Credit Transfer and Course Exemption System

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Certificate

I accept the work contained in this report titled "Credit Transfer and Course Exemption System" written by **Mr. Haseeb Tahir** as a confirmation to the required standard for the partial fulfillment of the degree of Bachelor of Science in Computer Science.

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Dedication

I would like to dedicate this project to our parents who always motivated us towards the education.

Acknowledgements

Abstract

This project automates the Bahria University (BU) Credit Transfer and Course Exemption System. This system deals with two categories of students: one who after taking admission in BU apply for transfer of credit hours completed at previous university/ the parent university. Second is the category of those BU students who change their degree program in BU either because of failure or after successful completion of one degree they join a different program. For example a student fails to complete BS(CS) and then decides to take admission in BS(IT). The second example may be after successful completion of BS(CS), students goes for MBA. The application is developed using C# methodologies and SQL database.

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Chapter 1
Introduction

1.1 Introduction

The Credit Transfer and Course Exemption System (CTCES) is an automated solution for Bahria University. The complicated and very long procedures will be made simple, efficient and secure. CTCES will have two major components:

1. Credit Transfer: this system is divide into two namely:
   a. External Credit Transfer
   b. Internal Credit Transfer
2. Course Exemption System.

1.2 Objective

To automate a credit transfer and course exemption system for Bahria University.

1.3 Problem Description

Currently Credit transfer and course exemptions are being handled manually, which is cumbersome, insecure, and time consuming. The credit transfer system has two subsystems namely:

i) **Credit transfer External:** After the student has been applied admission in Bahria University the student applies for credit transfer, this happens in the case when in the same degree student has complete some courses from his/her Parent University(where the student actually started the degree):
   - The eligibility criteria to apply for credit transfer is checked
   - Parent University must be recognized from HEC (Higher Education Commission).
   - CGPA must be above or equal to 3.
   - NOC (No Objection Certificate) from Parent University must be attached.
   - Student must study at least 50% of credit hours from Bahria University.
   - Course exemption will only be applied on those courses with the GPA 2.5 or Grade "C+".
   - The eligible courses outline (Course content) will be attached (hard copy), the soft copy will be uploaded on the student CTCES section.
   - The case is then forwarded to the coordinator. The coordinator forwards each request to the concerned subject specialist.
   - After receiving the recommendations from the subject specialists the committee make a summary with final recommendations and forward it to the HOD.

ii) **Credit transfer Internal:** It is concerned with students of Bahria University, who change their department before the completion of a degree.
   - Student must have been enrolled in any other department.
   - Student has not been drop from previous department.

- Courses with the same course code and same credit hours will only be exemptible.
- Tuition fees will be adjusted according to university rules.

iii) Course Exemption: Administrator deals the Course exemption, with courses of the students who after adding the desired course in either CTE or CTI will exempt them.

1.4   Methodology

I gather the requirements from the concerned personnel. The gathered data then been implemented on the project. Technically the system is developed using C#, databases, and few other techniques of management information systems.

1.5   Project Scope

The system at first stage is made only for Bahria University Islamabad Campus hence there will be no distributed environment. But it can be enhanced and will be used in all the other campus of Bahria University.

1.6   Feasibility Study

i. **Risks Involved**: The risks that involved in the CTCES are following.
   - Student enter the wrong enrollment.
   - Select the wrong department, not the one which he/she wishes for.
   - Upload the wrong outline against a specific course.
ii. **Resource Requirement**: a laptop/desktop which can run **visual studio 10 or greater, windows 7, processor 2.40GHz**.No extra hardware or software will be required for the project.

1.7   Solution Application Areas

The project will help Bahria University to transfer credit hours and exempt the courses in a computerized manner. This will resolve the existing problems and can become a part of Bahria University Information System.

Chapter 2
Literature Review

2.1 CTCES AUTOMATED SYSTEM IN BAHRIA UNIVERSITY

This part will be explaining how currently in Bahria University credit transfer and course exemptionis handled.

2.1.1-For Credit Transfer

There are further two types of Credit Transfer.
1- External Credit Transfer
2- Internal Credit Transfer

2.1.1.1 External Credit Transfer

In external credit transfer the students from the other universities of Pakistan (approved by HEC) who desired to transfer their credit hours to Bahria University will have to follow this procedure.
1. Both universities must be approved by the HEC.
2. Their degree has not been cancelled/drop from the previous university.
3. They are not Expelled from their previous university
4. Before applying they must know that they have to study 50% of their courses in Bahria University.
5. Course content has to match 60% for exempting a course otherwise that course will not be exempted.
6. Courses with only grade C+, 67% or above will be eligible to exempt.
7. Students must have to apply About 2 months before the start of a new semester.
8. Tuition fees will be adjusted according to university rules.

After those requirements are fulfilled the case is been forwarded to course coordinator of that specific department. The CC make the lists of that student courses with grade C+, 67% or higher and then sent each course with its course outline of both universities to respective teachers, those teachers compare those 2 outlines and sent the report back to CC whether that course is exemptable or not.

2.1.1.2 Internal Credit Transfer

In internal credit transfer the students from the Bahria University who desired to transfer their credit hours to other department will have to follow this procedure.
1. Student must have been enrolled in any other department.
2. Courses with the same course code will only be exemptable.
3. Student has not been drop from previous department.
4. Courses with only grade C or above will be eligible to exempt.
5. Students must have to apply About 1 months before the start of a new semester.
6. Tuition fees will be adjusted according to university rules.

After those requirements are fulfilled the CC of the required department will enter the details of that student and his/her courses to their department one by one.

2.1.2-For Course Exemption

In course exemption the student with having the duel degree from the Bahria University will be facilitated. The course which that student have studied in his/her previous degree with the same course code will be exempted, students will have the option to exempt that course or study again if they wanted to there will be no restrictions of the grade policy in that module.

2.2 RELATEDWORK

In 1997 the academic director of Cleveland Institute of Electronics Mr. Ali Fares published a research paper 15 strategies for helping students transfer credits [], in which he explain the difficulties faced by the students to transfer their credits to other institutes.Institutes usually have the limits that how much transfer credit they will accept. An institution may accept credits and post them to a student's transcript, but these may not necessarily apply toward graduation in a given field of study. In this case, the accepted credits would be treated as "electives" and would not be used to meet any specific graduation requirements.

2.2.1 PROBLEM STATEMENT

These were the factors that were given in that article which were affecting student transfer credits.

2.2.1.1 Institute or University policies on transfer and types of credit:

Most Institutes and Universities have policies about the number of credits they will transfer from one institution another institution. In Bahria University the rule is the student have to complete 50% of their credits from Bahria to earn the degree of respective university.

2.2.1.2 Appropriateness of the course:

Does the course the student completed fit into the University's degree program? Each degree program has specific credit requirements. If the credit the student earned doesn't fulfill specific requirements, and they have already completed all of the elective courses, then they may have credit that has transferred but cannot be applied to their degree. In addition, some courses may not be relevant to the degree they are currently pursuing.

2.2.1.3 Comparability of the course:

Does the content of the course compare favorably with the topics in the courses that are in the
University's current degree curriculum? Because comparability of course content is important, the student should be prepared to discuss how the course he or she completed includes the topics required in the college course.

2.2.1.4 Grade received in a course:

SomeUniversitieshaveapolicythatrequiresacoursegradebeforeaccepting it fortransfercredit. MostUniversitieshaveapolicyabouttransferofcreditswith thegradeof "C." Some Universities will accept these credits as long as they are not in courses in the student's major.

2.2.2 CTCES Development:

The main objective of this project is to develop an auto-mated system, earlier it was done manually in Bahria University. As it has stated earlier it will have three modules.

Processes

External Credit transfer:

It is the main and core module of this project. In external credit transfer the requirements are check first that those courses can be exempted then there will be a matching experiment between two files one file will be from host university with the course contents on it of that particular course and the other file will be from the previous university with having course contents on them of that particular course in their university. Those two files will be match then with the help of an algorithm and if their contents are equal to 60% or more then that course will be exempted otherwise it will not be exempted. If the course can be exempted then we have to fill the details of that course.

Internal Credit transfer:

In order to access the courses of previous department the enrollment number of that department will be entered and then we can exempt the desired courses against the new enrollment of new department, in order to exempt a course the grade must be equal to or higher then C.

Chapter 3
Software Requirement Specifications

3.1 Functional and Non Functional Requirements

Functional Requirements	Category	Non-Functional Requirement's	Priority
The system shall allow user to login either as a Student or as an Admin.Admin must need to enter username and password to login.	Evident	The system enter to the nest form. If user enters wrong password or user name system specify the Admin to enter correct information.	Medium
The system shall allow user to select any of above the module that Either Credit Transfer Internal or Credit Transfer External.	Evident	System shall open the module which user is selected.	Low
For **Credit transfer Internal (CTI)**: The system shall allow the student to enter his/her enrollment # and see thecourses which student had registered in previous department.	Evident	System shall show the registered courses in a grid view.	High
For **(CTI):** The system shall allow the user to select the new department.	Hidden	System shall show the courses of that department in a grid view.	High
For **(CTI):** System shall show the courses which can be exempted.And allow the student to exempt the desired courses.	Evident	If there are courses which cannot be exempted the system shall show a message that this course cannot be exempted.	High
The system shall save these courses in a database from where the Admin can retrieve that courses.	Hidden	None	Medium
For **(CTI):** The system shall allow the Admin to retrieve that student course by entering the student's enrollment #.	Evident	Admin should enter the right enrollment#.	High
For **(CTI):** The system should allow the Admin to exempt that courses which were requested by the student.	Evident	If Admin doesn't enter the new enrollment of the student the system show the message to enter the new enrollment.	High
For **(CTI):**The system should allow the Admin to exempt these courses one by one, and save them in a database.	Evident	None	Low

For **(CTI):** Admin should enter the right enrollment# to see the exempted courses and generate a report.	Evident	None	Medium
For **(CTI):** the system should allow the user to see the exempted courses by entering the student enrollment#, and generate a report of the exempted courses to verify from the committee.	Evident	None	Low
For **Credittransfer External (CTE):** The system should allow the student to enter his/her enrollment# and the other details about the courses which he/she wishes to exempt.	Evident	The system should show the courses of concerned department by the help of enrollment number.	Medium
For **(CTE):** The system should save these courses in the database from where the admin can retrieve those requested courses.	Hidden	None	Medium
For **(CTE):** The system shall allow the Admin to retrieve that student's requested course by entering the student's enrollment #.	Evident	The system show the department courses according to the enrollment.	High
For **(CTE):** The system should allow the Admin to import PU and BU course outline files from the system and do the matching comparison between those two files.	Evident	During comparison the system should show the comparison between those two files on a label.	High
For **(CTE):** If matching comparison between thefilesis more than 80% then the system should allow the admin to exempt that course, and save it in a database.	Evident	None	High
For **(CTE):** Admin should enter the right enrollment# to see the exempted courses and generate a report.	Evident	None	Medium
For **(CTE):** The system should allow the Admin to retrieve the exempted courses and generate a report for the committee approval.	Evident	None	High

3.2 Quality Requirements

3.2.1 Availability
The system is a standalone application and will be available when the user will trigger.

3.2.2 Efficiency
System will ensure efficiency by providing fast solution to all modules.

3.2.3 Robustness

System maintains every log on run time so there is no fear of loss of data. System will ensure the robustness until the operating system (Windows) crashes.
3.2.4 Reliability

System will ensure the high level reliability to match two files and handling all the database.

3.2.5 Modifiability (Future updates)

There are many certain things where we can add other features. So with the passage of time we will do that as well.
3.2.6 Legal and licensing

System will be built on Microsoft C#.net platform and will require a regular developer license of the Microsoft developer technologies.
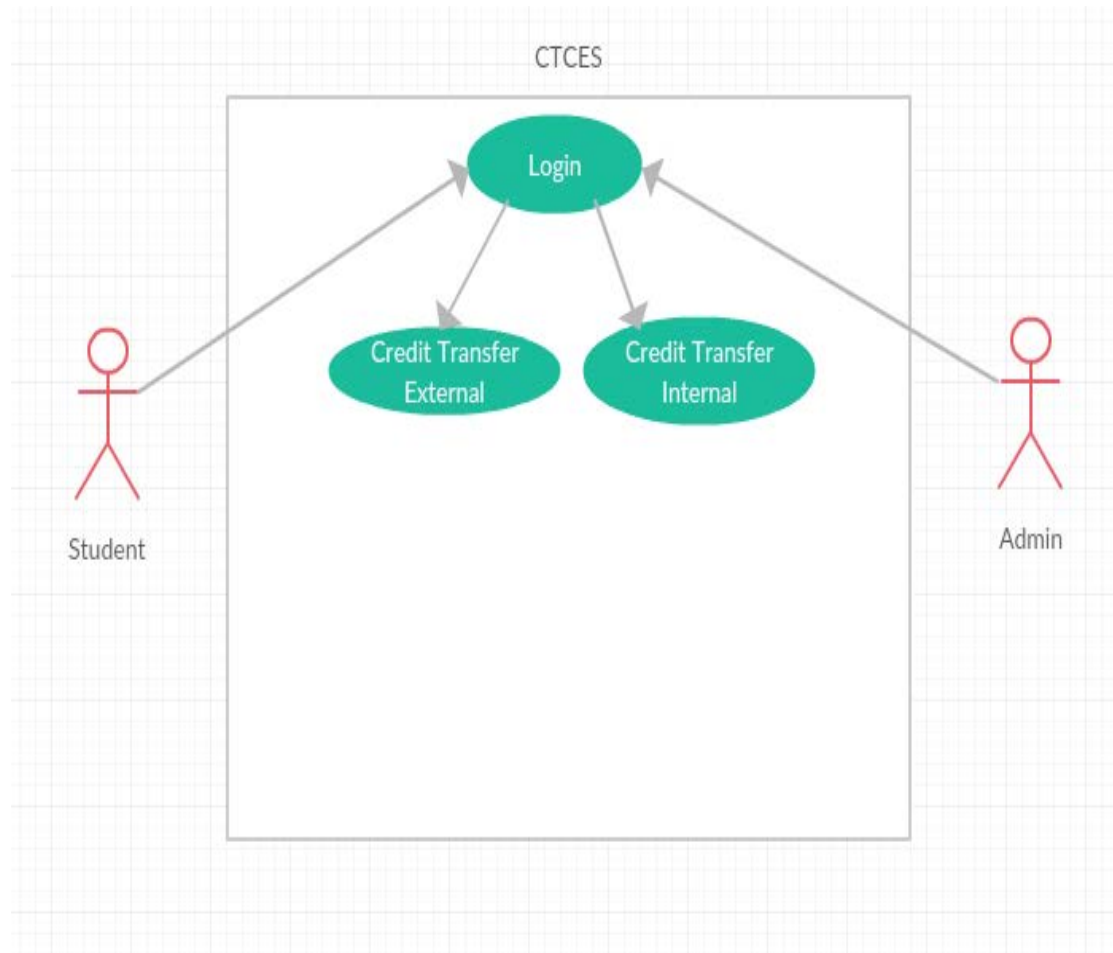
3.3 Use Cases
Use case 3.1

Fig: 3.1

Table 3.1 Detailed description of Use case 2

Use Case ID:	1.0
Use Case Name:	Login Page
Actors:	Student/Admin
Description:	User will Login
Preconditions:	None
Normal Flow:	**1.0.1. Login as a Student** a) Admin will enter his/her Username and password to login b) Student don't need to enter his/her username or password he/she just select from the combo box option as student and login to the app. c) Admin/Student will enter to the next form and select the required module.

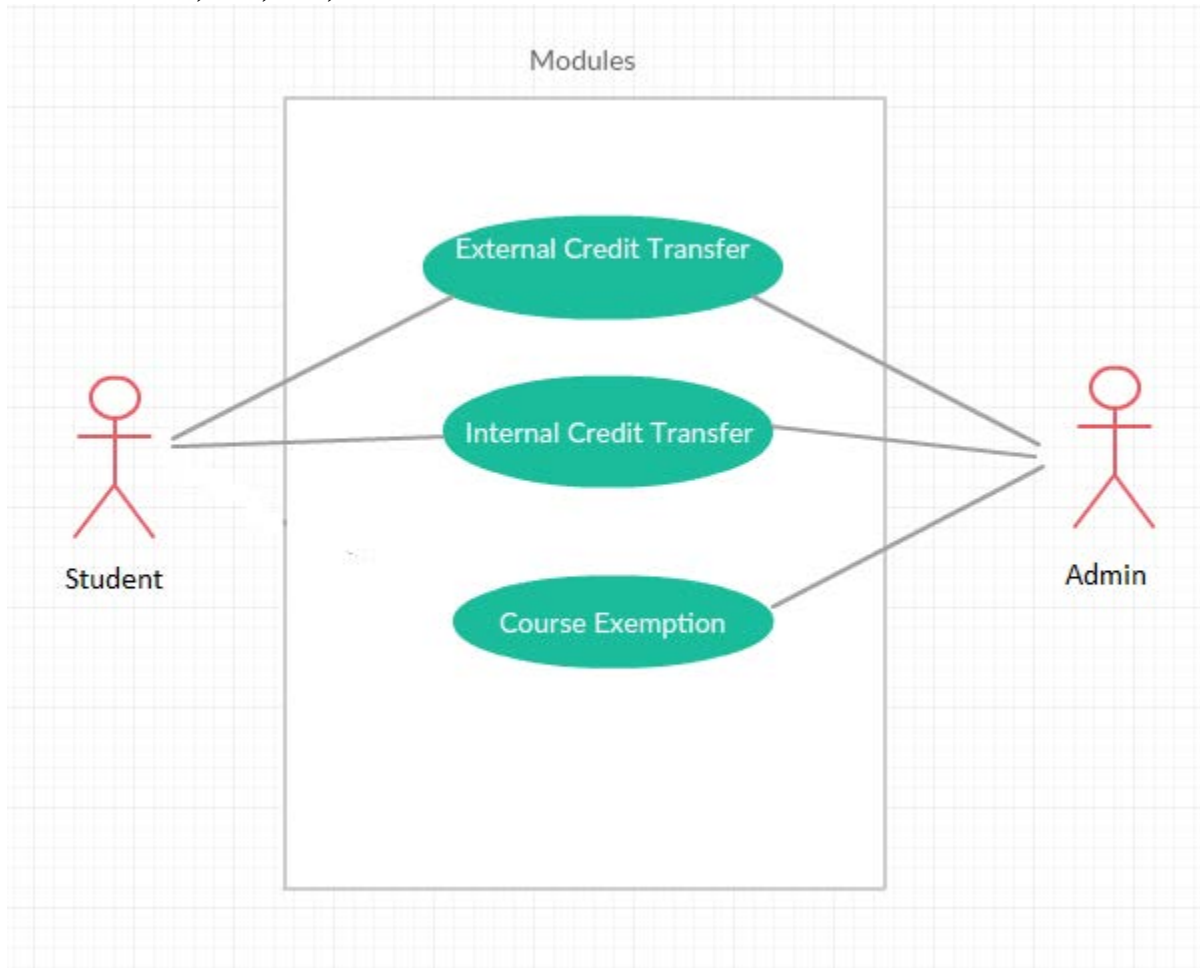|	

Alternative Flow:	**1.0.2 Required field missing**
	    a) If any Field is missing system will show message, '*this field is required' infront of the field(s).
	    b) User will fill the required field(s) and continue.

Exceptions:	**1.0.3 Wrong Input**
	    a) System informs the admin that you enter the wrong username or password.
	    b) System restarts Use Case 1.0.

Priority:	High

Use case 3.2, 3.3, 3.4, and 3.5

Figure 3.2

NOTE:

Fig 3.2 represents the use case flow of application.

Table 3.2 Detailed description of Use case 2

Use Case ID:	2.0
Use Case Name:	Credit Transfer Internal (CTI)
Actors:	Student
Description:	Student will enter in (CTI) module.
Preconditions:	Login as a Student
Normal Flow:	**2.0.1. Login as a Student** d) Student will enter his/her enrollment number. e) The department will show on the label against the student enrollment. f) Student will click on the registered courses button to see his/her courses in that department. g) Student will select the department in a combo box in which he/she wants to transfer his/her courses. h) Student will click the Department button the see the courses of that department. i) Student will click on the Add button to see the courses which are eligible for exemption. j) The courses with the same course code will be appear in the grid view from where the student can add the subjects which he/she wanted to exempted. k) Student click on the add buttons of a grid view to add these courses in a database. l) If a course has F grade in it that it will not be exempt able and system pop up the message that u had F grade in that subject so you cannot exempt this course. m) Student will logout from the app.
Alternative Flow:	**2.0.2 Required field missing** c) If any Field is missing system will show message, '*this field is required' infront of the field(s). d) User will fill the required field(s) and continue.
Exceptions:	**2.0.3 Wrong Input** c) System informs the user that you input the wrong information this field does not exist in the database. d) System restarts Use Case 2.0.
Priority:	High

Table 3.3 Detailed description of Use case 3

Use Case ID:	3.0
Use Case Name:	Credit Transfer Internal (CTI)
Actors:	Admin
Description:	Admin will enter in (CTI) module.
Preconditions:	Login as anAdmin
Normal Flow:	**3.0.1. Login as anAdmin** a) Admin will enter the enrollment number of a student who requested to exempt the courses. b) Admin will the click on the add courses button to see the requested courses. c) The courses will appear in the grid view from where the admin can exempt these courses. d) In order to exempt the courses the admin has to enter the new enrollment of the student. e) On clicking exempt button that course will be exempted and will be saved in a database. f) Admin can retrieve all the exempted courses from the database and generate a report of these courses for the approval of committee.
Alternative Flow:	**3.0.2 Required field missing** a) If any Field is missing system will show message, '*this field is required' infront of the field(s). b) User will fill the required field(s) and continue.
Exceptions:	**3.0.3 Wrong Input** a) System informs the user that you input the wrong information this field does not exist in the database.
Priority:	High

Table 3.4 Detailed description of Use case 4

Use Case ID:	4.0
Use Case	Credit Transfer External (CTE)

Name:	
Actors:	Student
Description:	Student will enter in (CTE) module.
Preconditions:	Login as a Student
Normal Flow:	**4.0.1. Login as a Student** For requesting a course or courses the student has to fill the following fields. 　　a)　Student will enter his/her enrollment number which was provided by the Bahria University. 　　b)　Student will enter the course code (It must be the same as it is in bahria University). 　　c)　Student will enter the Course title (Parent University). 　　d)　Student will select the credit hours of that course (Parent University). 　　e)　Student will upload the course outline file of that corse which he/she student in his/her Parent University. 　　f)　Student will click on the add button to add that course in a database. 　　g)　If the student has to add another course then he/she had to click on add another button to add another course.
Alternative Flow:	**4.0.2 Required field missing** 　　e)　If any Field is missing system will show message, '*this field is required' infront of the field(s). 　　f)　User will fill the required field(s) and continue.
Exceptions:	**4.0.3 Wrong Input** 　　e)　System informs the user that you input the wrong information this field does not exist in the database. 　　f)　System restarts Use Case 2.0.
Priority:	High

Table 3.5 Detailed description of Use case 5

Use Case ID:	5.0
Use Case Name:	Credit Transfer External (CTE)
Actors:	Admin

Description:	Admin will enter in (CTE) module.
Preconditions:	Login as anAdmin
Normal Flow:	**5.0.1. Login as anAdmin** a) Admin will enter the enrollment number of a student who requested to exempt the courses. b) Admin will the click on the Search Courses button to see the requested courses which is eligible to apply and he/she passed that courses in his/her Parent University. c) The courses will appear in the grid view from where the admin can exempt these courses. d) When admin will enter the enrollment number on a label it will appear the name of that department and on clicking that label the admin can access the courses of that department in Bahria University. e) Admin will import the course outline files on their respective test boxes by clicking on that specific cell and both files will be uploaded. f) By clicking on button execute matching comparison both files will be matched and show the result in a label with % sign. g) If the matching comparison is above than 80% then system will allow the admin to exempt that course. h) If the matching comparison is less than 80% than that course will not be exempt able. i) The exempted course will be save in a database. j) Admin can retrieve all the exempted courses from the database and generate a report of these courses for the approval of committee.
Alternative Flow:	**5.0.2 Required field missing** a) If any Field is missing system will show message, '*this field is required' infront of the field(s). b) User will fill the required field(s) and continue.
Exceptions:	**3.0.3 Wrong Input** a) System informs the user that you input the wrong information this field does not exist in the database.

Chapter 4

System Design

4.1 System Overview

This automated system will allow the university administration to exempt internal or external courses of students effectively and efficiently. System will be using some database operations and C# techniques to overcome the problem of course exemption for internal credit hour transfer and external credit hour transfer.

There are two major features of CTCS followed by all the sub-feature of each major

feature.

1- Credit transfer Internal
2- Credit transfer External

4.2- System Architecture

This system will used to manage the External credit hour transfer, internal credit hour transfer and the course exemptions. Keeping the core objective of the system in mind, we needed to design it simple but effective. User will have to select any of the two modules as shown in. (Fig4.1)
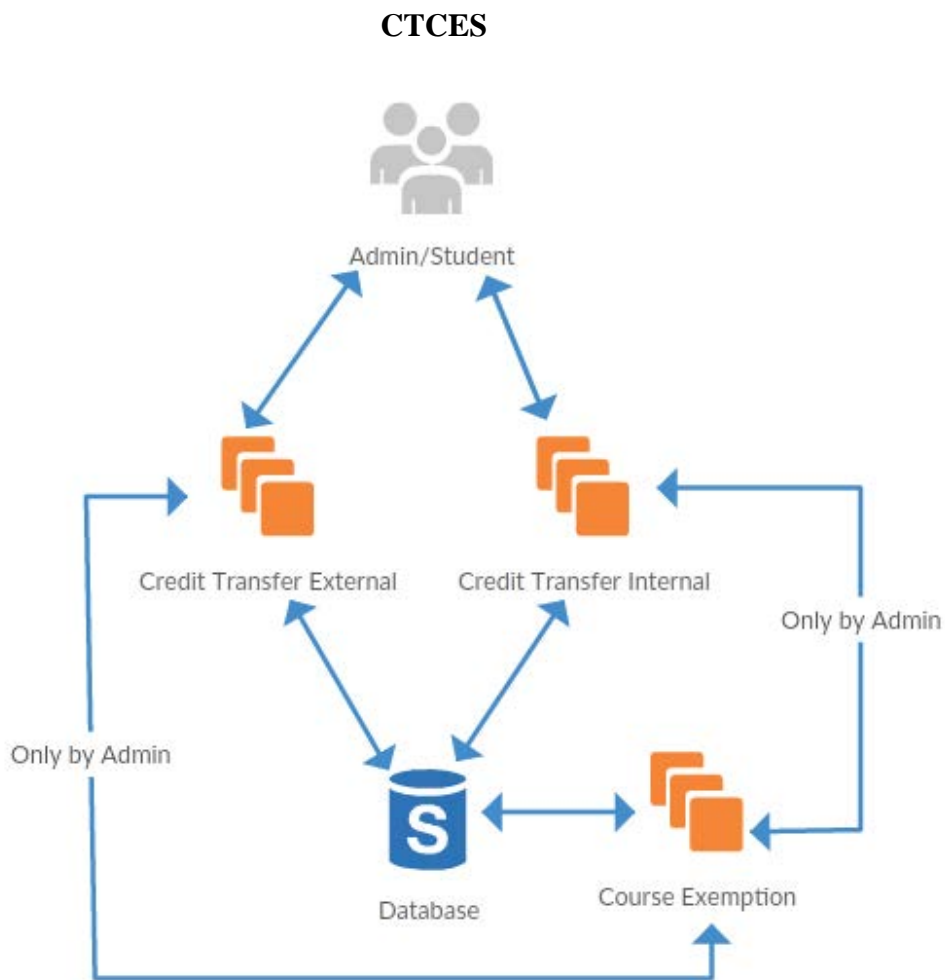
CTCES

Fig: 4.1

4.3- Design constraints

These are the following constraints that we have in this project.

.Net 4.0

.Net 4.0 framework have to be installed on the system.

Student Data

The data of the students from which we can access the other operations.

Course Data

The data of the courses from which we can access the other operations.

SQL Server

Local database will be used in the application.

Third Party API

Third party tool API for the data text mining will be used in the project.

4.4- Design methodology

I will use simple structural approach to design the complete processing of the system which will surely help to explain the core design of the system.

The system will have following procedures For Credit transfer **External**
1 –Add courses (With details)
2 –Matching Experiment
3 – Saving in Database
4 – Access the courses

Design summary

One file will be uploaded by the student and the other one will already be in database., after loading both files on textboxes the system will match those two files, and the further steps will be taken on the result of those comparison if that course can be exempted or not.

The system will have following procedures for Credittransfer **Internal**.
1 – Enter Enrollment

2 – Course code and Grade checking

3- Generating Request

4 – Exemption procedure

5 – New Enrollment

Design summary

Enrollment of the previous department along with the new department enrollment which will be entered by the student through which the system access the student details and courses details and the desired courses will be added against the new enrollment of new department.

4.5- High level design

Process interaction

This part deals with the dynamic aspect of the system. This will explain the processes and their interactivity when the system runs. This part will be capturing the snap short of the running system. We are representing the process interaction using sequence diagram.
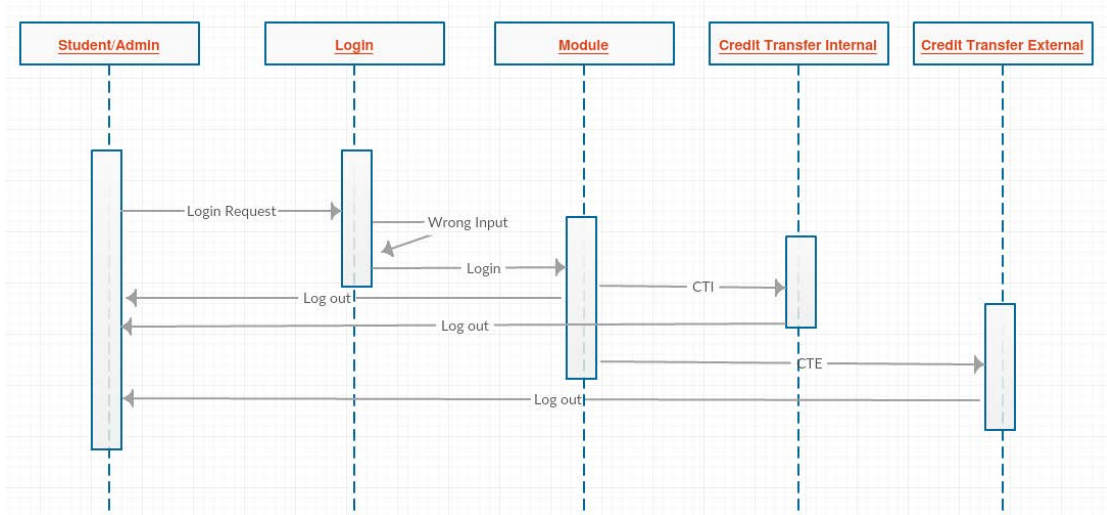
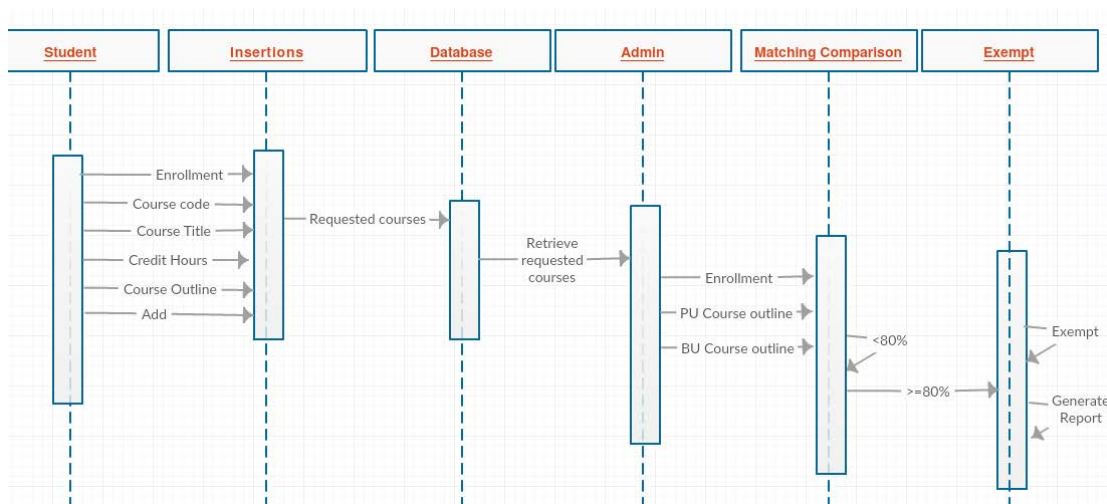**Login Sequence Diagram**

Fig: 4.2

Credit Transfer External
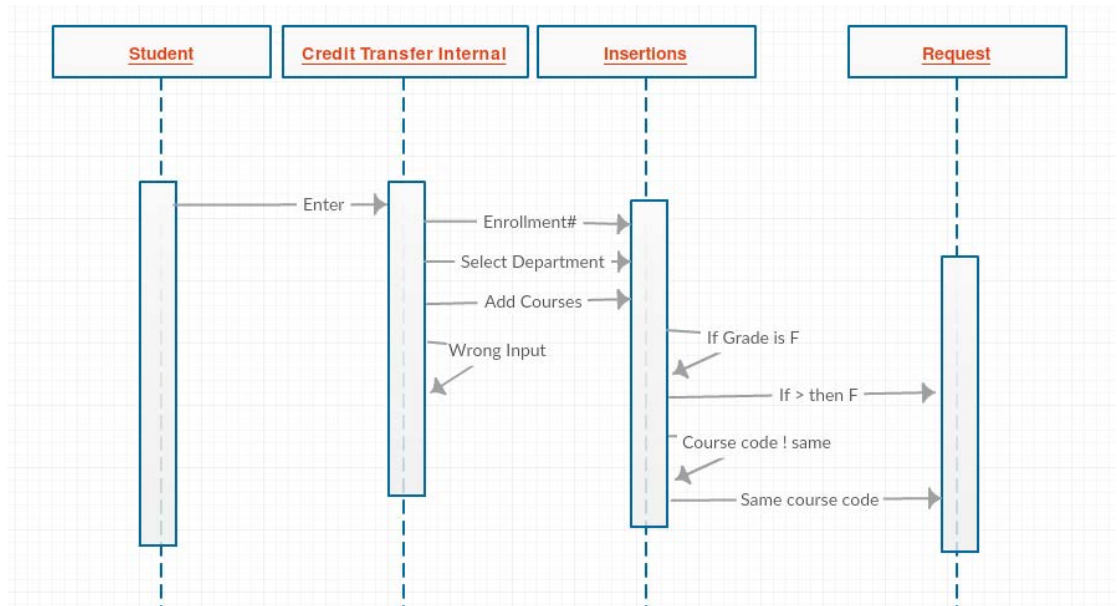

Fig: 4.3
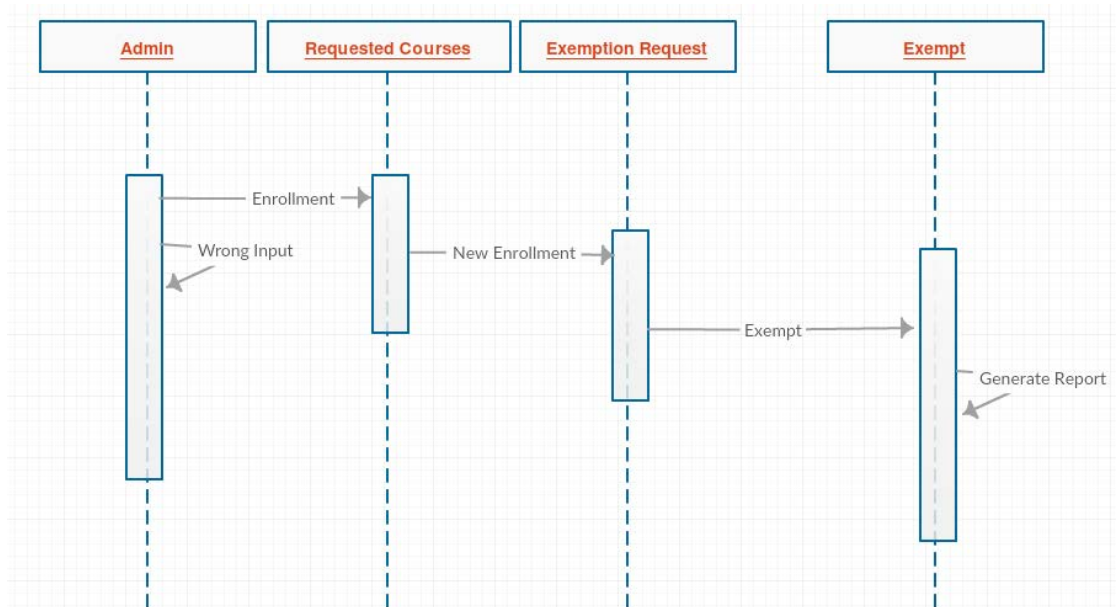
Credit Transfer Internal

Fig: 4.4

Fig: 4.5

4.6- Low level design

This section will explain the low level design of the system. In this part we will split our modules to smaller components and will move towards the reality.
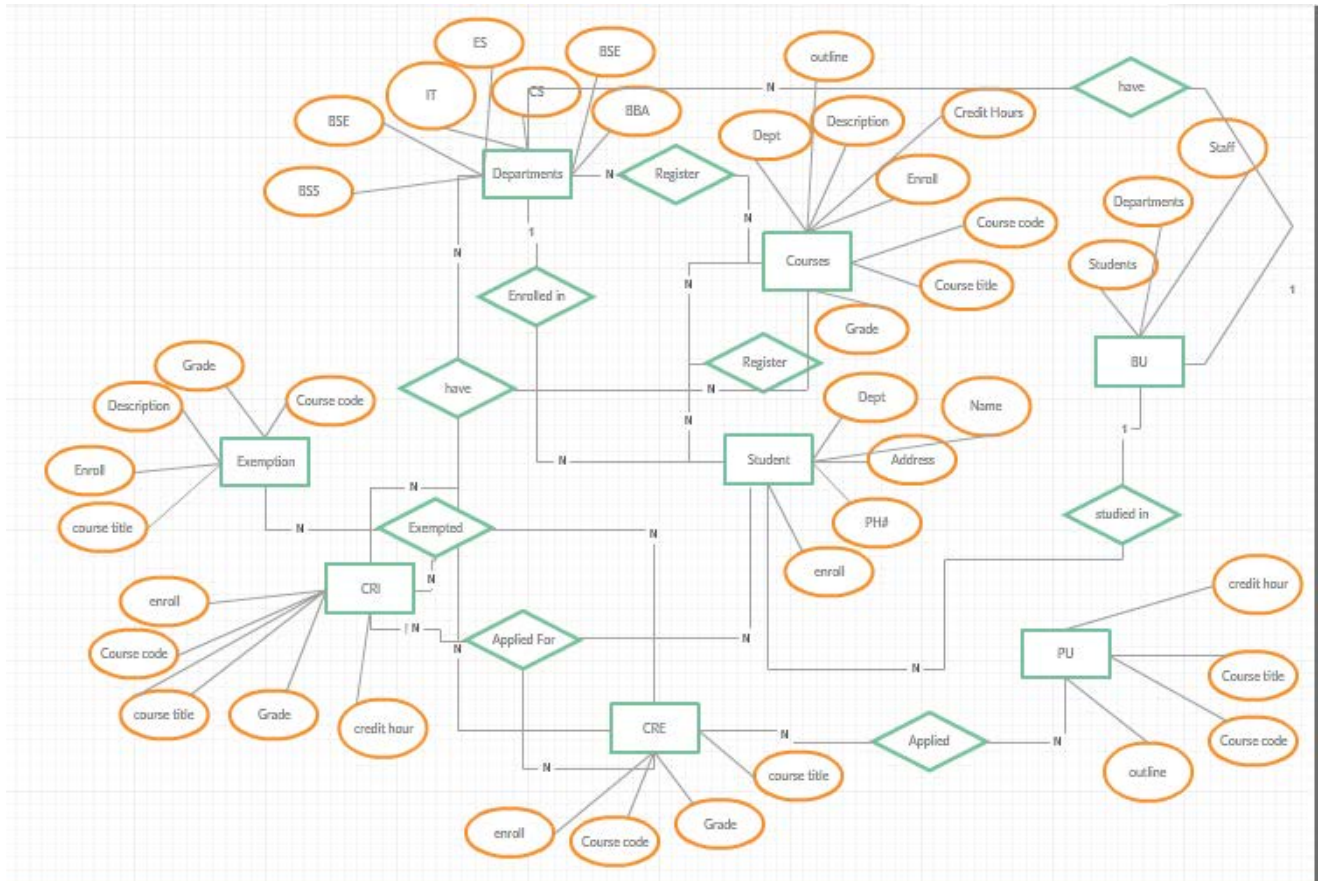
Fig: 4.6

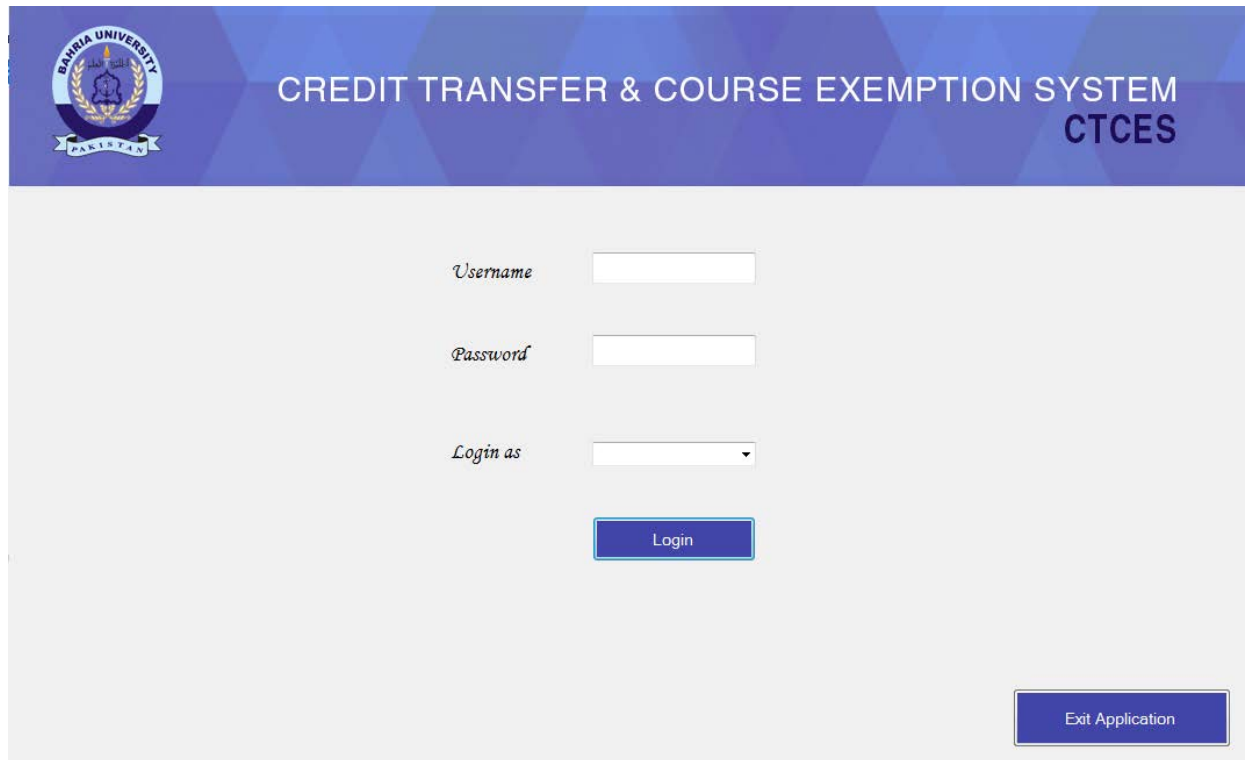## 4.7- Graphical User Interface (GUI) Design

This chapter will explain the graphical user interface of the system.

Graphical user interface contains 7 screens.

One for Main Page and two each for external, internal and course exemption.

GUI is pretty easy to use.

Login Page

Fig: 4.7

User enter as a student or an Admin if the user is Admin than the User name and password is mandatory.

Student_External Form

Fig: 4.8

Adding courses for exemption request.

External_credit Form

Fig: 4.9

Entering enrollment and passing files to text boxes and execute matching comparison.

External_management/internalexemptions Form
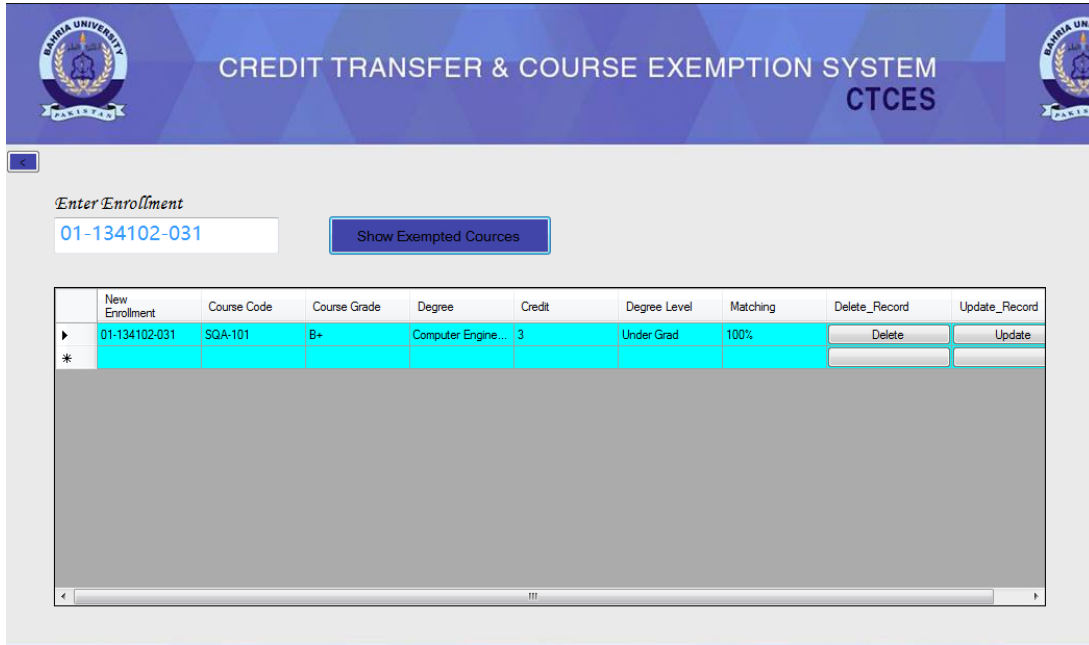
Fig: 4.10

For managing the exempted courses of external credit transfer.
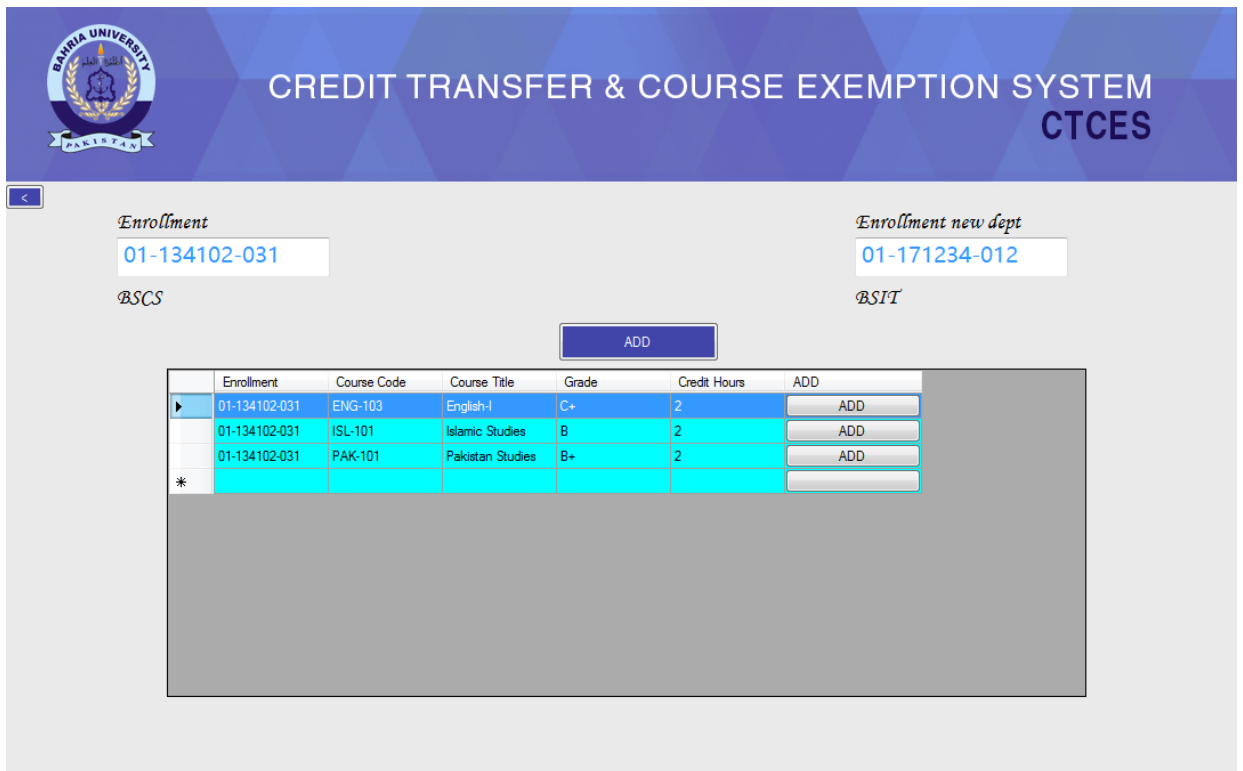**Student_internal Form**

Fig: 4.10

Courses which can be exempted.

Internal_credit form
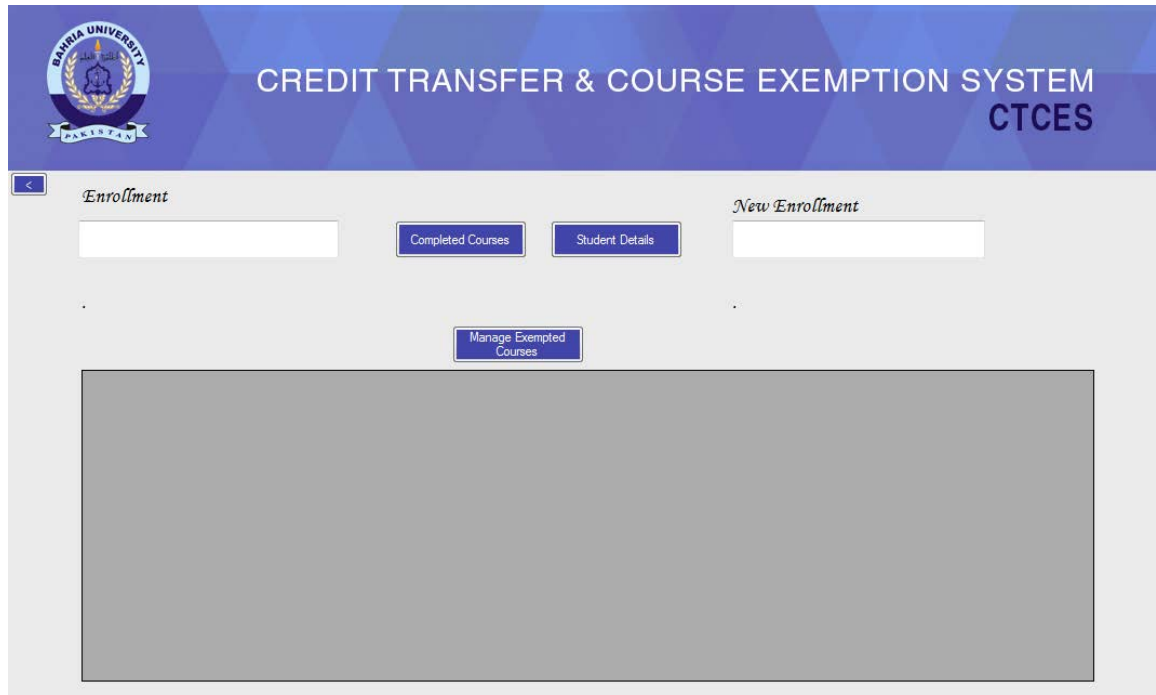
Fig: 4.11

Receive exemptions requests here and handling exemptions.
Student/Admin Form
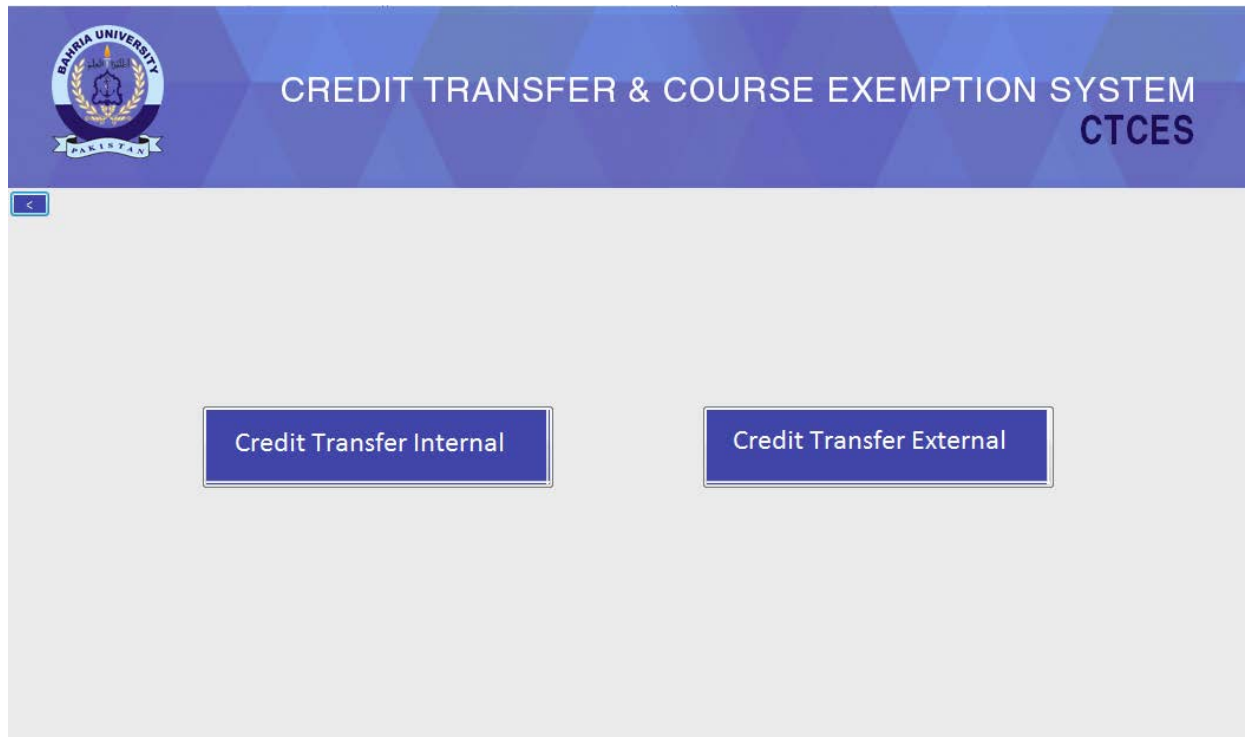
Fig: 4.12

User select the module.

Chapter 5
Implementation

This chapter is divided into following topics.

    5.1-   Development Environment (IDE)

5.1- Development Environment (IDE)

Thispartwillexplaintheintegrateddevelopmentenvironmentonwhichthe   systemis beingdeveloped.

   - **Microsoft Visual Studio IDE.**

1- WewillbeusingtheMicrosoftVisualStudioIDEtodevelopthis particular system.
2- MicrosoftvisualstudioisthemostfamousandwidelyusedIDEforthe windowsbaseddesktopapplicationsandprovideswithagooddeveloper supportviaMSDN.

SettinguptheMSvisualstudioforwindowsapplications

1- DownloadtheMSvisualstudioforC#, ifyouaredevelopingwiththeC# language. I am are using C# language to develop this particular system.
2- Extractthefilesandinstall.
3- Aftertheinstallation, wearereadytosetupvisualstudiotodevelop desktopapplications (Explainedinthesection 5.2).

5.2- Code structure

Whenwecreate thenewprojecttheIDEautomaticallyorganizethecodefiles.
Todothis, weneedtogoto
File > project.
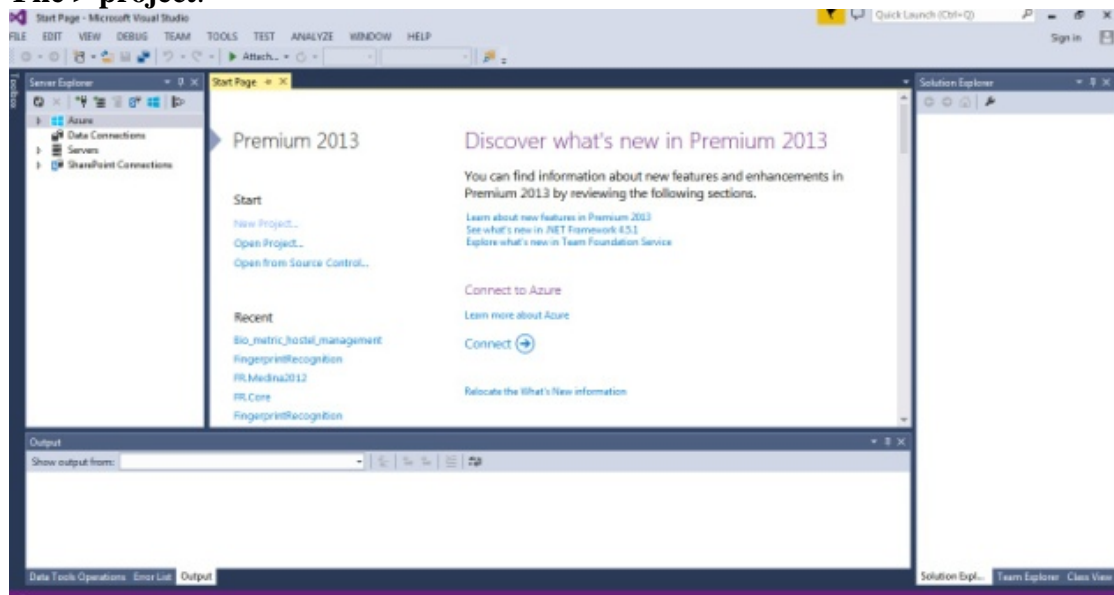
Fig: 5.1

File > project > Visual C#>Windows forms application
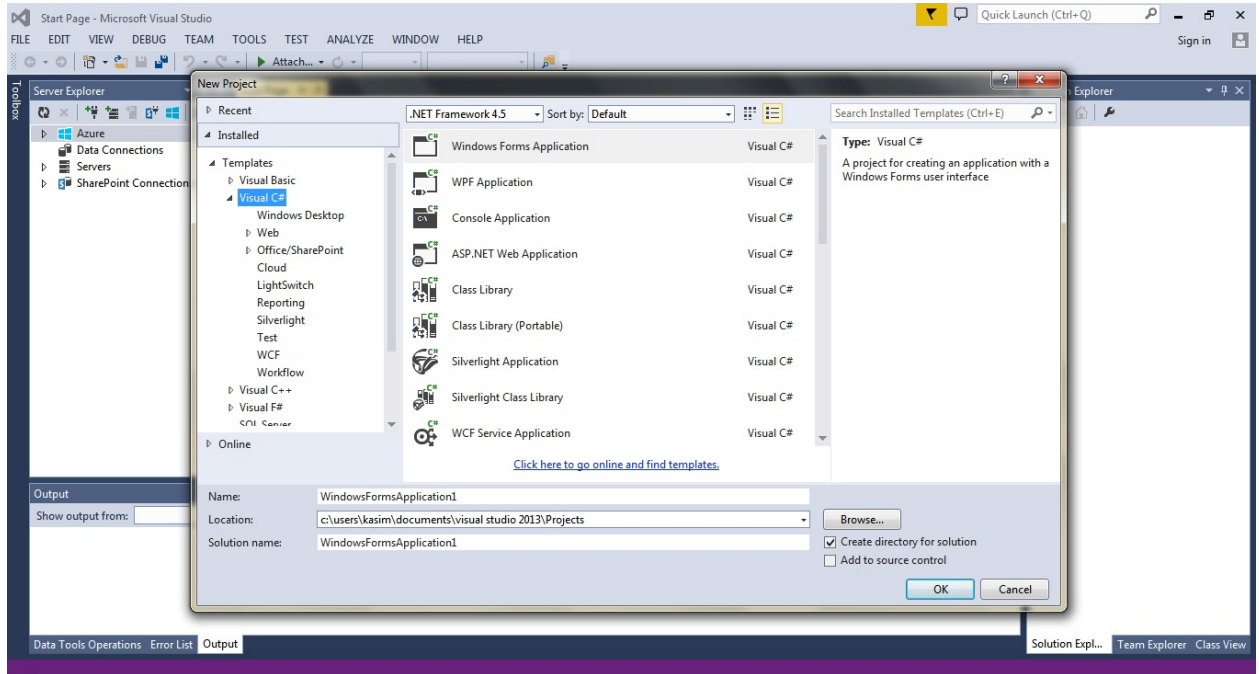
Fig: 5.2

File > project > Visual C# > Project
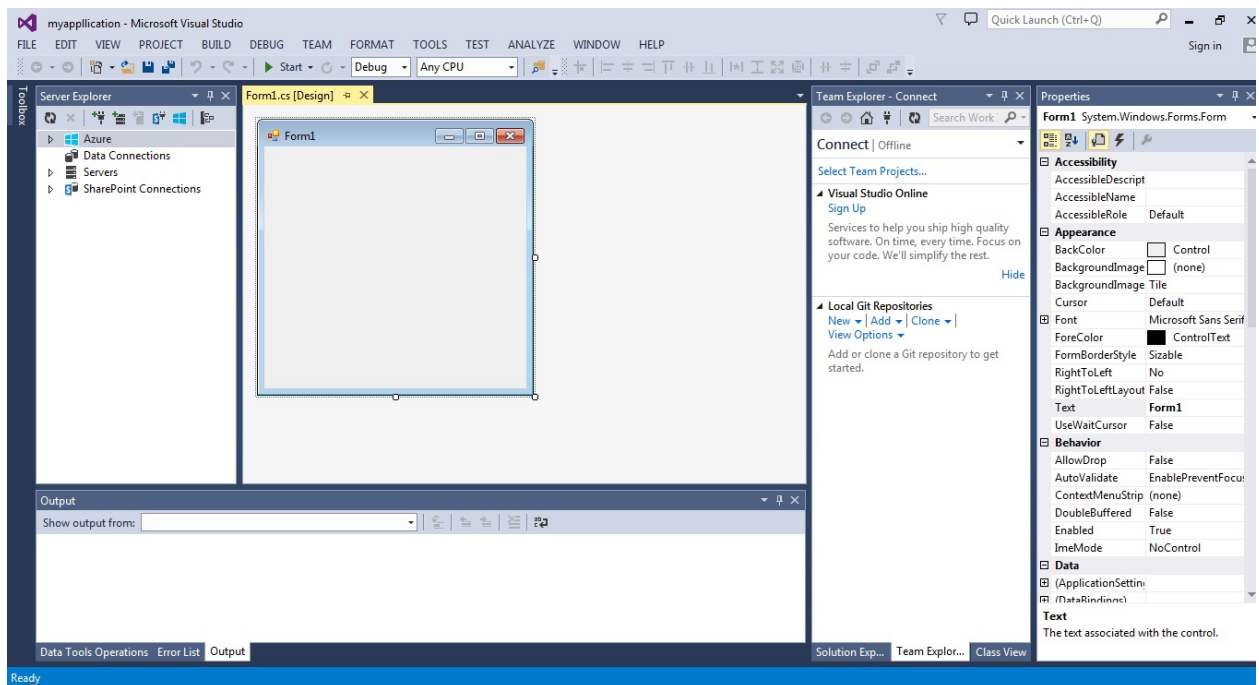
Fig: 5.3

File> Project > Visual C#> Project > Solution Explorer
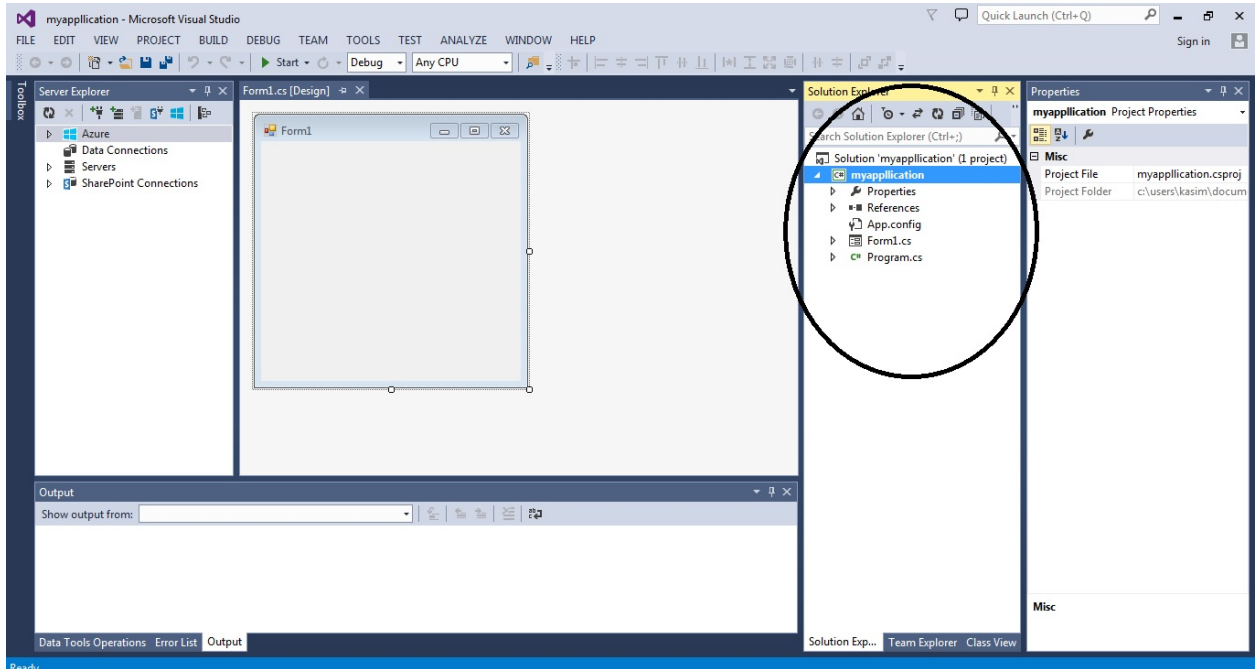
Fig: 5.4

Code files

WhenwecreateadesktopapplicationprojectinMSVisualStudio,itorganizes allthefilesintheappropriatedirectories.
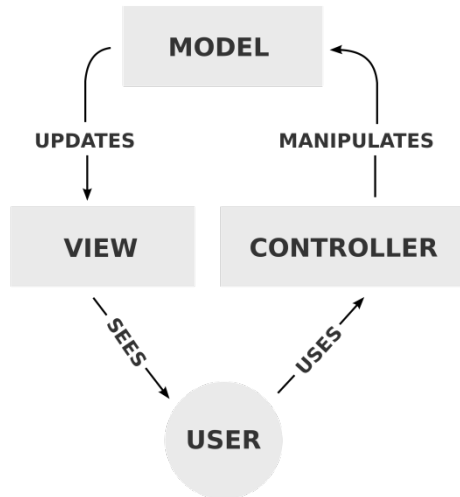
Fig: 5.5

Visual Studio contains all the necessary directories as shown in the snap shot of the IDE project files.

There is a three tier architecture which is being used to develop this particular system.

1- View

GenerallycontainsSQLfileswhichrunsonclientside(on application)to giveapresentationofthedatatotheuser.

2- Model

Modelcontainsallthenecessaryprocessingofthesystemfrombothuser andtheserverend.

3- Controller

Controllercontrolsalltheinputsanddirectsthesystemflowtothe appropriateaction (Processing).

5.3 – Methods/ Algorithm Flow

In the section we will talk about the methods flow of the system.
Matching Algorithm

Upload both the files source and external and the system will read those files to end of their point.
The matching between the two files is about the words not characters so I use .split function which read the files as words and not as characters.

```
string[]str1 = text.Split(newstring[]{},StringSplitOptions.RemoveEmptyEntries);
```

1st loop:
1st loop which is outer loop, it is for the source file and will terminates until the length of words are greater than the counter (i).

2ndloop:
2nd loop which is inner loop, it is for the external file and will terminates until the length of words are greater than the counter (j).

Inside this loop there will be a matching experiment if (`str1[i] == str2[j]`) here all the words of source file will be matched with words of external file and in the (count) variable the system will have the total number of matching words.

If count has the value less than the source file length value then the percentage formula will be applied which will be stored in a variable and the result will be shown.

Chapter-6
System Testing and Evaluation

This chapter contains test-cases based on functionality and interactivity of the system.
We tested our system using white box, gray box and black box testing techniques.

6.1- System Load Test

Test Case ID		6.1	
Description		Tests the app the system loads well or not on startup.	
Applicable for		Windows Operating System	
Requirements			
Step	Full / Regr	Task & Expected Result	
1			
2		System loads successfully	**Pass**

6.2- GUI and use-ability testing

6.2.1- Login

Test Case ID		6.2.1	
Description		Test the login Form.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_01	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify the login screen has been displayed on the Computer Application successfully.	**Pass**
3		Enter User name and password	**Pass**

6.2.1-Credit Transfer ExternalButton Test

Test Case ID	6.2.1	
Description	Tests the ExternalCredit Transfer on click buttonfunctionality.	
Applicable for	Windows OS	
Requirements	REQ_FUNQ_01	
Step	**Full / Regr**	**Task & Expected Result**	
1			
2		Verify that, on clicking button it is moving to the next form External_credit.	**Pass**

6.2.2- Internal Credit Transfer Button Test

Test Case ID	6.2.2	
Description	Tests the InternalCredit Transfer on click buttonfunctionality.	
Applicable for	Windows OS	
Requirements	REQ_FUNQ_01	
Step	**Full / Regr**	**Task & Expected Result**	
1			
2		Verify that, on clicking button it is moving to the next form Internal_credit.	**Pass**

6.2.3- Exit Application Button Test

Test Case ID	6.2.3	
Description	Tests the Exit Application on click buttonfunctionality.	
Applicable for	Windows OS	
Requirements		
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the application is closed.	**Pass**

6.2.4- Registered Courses Button Test

Test Case ID	6.2.4	
Description	Tests the Registered courses on click buttonfunctionality.	
Applicable for	Windows Operating System	
Requirements	REQ_FUNQ_02	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button system is loading data of the courses from database.	**Pass**

6.2.5- Department Button Test

Test Case ID	6.2.5	
Description	Tests the Department on click buttonfunctionality.	
Applicable for	Windows Operating System	
Requirements	REQ_FUNQ_02	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is loading the courses of that department which is selected in combo box.	**Pass**

6.2.6- Add Button Test

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Test Case ID		6.2.6	
Description		Tests the Add on click buttonfunctionality. (used in CRI)	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_02	
Step	**Full / Regr**	**Task & Expected Result**	
1			
2		Verify that, on clicking button the system is loading the courses that are having the same course code of registered courses and department.	**Pass**

6.2.7- Requested courses Test

Test Case ID		6.2.7	
Description		Tests the Requested courses on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_03	
Step	**Full / Regr**	**Task & Expected Result**	
1			
2		Verify that, on clicking button the system is loading the courses which student added to the database.	**Pass**

6.2.8- Exempted courses button Test

Test Case ID		6.2.8	
Description		Tests the Exempted courses on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_03 , REQ_FUNQ_05	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is showing the exempted courses.	**Pass**

6.2.9- Print Button Test

Test Case ID		6.2.9	
Description		Tests the Print on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_03	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is generating a report of exempted courses..	**Pass**

6.2.10- Add button Test

Test Case ID		6.2.10	
Description		Tests the Add on click buttonfunctionality. (used in CRE).	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_04	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is saving a course of parent university in database.	**Pass**

6.2.11- Browse Button Test

Test Case ID		6.2.11	
Description		Tests the Browse on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_04	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking this button the system is uploading a course outline file.	**Pass**

6.2.12- Search button Test

Test Case ID		6.2.12	
Description		Tests the search on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_05	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is loading the requested courses which is made by a student.	**Pass**

6.2.13- Execute Matching Comparison Button Test

Test Case ID		6.2.13	
Description		Tests the ExecuteMatchingExperiment on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements			
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button it is showing the percentage on a label.	**Pass**

6.2.14- Request Exemption Button Test

Test Case ID		6.2.14	
Description		Tests the Request Exemption on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_05	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is exempting that course.	**Pass**

6.2.15- Watch Student Details Button Test

Test Case ID		6.2.15	
Description		Tests the Watch StudentDetails on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUCQ_03	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button it is showing the details of a student in the above gridview.	**Pass**

6.2.16- On clicking label Test

Test Case ID		6.2.15	
Description		Tests the on clickinf label functionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUCQ_02, REQ_FUCQ_04, REQ_FUCQ_05	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking label the system is showing the courses of that department	**Pass**

6.3- Functionality testing

6.3.1- Percentage Test

Test Case ID		6.3.1	
Description		Tests the Label Backendload test Functionality.	
Applicable for		Windows Operating System	
Requirements		3.3.2.1	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking Execute Matching button it is showing the Percentage on that label.	**Pass**

6.2.7- Add grid view Test

Test Case ID		6.2.7	
Description		Tests the ADD dridview on click buttonfunctionality. (used in CRI)	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_02	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is adding a course to the database from where the admin can retrieve these courses.	**Pass**

6.2.7- Exempt Button Test

Test Case ID		6.2.7	
Description		Tests the Eempt on click buttonfunctionality.	
Applicable for		Windows Operating System	
Requirements		REQ_FUNQ_02	
Step	Full / Regr	Task & Expected Result	
1			
2		Verify that, on clicking button the system is exempting a course against the new enrollment.	**Pass**

Chapter 7
Conclusion

The main objective of the project is to provide an automated, very effective and user friendly solution to the users. All the requirements given by the users are implemented and tested. The system is working successfully.

The main two users admin and students are provide with their own GUIs, which is very easy to use.

This is a desktop application. In future it can be made web-enabled and further it can be used as a part of Bahria University Management System.

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