requirements which have been mentioned in the feasibility study in chapter one section (1.6.2.2).
- Apply the system implementation steps that have been mentioned in chapter four section (4.3).

6.3 How to update the system?

6.3.1 Database update.

Any authorized user such the system administrator can access the system database adding, deleting, or updating data (columns, rows, or application data in tables). You can add new tables by right click on the **Tables** icon that located within the **project** database then select **New Table** , the new table will be opened in the design mode so you can build your table specifications.

To make any updates to an existing table(delete, add, or change column specification), open it in the design mode by right click on that table and select **Design Table** item. There are many choices in the right clicked menu on table name such Delete, Rename…

6.3.2 Site pages update.

The system administrators can update each site page by opening it in the Visual Studeo.Net environment, this process don by creating a new empty web application named "**Project**" (as shown in chapter four section 4.2.4), then copying all files from the old "**Project**" site directory and pasting it in the new "**Project**" directory, then re lunch the new web application to refresh its contents.

After that you can open any form in the design mode and make any updated in its contents and design using the software design facilities and tools.

6.4 How to backup the system contents*?*

6.4.1 Database Backup.

During its operational stage, the system required to be supported with a backup storage mechanism of its database data against any unexpected failed. Database backup achieved by copying the system database file and saving this file on the external device that of the system developed, after any change on the database- from its destination path on the computer running the SQL Server and saving it in other destination, or making a physical storage on separate offline hard disk or any storage media by using the ways that is presented by manufacturing company for DBMS such as the SQL server used in a specialist project team. The SQL server offers many selections that uses in backup among of self database.

6.4.2 Site pages Backup.

During its operational stage, the system required to be supported with a backup storage mechanism of its web form against any unexpected failed. The site web forms backup achieved by copying the "**Project**" site directory that contains all forms and saving it at a separate offline storage medium to be restored at any later time.

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Chapter Seven

Recommendations

7.1 Introduction

In this chapter we will provide many recommendations and further working on our system in order to improve its services.

7.2 Recommendations

The project team strongly recommended for PPU Academic Supporting System. Also we are recommended for the following works and enhancements on the system:

- Providing a mechanism of building an exam application that consist of the two questions types (text and multiple choice questions) and governs with specific period of time.
- Building a mechanism of exchanges notes and questions between students and lecturers through the use of mail server exchanges and building accounts for each student and lecturer.
- Providing new services in the system such as:
    - The ability of viewing the final students' results and marks.
    - Providing lectures in an audio and video conferencing form.

Also there are many others services and enhancements to be made on the system.