

# **VIRTUAL CLASSROOM**

**A PROJECT REPORT**

*Submitted by*

**Sanket Somani (110410107013)**

**&**

**Ayush Ruchandani (110410107047)**

*In fulfillment for the award of the degree*

*of*

**BACHELOR OF ENGINEERING**

*in*

**Computer Engineering**



**Sardar Vallabhbhai Patel Institute of Technology, Vasad**

**Gujarat Technological University, Ahmedabad**

**MAY 2015**

**Sardar Vallabhbhai Patel Institute Of Technology, Vasad**

**Computer Engineering Department**

2015



**CERTIFICATE**

**Date:**

This is to certify that the project entitled “VIRTUAL CLASSROOM” has been carried out by Sanket Somani (En. Number-110410107013) and Ayush Ruchandani (En. Number-110410107047) under my guidance in fulfillment of the degree of Bachelor of Engineering in Computer Engineering (8<sup>th</sup> Semester) of Gujarat Technological University, Ahmedabad during the academic year 2014-2015.

**Guides:**

Ms. Rimi Gupta  
Assistant Professor  
C.E. Department  
SVIT-Vasad

Ms. Bijal Talati  
HOD  
C.E. Department  
SVIT-Vasad



Date: 27<sup>th</sup> April, 2015

### UTILITY CERTIFICATE

This is to certify that (1) Sanket Somani (2) Ayush Ruchandani students of B.E (Computer Engineering) from SVIT, Vasad have successfully completed their assigned project "**VIRTUAL CLASSROOM**" under our supervision. This project is fully utilized by students for the purpose of Blended Learning for their existing institutes and academy.

The duration of project work was from June 2014 to May 2015. They were found sincere, committed, hardworking and progressive in entire project work duration. We as M/s Wipro Infotech Pvt Ltd wish them all success in their education & career.

Place: Vadodara

Mr. Urmil Bakhai

Regional Manager



Wipro Infotech, (A Division of Wipro Limited) 807-808, Venus Atlantis, Opp. Safal Pegasus, 100 Ft. Ring Road, Prahladnagar,  
Ahmedabad, Gujarat-380 015. Tel : +91-079-40300050, 51 Fax : +91-079-40300048  
Regd. Office : Wipro Limited, Doudkanelli, Sarjapur Road, Bangalore - 560 035, India Tel. : +91-80-28440011, Fax : +91-80-28440212/214 Web : www.wipro.com

## **UNDERTAKING ABOUT ORIGINALITY OF WORK**

We hereby certify that we are the sole authors of this IDP project report and that neither any part of this IDP project report nor the whole of the IDP Project report has been submitted for a degree by other students to any other University or Institution.

We certify that, to the best of our knowledge, the current IDP Project report does not infringe upon anyone's copyright nor violate any proprietary rights and that any ideas, techniques, quotations or any other material from the work of other people included in our IDP Project report, published or otherwise, are fully acknowledged in accordance with the standard referencing practices. Furthermore, to the extent that we have included copyrighted material that surpasses the boundary of fair dealing within the meaning of the Indian Copyright (Amendment) Act 2012, we certify that we have obtained a written permission from the copyright owners to include such materials in the current IDP Project report and have included copies of such copyright clearances to our appendix.

We have checked the write up of the present IDP Project report using anti-plagiarism database and it is in the allowable limit. In case of any complaints pertaining to plagiarism, we certify that we shall be solely responsible for the same and we understand that as per norms, University can even revoke BE degree conferred upon the students submitting this IDP Project report, in case it is found to be plagiarized.

TEAM:

Enrollment Number	Name	Sign
110410107013	Somani Sanket Jayeshbhai	
110410107047	Ruchandani Ayush Parshotam	

Place: Vadodara

Date: \_\_\_\_\_

Name of Guide: Ms. Rimi Gupta

Sign: \_\_\_\_\_

## **ACNOWLEDGEMENT**

It gives us immense pleasure and satisfaction in presenting this report of the Project undertaken during the Final Year of B.E. As it is the first step into our Professional Life, we would like to take this opportunity to express our sincere thanks to several people, without whose help and encouragement, it would have been impossible for us to carry out the desired work.

We would like to express our sincere thanks to our **Head of Department Prof. Bijal Talati** from the bottom of our heart, who gave us an opportunity to undertake such a great challenging and innovative work. We are grateful to them for her guidance, encouragement, understanding and insightful support in the development process.

We are thankful to **Assistant Prof. Rimi Gupta, Computer Department** for guiding us in our project and sharing her valuable knowledge with us. They have been a constant source of motivation for us. By their uncompromising demand for quality and their insistence for meeting the deadlines, we could do such an excellent work.

Finally, we thank our college **SVIT** (Sardar Vallabhbhai Patel Institute of Technology) **family** for providing us supporting environment. We thank them for providing us such a warm atmosphere to make our project development experience delightful and memorable.

My special thanks to **GUJARAT TECHNOLOGY UNIVERSITY** whose continuous encouragement, suggestions and constructive have been invaluable assets throughout our report analysis.

## **ABSTRACT**

*Virtual Classroom can be used by the existing educational institutes that exist in reality as well as companies who will to provide training to their employees via Internet. This will make their way of learning more strong and interesting and it will make many of the tasks such as examinations and assignment posting through fully automated system. Along with that it makes easy for Administrator to manage details about the student as well as teacher from a single application.*

*This also utilizes more advanced techniques like video learning where a teacher can communicate to multiple numbers of students at a time just like a web-conference. It will also focus on query solving using personal message that bridges the gap between student and teacher out of the class and provides more flexibility to student to discuss the particular question by his/her convenience.*

*Virtual Classroom provides means of enhanced learning in various fields. It also provides ways in which a student can improve his/her learning. A student can also appear for test to improve his knowledge in the course.*

## **LIST OF TABLES**

<b><u>Table. No.</u></b>	<b><u>Table</u></b>	<b><u>Page No</u></b>
1. Risk Analysis.....		18
2. Student Sign_Up Table.....		48
3. Teacher Sign_Up Table.....		49
4. Admin Login Table.....		51
5. Offline Content Table.....		51
6. Query Table.....		52
7. Test Generation Table.....		53
8. Test Question Table.....		53
9. Check Test Given Table.....		54
10. Take Virtual Class Table.....		55
11. Test Cases for Login and Logout.....		91
12. Test Cases for Registration.....		92
13. Test Cases for Content Module.....		94
14. Test Cases for Online Class Module.....		95
15. Test Cases for Course Change.....		96
16. Test Cases for Query Module.....		97
17. Test Cases for Test Generation.....		98
18. Test Cases for Report Viewing and Test Appearance.....		99

## **LIST OF FIGURES**

<b><u>Figure No.</u></b>	<b><u>FIGURES</u></b>	<b><u>Page No.</u></b>
1.1	Wipro Logo.....	1
1.2	Incremental Life-Cycle Model.....	14
1.3	Gantt/ Timeline Chart.....	16
1.4	.NET Framework.....	21
1.5	CLR.....	22
1.6	Framework Class Library.....	24
2.1	Class Diagram for Virtual Classroom.....	28
2.2	System Use-case Diagram.....	30
2.3	Registration Use-case Diagram.....	31
2.4	Offline Lecture Management Use-case Diagram.....	31
2.5	Video Lecture Use-case Diagram.....	32
2.6	Personal Message Use-case Diagram.....	32
2.7	Evaluation Use-case Diagram.....	33
2.8	Admin Sequence Diagram.....	35
2.9	Student Sequence Diagram.....	36
2.10	Teacher Sequence Diagram.....	37
2.11	Student State Diagram.....	39
2.12	Teacher State Diagram.....	40
2.13	Admin State Diagram.....	41
2.14	Student Activity Diagram.....	43
2.15	Teacher Activity Diagram.....	44
2.16	Admin Activity Diagram.....	45
2.17	E-R Diagram for Virtual Classroom.....	47
2.18	Ideation Canvas.....	56

2.19	Observation Matrix.....	57
2.20	Phase Implementation.....	58
3.1	Home Page.....	60
3.2	Student Registration Page(1).....	61
3.3	Student Registration Page(2).....	61
3.4	Teacher Registration Page(1).....	62
3.5	Teacher Registration Page(2).....	62
3.6	Courses Available Page.....	63
3.7	Teacher Home Page after Login.....	63
3.8	Student Home Page after Login.....	64
3.9	Admin Login Page.....	64
3.10	Admin Home Page after Login.....	65
3.11	View and Approve Teachers at Admin Side.....	65
3.12	Edit Teacher Details at Admin Side.....	66
3.13	Registered Students Page at Admin Side.....	66
3.14	Email Received to Teacher after Approval.....	67
3.15	Content Upload Page at Teacher Side.....	68
3.16	Content Approval Page at Admin Side.....	68
3.17	Content Description Page at Teacher Side.....	69
3.18	Uploaded Content Page at Admin Side.....	69
3.19	View & Download Content Page at Student Side....	70
3.20	Query Posting Page at Student Side.....	71
3.21	View Posted Query Page at Teacher Side.....	71
3.22	Query Reply Page at Teacher Side.....	72
3.23	View Posted Query Page at Student Side.....	72
3.24	View Reply Page at Student Side.....	73

3.25 Ask for Online Class Page at Teacher Side.....	74
3.26 Online Class Approval Page at Admin Side.....	74
3.27 Online Class Specification Page at Admin Side.....	75
3.28 Registered Online Class Page at Admin Side.....	75
3.29 Teacher Side Online Class Console Application.....	76
3.30 No Class Error Page at Student Side.....	76
3.31 Email Received to the Student about Online Class Schedule.....	77
3.32 Email Received to Teacher after Online Class Approval.....	77
3.33 Online Class Page at Student Side.....	78
3.34 Virtual Class at Student Side.....	78
3.35 Test Generation Page at Teacher Side.....	79
3.36 Add Question Page at Teacher Side.....	79
3.37 View Test Page at Student Side.....	80
3.38 Test Instruction Page at Student Side.....	80
3.39 Test Dashboard at Student Side.....	81
3.40 Test Result Page at Student Side.....	81
3.41 View Report Page at Student Side.....	82
3.42 Student Test Report.....	83
3.43 Student Course Report.....	84
3.44 Edit Student Profile.....	85
3.45 Edit Teacher Profile.....	85
3.46 Change Course Error Page.....	86
3.47 Change Course Page at Teacher Side.....	86

## **TABLE OF CONTENTS**

<b>Acknowledgement.....</b>	<b>XIV</b>
<b>Abstract.....</b>	<b>XV</b>
<b>List of Tables.....</b>	<b>XVI</b>
<b>List of Figures.....</b>	<b>XVII</b>
<b>Chapters:</b>	
<b>1 Introduction.....</b>	<b>1</b>
1.1 Company Profile.....	1
1.1.1 Brief History.....	1
1.1.2 Company Details.....	2
1.1.3 Company Objectives.....	2
1.2 Introduction to Project.....	3
1.2.1 Purpose.....	3
1.2.2 Background.....	3
1.2.3 Definition.....	4
1.2.4 Scope of the System.....	4
1.3 Feasibility Study.....	5
1.3.1 Operational Feasibility.....	5
1.3.2 Economic Feasibility.....	6
1.3.3 Technical Feasibility.....	7
1.3.4 Schedule Feasibility.....	7
1.4 Problem Specification.....	8
1.4.1 Software Requirement Engineering.....	8
1.4.2 Requirement Specification.....	8
1.4.2.1 Functional Requirements.....	8

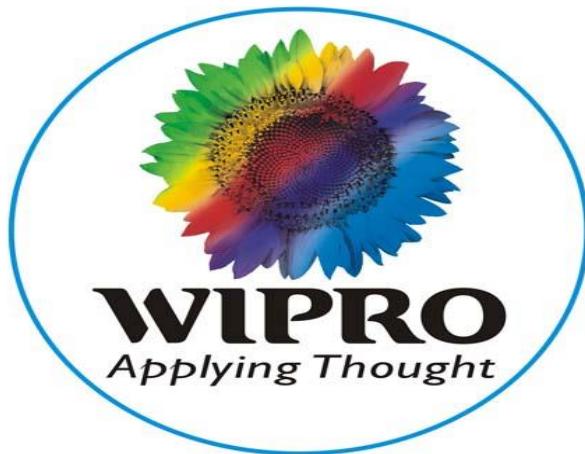
1.4.2.2	Non-Functional Requirements.....	10
1.4.2.3	Constraints.....	12
1.5	Software Development Model.....	13
1.5.1	Incremental Model.....	13
1.5.2	Justification.....	14
1.6	Project Plan.....	15
1.6.1	Project Schedule.....	15
1.6.2	Risk Management.....	17
1.7	Coding Standards and Tools.....	19
1.7.1	Introduction to .NET.....	19
1.7.2	Why .NET?.....	19
1.7.3	Overview of .NET.....	20
1.7.4	Tools and Technologies Used.....	25
<b>2</b>	<b>System Design.....</b>	<b>26</b>
2.1	Design Principles .....	26
2.2	Class Diagram.....	26
2.3	Use-Case Diagram.....	29
2.4	Sequence Diagram.....	34
2.5	State Diagram.....	38
2.6	Activity Diagram.....	42
2.7	ER Diagram.....	46
2.8	Data Dictionary.....	48
2.9	Canvas.....	56
2.9.1	Ideation Canvas.....	56
2.9.2	Observation Matrix.....	57
2.10	Implementation Environment.....	58

2.10.1	Advantages.....	59
<b>3</b>	<b>System Implementation.....</b>	<b>60</b>
3.1	Screenshots.....	60
3.1.1	Home and Registration Screenshots.....	60
3.1.2	Content Management Module Screenshots.....	68
3.1.3	Doubt Solving Module Screenshots.....	71
3.1.4	Online Class Module Screenshots.....	74
3.1.5	Assessment Module Screenshots.....	79
3.1.6	Edit Profile and Change Course Screenshots.....	85
3.2	Testing.....	87
3.2.1	Testing Plan.....	87
3.2.2	Testing Strategy.....	87
3.2.3	Testing Methods.....	88
3.3	Test Cases.....	91
<b>4</b>	<b>Results and Conclusion.....</b>	<b>101</b>
4.1	Limitations.....	101
4.2	Future Enhancement.....	101
4.3	Conclusion.....	102
<b>Bibliography.....</b>		<b>103</b>
<b>Appendix.....</b>		<b>104</b>

**INTRODUCTION****Chapter – 1****1.1 COMPANY PROFILE****1.1.1 BREIF HISTORY**

The company was incorporated on 29 December 1945, in Mumbai by Mohamed Premji as 'Western India Vegetable Products Limited', later abbreviated to 'Wipro'. It was initially set up as a manufacturer of vegetable and refined oils in Amalner, district Jalgaon, Maharashtra, under the trade names of Kisan, Sunflower and Camel. The company logo still contains a sunflower to reflect products of the original business.<sup>[10]</sup>

In 1994, Wipro set up an overseas design centre, Odyssey 21, for undertaking projects and product developments in advanced technologies for overseas clients. Wipro Infotech and Wipro Systems were amalgamated with Wipro in April that year.<sup>[1]</sup> Five of Wipro's manufacturing and development facilities secured the ISO 9001 certification during 1994–95. In 1999, Wipro acquired Wipro Acer. Wipro became a more profitable, diversified corporation with new products such as the Wipro SuperGenius personal computers (PCs). In 1999, the product was the one Indian PC range to obtain US-based National Software Testing Laboratory (NSTL) certification for the Year 2000 (Y2K) compliance in hardware for all models.<sup>[10]</sup>



*Figure 1.1- Wipro Logo*

### **1.1.2 COMPANY DETAILS**

Wipro Limited (Western India Products Limited) is an Indian multinational IT Consulting and System Integration services company headquartered in Bangalore, Karnataka. As of March 2014, the company has 147,452 employees servicing over 900 large enterprise & Fortune 1000 corporations with a presence in 61 countries. On 31 March 2014, its market capitalization was approximately ₹1.27 trillion (\$20.8 billion), making it one of India's largest publicly traded company and seventh largest IT services firm globally.

To focus on core IT Business, it demerged its non-IT businesses into a separate company named Wipro Enterprises Limited with effect from 31 March 2013. The demerged company offers consumer care, lighting, healthcare and infrastructure engineering and contributed to approx. 10% of the revenues of Wipro Limited in previous financial year. Recently Wipro has also identified Brazil, Canada & Australia as rapidly growing markets globally and has committed to strengthen the presence in the respective countries over the next 3 years.<sup>[11]</sup>

### **1.1.3 COMPANY OBJECTIVES**

Wipro's main goal was sustainability. The belief was any citizens and their objectives must be in line, or congruent, with society's goals as well.

The Wipro company has three main objective. These objectives are to provide leadership through action, respond to issues of the current generation, and work toward building a good society for future generations.<sup>[11]</sup>

## 1.2 INTRODUCTION TO PROJECT

### 1.2.1 PURPOSE

The Virtual Classroom is a solution to the many problems at a single place for a student to improve the performance via Internet. The current method of study has many issues that are waiting to be answered and has to be modified with growth of Internet.

The major issues in current system are as follows:-

- In current system the academy and Teaching institutes are time bound and are punctual.
- In today's world by the use of technology the learning has become fun by the means of Video lectures, Presentations, E-books, Discussion Forums and many more things across the Internet.
- In the current scenario teachers and students can communicate with each other during the working hours only this will lead to the condition that teacher or students are having something that they are willing to share with others and want to discuss after college hours.

### 1.2.2 BACKGROUND

Virtual Classroom is going to be used by the existing organizations as well as educational institutes that exists in reality and are trying to make their way of learning more strong and interesting for an employee and the student respectively.

This also utilises advanced techniques like video-lectures and viewing uploaded contents like e-books and presentations. It also provides messaging module that bridges the gap between student/employee and teacher out of the class or organization and provides more flexibility to naïve users.

It also provides a medium to evaluate the learner's knowledge of a particular course by making them appear for the examination at the end of that course.

### 1.2.3 DEFINITION

Virtual classroom is the way that supports classroom activities that are conducted by particular academy by the means of Internet.

This supports classroom activity with media and technology that makes study more interesting and easy to understand for the students and trainees.<sup>[2]</sup>

“Virtual Classroom is a concept of supporting current educational organizations by the means of easy learning, better administration and more technology oriented way of learning with the help of Internet that makes current way of teaching more interesting.”

### 1.2.4 SCOPE OF THE SYSTEM

Virtual Classroom refers to the conjunction of the teaching and technology. This system works as a binding agent between teacher and student. The ultimate outcome of the system is the various activities that promote the educational networking and is expected to be beneficiary for the students as well as teachers.

The major scope will include online and offline lecture viewing. The online lecture viewing will involve live video conference between a teacher and multiple numbers of students. The offline lecture viewing will include uploading digital media that are useful for the studies like the Power Point Presentation, portable document format, notes etc. Along with that it will empower teacher with a tool that helps them to grade the student.

## 1.3 FEASIBILITY STUDY

It is an estimate that is made up of whether the users of the system need to be satisfied using the current software and hardware technologies. The study will decide if the proposed system will be cost-effective from a business point of view and if it can be developed within given existing budgetary constraints. A feasibility study should be relatively cheap and quick. So, the result should inform the decision of whether to go ahead or not.

The feasibility study of the System to be developed and need to be conducted before initiating the project development

Major areas for feasibility study are:

### 1.3.1 OPERATIONAL FEASIBILITY

Operational Feasibility checks whether the system is operationally feasible or not. It will examine the various operational parameters for the same. We will check operational feasibility of the given system by answering certain questions which are listed below.

*Does system provide adequate throughput and response time?*

This system will provide adequate throughput and adequate response time to make the system operationally feasible, make faster operation of different modules of the system. Response time is very critical for the system for its faster operation.

*Does the system provide end-user and manager with timely, patient, accurate and usefully formatted information?*

The system will provide end-user with timely information. The system will provide information such as new designed products, upcoming products, discounts etc. The system will provide this information on time. It will also provide accurate feasibility of orders and production management.

*Does the system offer adequate control to protect against fraud and embezzlement and to guarantee the accuracy and the security of data and information?*

Our system will provide certain safety measurements in code to protect against various frauds. Here for verifying user, Email will be sent to the user he/she registers and the link is sent of account verification on his/her email id and hence the user will be allowed to access further tasks. Thus fake customers are restricted. Also there is a provision that once a user has registered cannot register with same username, email id again. Also he/she can only view the general details. He cannot view the personal details of other user, providing the security to one's data. A customer can edit/update only his/her own information. Every user is provided certain rights according to which he/she can access the system.

*Does the system make maximum use of available resources including people, time, flows of forms, minimum processing delays and the like?*

Our system will make maximum use of available resources such as utilizing maximum functionalities of .NET, also utilizes maximum man-power and along with it, it maintains time duration. It will also maintain various flows of forms for the proper working of the system. It will keep a watch on the processing and provides necessary functionalities to overcome the processing delays. It will utilize each resource with proper time duration to maintain the efficient working of the system. This is necessary to make the system operationally feasible.

*Does the system provide desirable & reliable service to those who need it? Is the system flexible and expandable?*

Our system will provide desired characteristics and services to the various users. The system follows three tier architecture of application development with Presentation, Business and Data access separated into different parts / tiers which have their own role as their name suggests. If there is any expansion in one of the tiers, only that one needs to be amended. For e.g.: a change in presentation tier does not affect the business class library.

### **1.3.2 ECONOMIC FEASIBILITY**

Economic feasibility has been done in advanced for estimating the cost of the proposed system. Cost-benefit analysis of system is done. Here all the costs scheduled to the system i.e. direct and indirect costs are calculated and it is checked to see whether it is affordable or not. This checks the economic feasibility. Our system will have affordable costs both direct and indirect costs. So the system will be economically feasible. Our system will need tools like Visual Studio 2010 and MS SQL Server 2008. This software is easily available and will be affordable to use for developing the system. Our system will reduce time and also money for the given functionalities required for developing the system. So the system will be economically feasible given the conditions and functionalities completed in given amount of time.

But at user side we require webcam and fast web connection so this can charge a little bit to user to access the system. Thus the cost of hardware will be higher.

### 1.3.3 TECHNICAL FEASIBILITY

Technical Feasibility refers to the ability of process to take advantages of current state of technology with pursuing further improvement. Technical feasibility will be addressed by following explanation.

*Is the proposed technology or solution practical?*

The proposed technology is practically quite feasible. It is mature enough to tackle the problems and give necessary services. This system will include a larger database and technology needs to be practically very sharp.

*Do we currently possess necessary technology?*

The proposed technology is currently available and has proven to be worth the effort. Acquisition of the proposed technology is not a difficult task.

*Do we possess necessary technical experts and is the schedule reasonable?*

If we are building a system for a specific application we must check whether that we have necessary experts with us. Does our team possess required knowledge of the system? If we are working on .NET, it is required that the team should have the knowledge of .NET. If the team does not possess it, then learning curve of new system will have an impact on the development of software.

### 1.3.4 SCHEDULE FEASIBILITY

As per our application, we have already divided tasks among all members. Generally we work in “democratic decentralized” manner for completing the given work including analysis, designing and coding.

## 1.4 PROBLEM SPECIFICATION

### 1.4.1 SOFTWARE REQUIREMENT ENGINEERING

Requirement analysis in systems engineering and software engineering, encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product, taking account of the possibly conflicting requirements of the various stake holders analyzing, documenting, validating, and managing software and system requirements.

Requirement analysis is critical to the success of a system or software project. The requirements should be documented, actionable, measurable, testable, traceable and related to identified business needs or opportunities, and define to a level of detail sufficient for system design.<sup>[3]</sup>

### 1.4.2 REQUIREMENT SPECIFICATION

There are two types of main requirement specification:

- ❖ Functional Requirements.
- ❖ Non-Functional Requirements.

#### 1.4.2.1 Functional Requirements

##### 1. Online Lectures:-

Video nowadays is trending way of learning as it avails you look and learn concept. Video lecture is actually defined by the purpose of recording the lectures delivered by the teacher during the class hour. This module refers to the review of lectures and chooses the appropriate videos that can help student learn from home via internet. This also is a way to revise the things student has learned during the lecture at any time and from any place. The only condition is he/she must have to be connected with the internet with good enough speed and must have a webcam.

The video lectures include recording devices that can record the ongoing lectures and can return it in a movie format that can be streamed over the internet as and when the notification of a live video chat is uploaded.

Major Functionalities of this specification include

- Time allocation for online lecture
- Video conferencing

## **2. Registration:-**

This is about creation of every type of user and every entity of system including creation of department to subjects and this also includes editing in the details of those entities and even allows removing them as and when they become useless. This module considers the function that helps to maintain the system and manage them in better way.

The major part of this module includes signup and login by the user. The user can be a teacher, a student or an administrator.

Major functionalities of this module are:

- Sign up for new user.
- Log-in by the existing user.
- Selecting the course which a user wants to study.
- Authentication of teachers.
- Profile viewing and editing.
- Changing course by both teacher and student on completion of the previous course.

## **3. Offline Lectures:-**

Offline Lectures are the features of the system and are needed to be managed either by teacher or admin. This also empowers users with privilege to view anything they want to which is based on the course they are taking. A teacher can also view the uploaded content. This also includes its management that is removing undesired things by the time.

The important operation allowed inside this module is to upload the supporting documents and permits the students and teacher to view content.

Major functionalities of this module are:

- Content uploading by the teacher.
- Content downloading.

#### **4. Personal Messages to Solve Queries:-**

Personal message module will be used by the teachers and students to have a two-way communication between both of them. Any student having doubt related to his course will send a message to a teacher who is offering that course. The teacher will send back a reply message to the student after solving his/her query.

Major functionalities of this module are:

- Selecting the teacher to whom the student wants to send the message to solve his doubts.
- Sending the message.
- Teacher sending back the reply to the student.

#### **5. Examination:-**

It includes functionality of examinations. At the completion of the course teacher will generate an objective test. All the students applying for that course need to appear for it. After the test completion, the test will be evaluated using in-built answer keys generated by teachers and the Admin will be responsible for generating the report card. This report card will be viewed by each and every student who appeared for the test.

Major functionalities of this specification are:

- Generating test papers which will be done by teachers.
- Appearing for the tests on test dates which will be done by the students.
- Admin generating the report at the end of the test.
- Report Viewing by the student.

#### **1.4.2.2 Non-functional Requirements**

##### **1. QUALITY REQUIREMENT**

The quality in software development process is maintained by periodic reviews, documentation and verification at all appropriate stages. Quality review was done at the component level and when the data components were merged together. Also the progress report of every week was submitted to the college for verification.

##### **2. READABILITY**

Appropriate comments in the project source code are provided to provide readability so that the user can easily read and understand the project if need be. So the project will be helpful for interested person. Every care is taken that the application is functionally correct. Reliability is a must in the application to make it worth for the Client Company. A great degree of care has to

be taken to ensure minimum / zero defects in the code. Also if there is an error occurring then a custom error page is made to be visible. This is done because if the user of the system sees an error page with all details then he might get confused and close down the project. In order to remove the fear, if any error occurs then it is redirected to custom page.

### **3. MODULARITY**

The project was initially divided into different modules so as to provide easy understanding and debugging of the system. When module checking was completed satisfactorily the modules were merged into one system.

### **4. MODIFIABILITY**

With the help of modularity and readability of the source code of the program the system will be easy to modify in the future as and when needed.

### **5. PORTABILITY**

The project will be easy to implement on the client system which satisfy the minimum hardware requirements.

### **6. EASY TO USE**

This project will be easy to use and so shall incorporate self-explanatory GUI. The GUI contains the presence of tooltips and indications to navigate properly across the system. The system is provided with a user guide which may be accessed by the user when he faces some difficulty.

### **7. MAINTAINABILITY**

The project will provide easy maintenance of the otherwise loosely kept data which is only saved in the system but not used fruitfully. When an application is used, it has to be maintained. There could be additional requirements in terms of added functionality or feature. As the application is not to be maintained by the developers, the code kept is as less complex as possible such that it can be easily understood by the relevant person for modification. Also when new functionality was implemented but later on was not used then that data was also kept in various versions. If that data is also required to be implemented then that data can be taken from the earlier versions. This can be done easily by referring to the document which contains the details of all new additions in all the versions.

### **8. FAULT TOLERANCE / ERROR REPORTING:**

Since the application will be used by non IT users it might be possible that operation might result into errors. The application should provide user friendly error messages and fault tolerance facility whenever any error occurs so that employees can understand and act in

accordance. Also errors which are not yet identified and occur then those errors are logged into the database and the user is redirected to the same page which can be informed to the developer for further assistance.

## 9. SECURITY

We believe that our software is secured enough from any type of attacks. Also the information about the users (eg: username, password) stored in the database is kept secret from the other anonymous users. It does not allow the user with invalid login and provides a maximum of 3 trials for invalid logins. Entering URL directly without logging in does not display information. Access to server scripts is authenticated. A strong AES encryption technique is used for storing and fetching the password from the database.

### 1.4.2.3 Constraints

There are some constraints of developing this website:

This System uses only MySQL connectivity to store database. The system will not work using some other database management system.

- ❖ To view this system must need **Web browser**.
- ❖ **Regulatory Policies:** The regulatory policies in our project are: The administrator should have sufficient authority to load the system. Teacher should be authenticated.
- ❖ **Hardware Limitations:** There must be enough hardware resources at the client as well as server side as this project needs to have communication between the two. Moreover we will provide Video Conferencing so there should be a good network connection and high bandwidth as well as webcam and microphone.
- ❖ **Reliability Requirements:** Reliability of system is complex concept, which should always be considered at the system rather than the individual component level. Because the components in a system are interdependent, a failure in one component can be propagated through the system and affect the operation of other components. We have prepared reliability metrics were first devised for hardware components. Hardware component failure is inevitable due to physical factors such as mechanical abrasion, electrical heating, etc.
- ❖ **Safety and Security Consideration:** The application is secure enough as here is the system where username and password are used. The password is encrypted and stored in the database.

## 1.5 SOFTWARE DEVELOPMENT MODEL

In software engineering, a software development methodology (also known as a system development methodology, software development life cycle, software development process, software process) is a division of software development work into distinct phases (or stages) containing activities with the intent of better planning and management. It is often considered a subset of the systems development life cycle. The methodology may include the pre-definition of specific deliverables and artifacts that are created and completed by a project team to develop or maintain an application.<sup>[1]</sup>

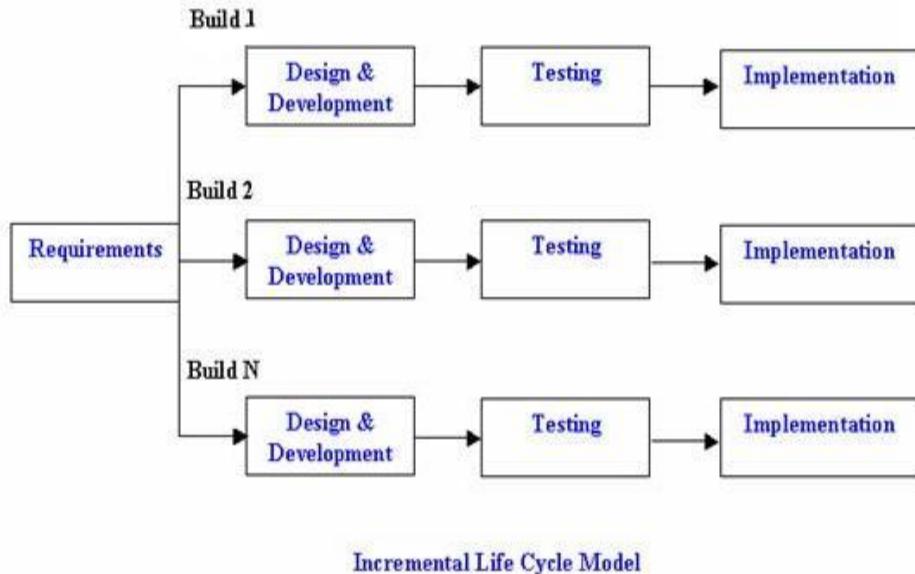
Common methodologies include waterfall, prototyping, iterative and incremental development, spiral development, rapid application development, extreme programming and agile methodology. Some people consider a life-cycle "model" a more general term for a category of methodologies and a software development "process" a more specific term to refer to a specific process chosen by a specific organization. For example, there are many specific software development processes that fit the spiral life-cycle model.

### 1.5.1 INCREMENTAL MODEL

Various methods are acceptable for combining linear and iterative systems development methodologies, with the primary objective of each being to reduce inherent project risk by breaking a project into smaller segments and providing more ease-of-change during the development process.<sup>[12]</sup>

The basic principles are:

- A series of mini-Waterfalls are performed, where all phases of the Waterfall are completed for a small part of a system, before proceeding to the next increment, or
- Overall requirements are defined before proceeding to evolutionary, mini-Waterfall development of individual increments of a system, or
- The initial software concept, requirements analysis, and design of architecture and system core are defined via Waterfall, followed by iterative Prototyping, which culminates in installing the final prototype, a working system.



*Figure 1.2:* Incremental Life Cycle Model<sup>[12]</sup>

### 1.5.2 JUSTIFICATION

In the Software Development Life Cycle, there are different stages: requirement gathering, feasibility study, requirement determination, designing, coding and implementation and then testing and debugging so we can first identify requirements and we can do the feasibility study. Thus it is beneficial to first identify the requirements and then through feasibility study we can analyze these requirements and determine them for implementation. Then after gathering all necessary requirements we can easily design them and then the implementation becomes very easy and faster. The Client Requirements when are very fuzzy then that enforces us to choose a model that allows us to move back to any previous phase of the development life cycle, make changes over there, & again get it implemented in the next phase. This repeats until the satisfactory level is reached. Thus as and when requirements arise the changes can be made in the system in a very short period of time. This is possible only using the Incremental Model. Thus we have opted for this model as it is most feasible model for our project.

## 1.6 PROJECT PLAN

### 1.6.1 PROJECT SCHEDULE

Software Project Scheduling Principles:

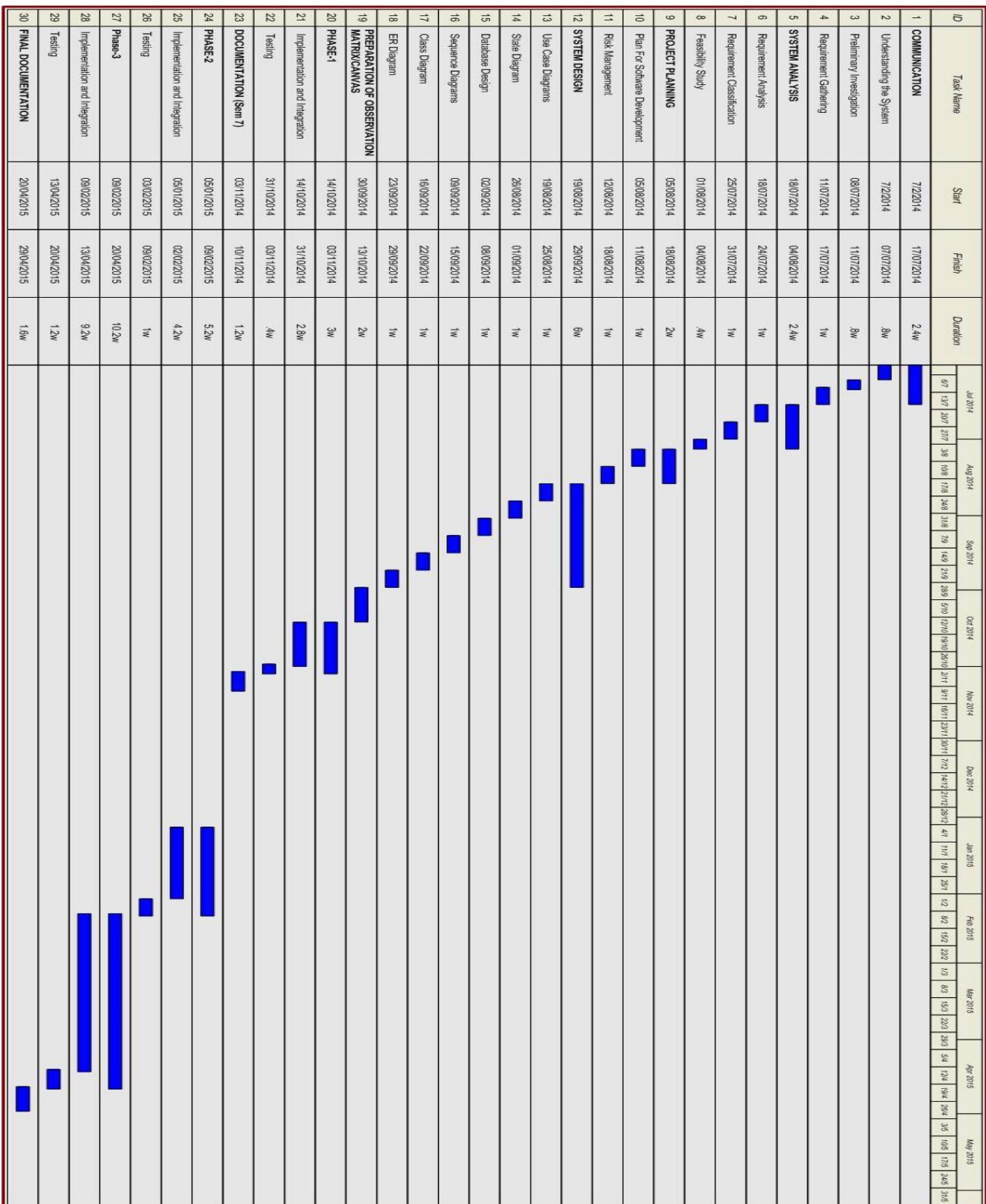
- Compartmentalization - the product and process must be decomposed into a manageable number of activities and tasks.
- Interdependency - tasks that can be completed in parallel must be separated from those that must be completed serially.
- Time allocation - every task has start and completion dates that take the task interdependencies into account.
- Effort validation - project manager must ensure that on any given day there are enough staff members assigned to complete the tasks within the time estimated in the project plan.
- Defined Responsibilities - every scheduled task needs to be assigned to a specific team member.
- Defined outcomes - every task in the schedule needs to have a defined outcome (usually a work product or deliverable).
- Defined milestones - a milestone is accomplished when one or more work products from an engineering task have passed quality review.

### GANTT CHART

**Timeline (Gantt) chart** enables software planners to determine what tasks will be need to be conducted at a given point in time (based on estimates for effort, start time, and duration for each task).

## Virtual Classroom

## Introduction



*Figure 1.3- Gantt/ Timeline Chart*

## 1.6.2 RISK MANAGEMENT

There are different categories of risk. Risk that are to be analyzed like project risks , business risks , technical risks , known risks , predictable risks and unpredictable risks. *Project risks* identify potential budgetary, schedule, personal that includes staff and organization, resources, customers and requirement problems and they impact on software projects. *Technical risks* identify potential design; implementation, interface, verification, maintenance problems, specification ambiguity, technical uncertainness and technical obsolesce. *Business risks* threaten the viability of the software to be built. *Known risks* are those that can be uncovered after careful evaluation of the project plan, the business and technical environment in which the project is being developed. *Predictable risks* are extrapolated from past project experience. *Unpredictable risks* are extremely difficult to identify in advance.

## RISK IDENTIFICATION

- 1) Technology:** While system is building / compiling and end-user request to access and manipulate information then system get re-configure and user get configuration error.
- 2) Hardware:** Website runs on some Server. So all hardware related problems like power failure and server down problems must be managed effectively by our hardware team.
- 3) Software:** Website is depending on the database. There are other external libraries and tools like Web-Server, and client tools etc. requires regular maintenance so it won't get failure and we can prevent data lost.
- 4) People:** As Website is a database driven which contains lots of concepts and tools that are used, it require understanding all features and functionalities, also how it get implemented and affected by web-module. So we need to interact to Technical Manager and other employees to understand tool and concepts effectively. So we try to make this risk as small as by writing tutorials about tools and techniques we will be using.
- 5) Schedule:** Each team member should respect the deadlines that the team has decided. When a team member knows that he will be unable to respect a given deadline, he should inform the other team members as soon as possible (preferably more than two days before the deadline), so that the team can find a way to solve the problem.

## RISK ANALYSIS

**Probability** of the risks might be assessed as very low (<10%), low (10-25%), moderated (25-50%), high (50-75%), or very high (>75%).

**Effects** of the risk might be assessed as catastrophic, serious, tolerable or insignificant.

RISK	PROBABILITY	EFFECT
Technology	Moderate	Tolerable
Hardware	Moderate	Critical
Software	Low	Tolerable
Schedule	High	Critical
People	Moderate	Tolerable
Due To Illness	Low	Tolerable

Table 1- Risk Analysis

## 1.7 CODING STANDARDS AND TOOLS

### 1.7.1 INTRODUCTION TO .NET

Being a contributor to the Code Project for quite some time now, it is commendable to see so many articles from various folks in the industry talk about the features of .NET and how a specific features work or what are some of the tips and tricks of the trade. This fever of .NET is very interesting to watch and rest assured that the storms caused by .NET will be as great as the storms caused by C++ when it was introduced. Walking down the web-site, I saw lots of articles on .NET, but I did not see one on: *What is NET? What is it made up of? Why is there so much interest in it?*

This article is a dedication to the above answers. In this article, I will give an understanding of what is .NET and why it came into existence. We will also see some of the core building blocks of .NET and how it is layered. For a deeper insight into each of the building blocks, you anyways have lots of good articles on the Code Project web site. So happy reading!

### 1.7.2 WHY .NET?

The world of computing till date has been chaotic. We have had various languages struggling to interoperate with each other, developers undergoing huge learning curves to shift from one language to another or from one application type to another, non-standard ways of modelling applications and designing solutions and huge syntactic differences between languages. The list goes on....

Past years have seen some solace in the form of enterprise "glue" applications and standards like COM, which put-forth a binary standard of interoperability between application components. But in reality, this was not always true (VB COM found it very difficult to take on VC++ COM). Also, as applications increased in their reach, it was found that rather than re-inventing the wheel for a solution, it was better to take the "service" of another applications specialized for a piece of work.

Thus from a paradigm where applications replicated code to provide common services, we have moved to a paradigm where applications are built as "collaborative units" of components working together. This simple shift has led to the collapse of the current set of architectures and demanded a new programming model:

- A model where applications can be built as reusable components and are sharable over the internet.

- A model that encourages applications to be shared as a "service" (read web services).
- A model that enables true "interoperability" wherein the language used is only a matter of choice, thus enabling organizations to take advantage of existing skill sets.

**Enter .NET.** The .NET Framework is a new computing platform developed by Microsoft that simplifies application development in the highly distributed environment of the internet. .NET is much more than just a platform for developing for the internet, but it is intended for this purpose predominantly, because here, other methods have failed in the past.

### 1.7.3 OVERVIEW OF .NET

The .NET Framework has been developed to cater to the following objectives and requirements:

- To provide a consistent object-oriented environment to develop applications.
- To provide a code execution environment that simplifies deployment and versioning.
- To provide a code execution environment that guarantees the safety of the code that is executing. This includes both code developed internally by an organization or for code developed by 3rd party vendors.
- To provide a code execution environment that eliminates the issues faced by scripted environments with respect to performance.
- To provide a common programming model where the choice of a programming language becomes a matter of choice.

The .NET Framework is made up of two major components: the common language runtime (CLR) and the framework class library (FCL). The CLR is the foundation of the .NET Framework and provides various services that applications can use. The CLR also forms the “Environment” that other applications run on. The FCL is a collection of over 7000+ types that cater to all the services, and data structures that applications will ever need.

The following diagram shows the .NET Framework, its hierarchy and the associated toolset. The diagram is so famous that you can spend some time memorizing its layout!!

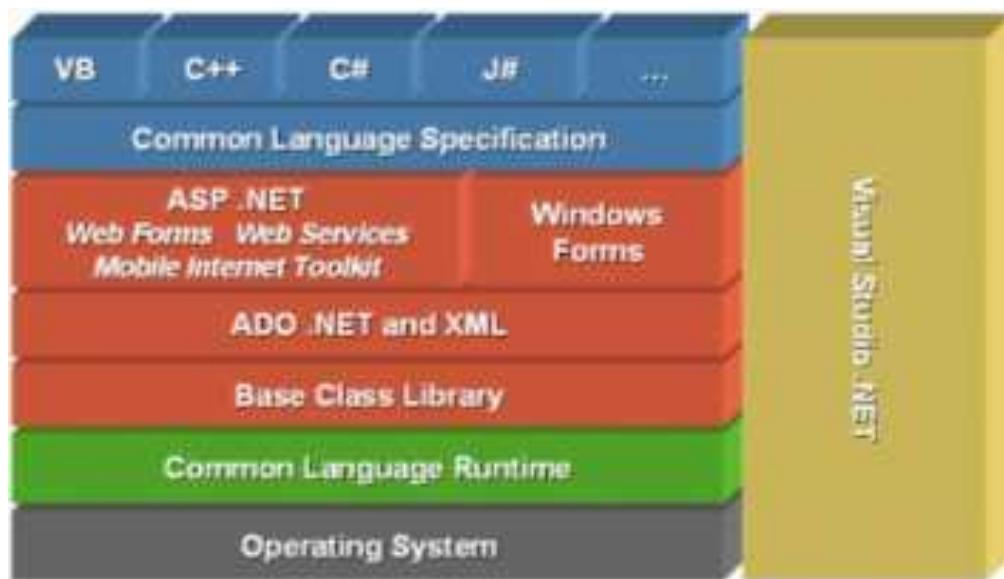


Figure 1.4- .NET framework

At the base of the diagram, you see the operating system which can be (theoretically) any platform. The Common Language Runtime (CLR) is the substrate that abstracts the underlying operating system from your code. The minute it does this, it means that your code has to run using the services provided by the CLR and we get a new name called managed code. The CLR provides its services to applications by providing a standard set of library classes that abstract all the tasks that you will ever need. These classes are called as the Base Class Libraries. On top of this, other development platforms and applications are built (like ASP.NET, ADO.NET and so on). Language compilers that need to generate code for the CLR must adhere to a common set of specifications as laid down by the Common Language Specification (CLS). Above this, you have all the popular .NET languages.

Visual Studio .NET, then is the "glue" that helps you generate .NET applications and provides an IDE that is excellent for collaborative development.

In the subsequent sections, we will delve into the core layers of the .NET framework. Note that application development layers (like ADO.NET, ASP.NET etc.) and development tools (VS.NET) are not dealt with.

## COMMON LANGUAGE RUNTIME

The CLR is the platform on which applications are hosted and executed. The CLR also provides a set of services that applications can use to access various resources (like arrays, collections, operating system folders etc). Since this runtime "manages" the execution of your

code, code that works on the CLR is called as managed code. Any other code, you guessed it, is called unmanaged code.

Compilers and tools expose the CLR's functionality and enable you to write code that benefits from this managed execution environment. To enable the runtime to provide services to managed code, language compilers must also emit metadata that describes the types that we develop in .NET. This metadata is stored along with the type file and makes it "self-describing". Using this information, the runtime automatically handles object layout and manages references to objects, releasing them when they are no longer being used.

When compilers emit code to run on the CLR, they do not emit machine language code. Rather, an intermediate language code is used called Microsoft Intermediate Language (MSIL). MSIL is like an object-oriented version of assembly language and is platform independent. It has a rich set of instructions that enable efficient representation of the code. When a code starts to execute, a process knowning as Just in Time Compilation (JIT) converts the MSIL code into the native processor instructions of the platform, which is then executed. This is shown in the following diagram:

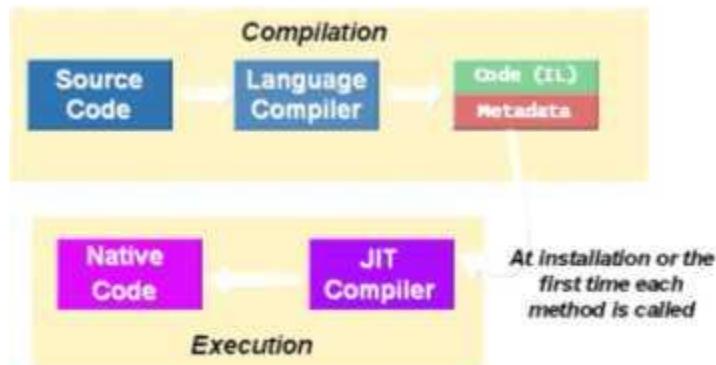


Figure 1.5-CLR

Note that this conversion happens only once. Subsequent calls to the code will execute the native version only. Once the application dies down and is started again, this process is repeated.

The following are some of the benefits of the CLR:

- Performance improvements.

- The ability to easily use components developed in other languages.
- Extensible types provided by a class library.
- New language features such as inheritance, interfaces, and overloading for object-oriented programming; support for explicit free threading that allows creation of multithreaded, scalable applications; support for structured exception handling and custom attributes.

## COMMON LANGUAGE SPECIFICATION

Language interoperability is the ability of code to interact with code that is written using a different programming language. Language interoperability can help maximize code reuse and, therefore, improve the efficiency of the development process. Because developers use a wide variety of tools and technologies, each of which might support different features and types, it has historically been difficult to ensure language interoperability. However, language compilers and tools that target the common language runtime benefit from the runtime's built-in support for language interoperability. To ensure that you can develop managed code that can be fully used by developers using any programming language, a set of language features and rules for using them called the Common Language Specification (CLS) has been defined. Components that follow these rules and expose only CLS features are considered CLS-compliant.

To fully interact with other objects regardless of the language they were implemented in, objects must expose to callers only those features that are common to all the languages they must interoperate with. If your component uses only CLS features in the API that it exposes to other code (including derived classes), the component is guaranteed to be accessible from any programming language that supports the CLS. Components that adhere to the CLS rules and use only the features included in the CLS are said to be CLS-compliant components.

## COMMON TYPE SYSTEM

The common type system defines how types are declared, used, and managed in the runtime, and is also an important part of the runtime's support for cross-language integration. The common type system performs the following functions:

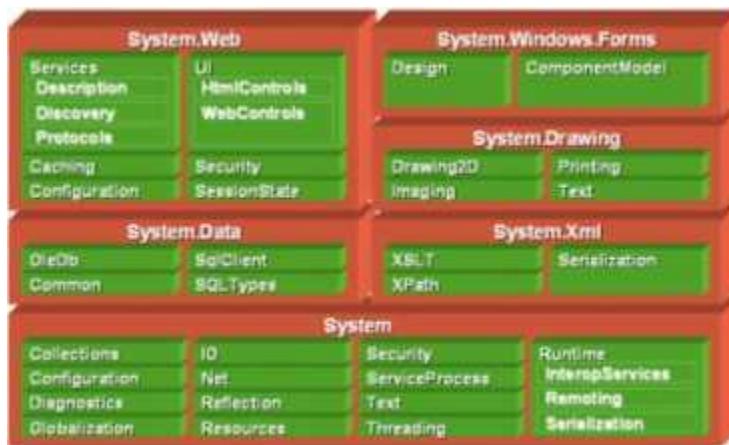
- Establishes a framework that enables cross-language integration, type safety, and high performance code execution.

- Provides an object-oriented model that supports the complete implementation of many programming languages.
- Defines rules that languages must follow, which helps ensure that objects written in different languages can interact with each other. For example, if you have created a class in VB.NET, you can inherit from it in a C# program.

## FRAMEWORK CLASS LIBRARY

Windows programmers coding in C, tend to rely on the Windows API and functions in third-party DLLs to get their job done. C++ programmers often use class libraries of their own creation or standard class libraries such as MFC. Visual Basic programmers use the Visual Basic API, which is an abstraction of the underlying operating system API. In the .NET Framework, all these anachronistic API's are done away with. Rather a new set of functions branded as the framework class library are introduced which contain more than 7000 types. To make learning and using the FCL more manageable, Microsoft has divided the FCL into hierarchical namespaces. The FCL has about 100 namespaces in all. Each namespace holds classes and other types that share a common purpose. For example, much of the window manager portion of the Windows API is encapsulated in the System.Windows.Forms namespace. In this namespace classes that represent windows, dialog boxes, menus, and other elements commonly used in GUI applications are present. A separate namespace called System.Collections holds classes representing hash tables, resizable arrays, and other data containers. Yet another namespace, System.IO, contains classes for doing file I/O.

The following diagram shows the FCL classes and their associated namespaces.



*Figure 1.6-Framework Class Library*

#### **1.7.4 TOOLS AND TECHNOLOGIES USED**

This phase of the software development process deals with a brief study of different hardware used in the computerized system. There is a list of hardware materials used during the making and also during the use of the proposed project. All the hardware needed here are generally the basic configuration of a typical office computer. A list of the hardware requirement used in the system is given below:

❖ **Front End:**

Microsoft Visual Studio 2010, ASP.Net 4.0 with C#.Net 2010

❖ **Back End:**

SQL Server 2008 R2

❖ **Documentation Tools:**

MS Office Word 2010, MS Office Visio 2007

❖ **Reporting Tool:**

MS Office Excel 2007

❖ **Hardware Requirements:**

RAM: 2GB, Hard Disk: 80GB, Processor: Dual Core or Higher, Gateway/routers, Monitor, Keyboard, Mouse, Microphone, Webcam and its utility drivers.

❖ **Operating System:**

Windows XP version or higher. MAC OS and LINUX.

**SYSTEM DESIGN****CHAPTER-2****2.1 DESIGN PRINCIPLES****Why Object oriented approach?**

Here the system is going to build on Object Oriented approach. Object oriented approach is more suitable for the Online Shopping system and this system is similar to it. Object oriented approach helps to understand the whole system and the flow of the system.

Here is the reason why the system is Object oriented...

1. If the system is Object Oriented then it is easy to understand the flow of the system and hence the whole system can be understood.
2. In Object Oriented approach we have Use case to understand the modules and functionalities of each user, Activity to understand the flow, Sequence to know the process flow etc.

Hence In many way Object Oriented approach is more suitable and easier to understand for this system. Hence Object oriented approach is used here.

**2.2 CLASS DIAGRAM**

The class diagram is the main building block of object oriented modelling. It is used both for general conceptual modelling of the systematics of the application, and for detailed modelling translating the models into programming code. Class diagrams can also be used for data modeling. The classes in a class diagram represent both the main objects, interactions in the application and the classes to be programmed.

In the diagram, classes are represented with boxes which contain three parts:

- The top part contains the name of the class. It is printed in bold and centered, and the first letter is capitalized.
- The middle part contains the attributes of the class. They are left-aligned and the first letter is lowercase.
- The bottom part contains the methods the class can execute. They are also left-aligned and the first letter is lowercase.

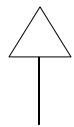
**SYMBOLS USED:**



Class



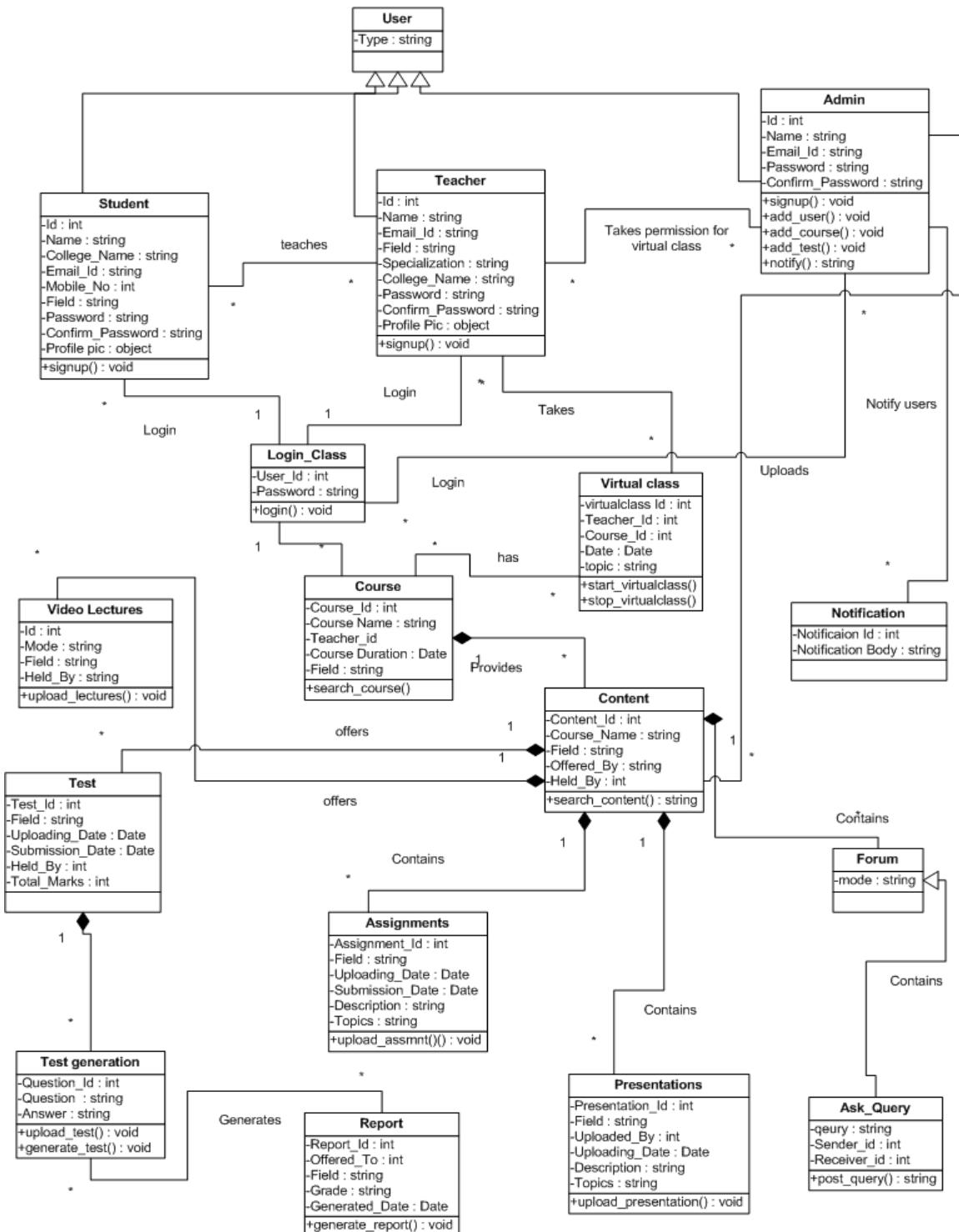
Binary Association



Generalization



Composition

**DIAGRAM:***Figure 2.1- Class Diagram for Virtual Classroom*

## 2.3 USE-CASE DIAGRAM

A use case diagram is a visual representation of distinct business functionality in a system. The key term here is distinct business functionality. To choose functionality a business person is a likely candidate to ensure that the business functions in your problem. As first step in identifying use case in your problem statement. Each of these functions can be classified as a potential use case. Remember that identifying become more easily evident.

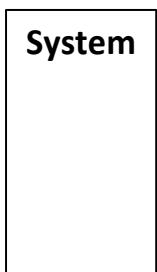
### SYMBOLS USED:



Usecase



Actor



System Boundary



Connector

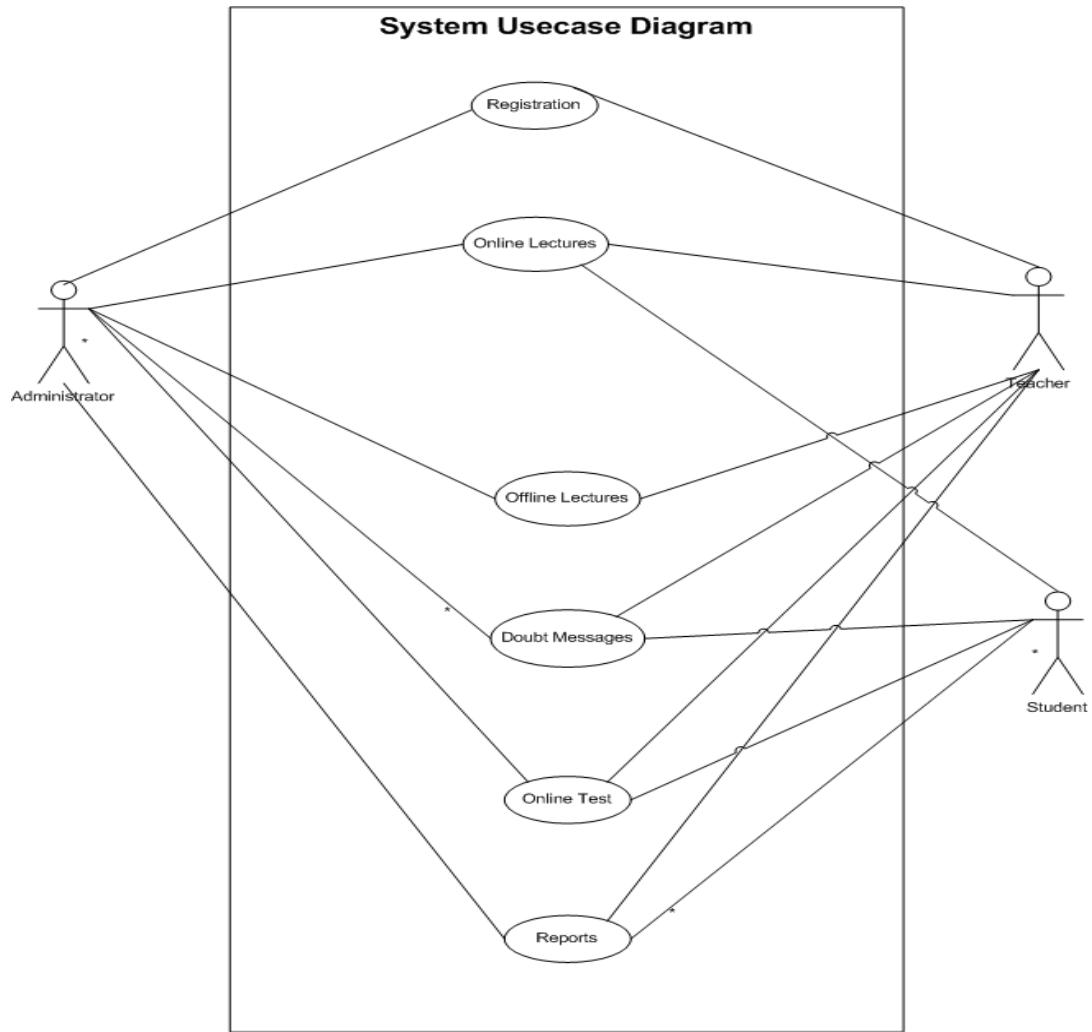
**DIAGRAMS****1) System Usecase**

Figure 2.2- System Usecase Diagram

## 2) Registration Usecase

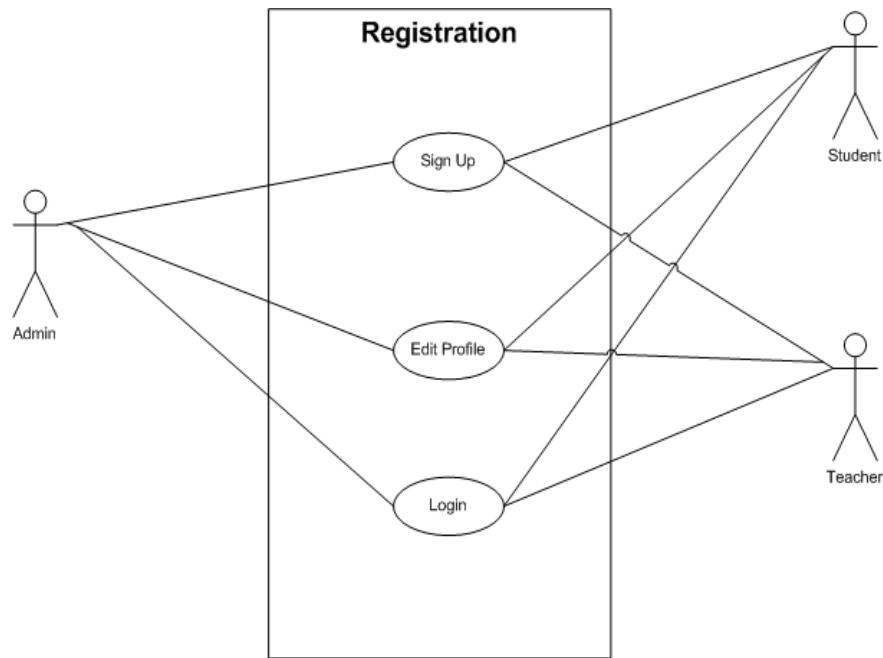


Figure 2.3- Registration Usecase

## 3) Offline Content Management

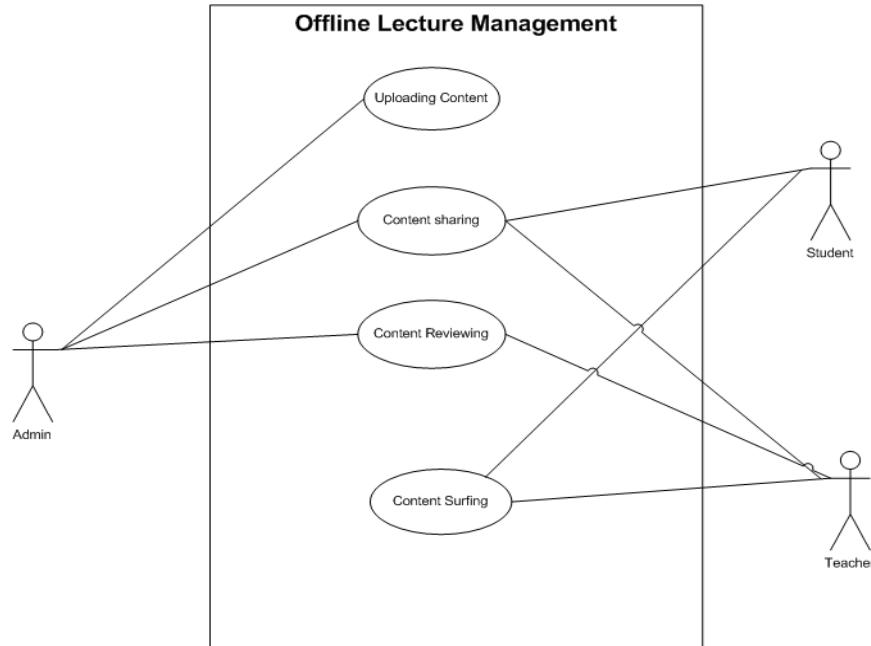


Figure 2.4- Offline Lecture Management Usecase

#### 4) Video Lecture

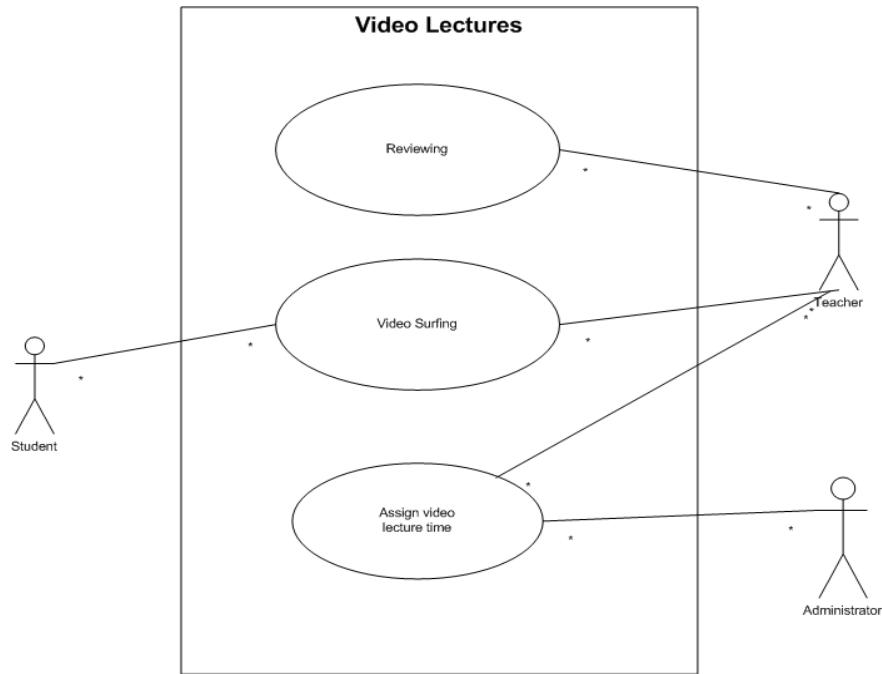


Figure 2.5- Video Lecture Usecase Diagram

#### 5) Personal Message

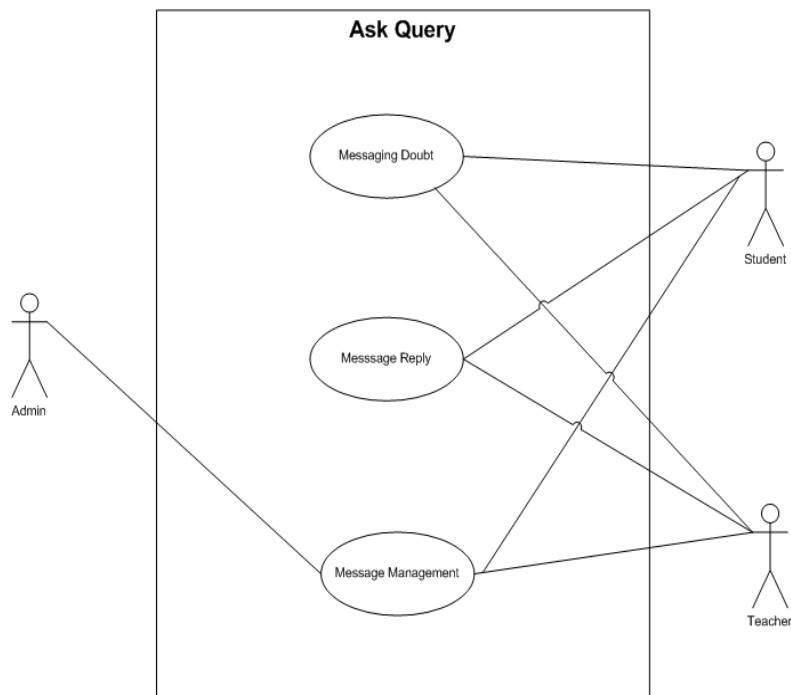


Figure-2.6- Personal Message Usecase Diagram

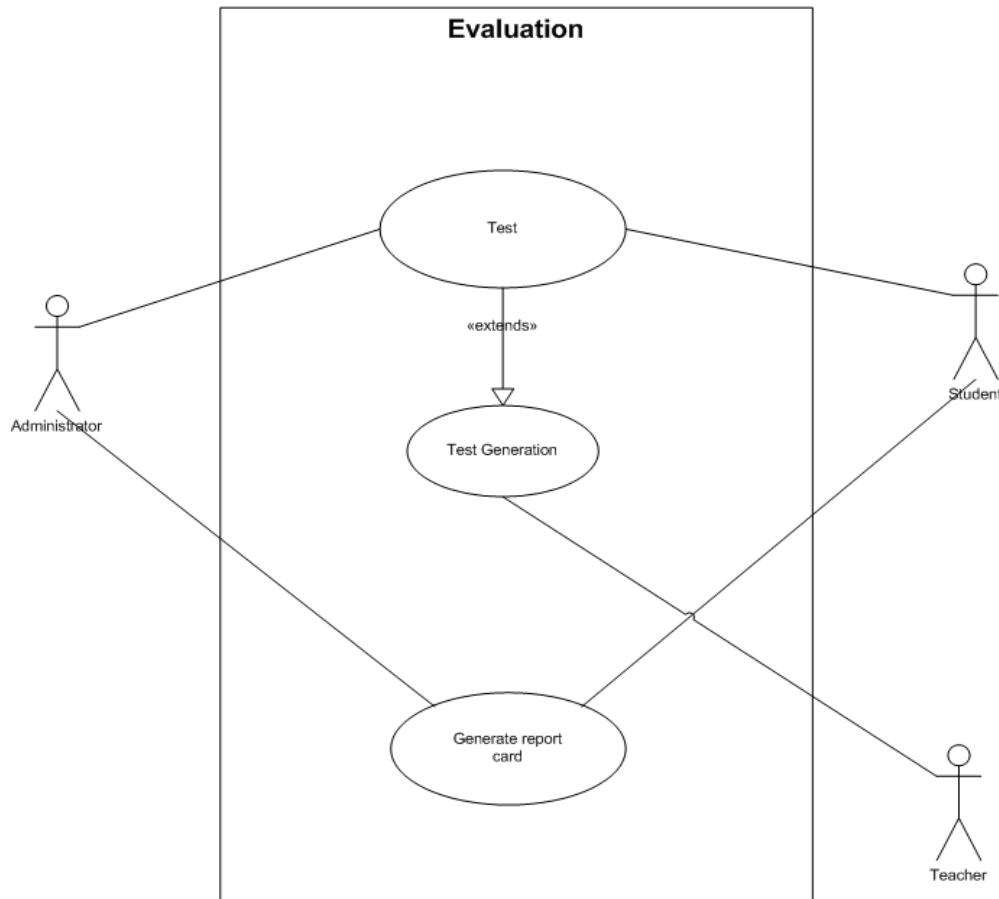
**6) Evaluation**

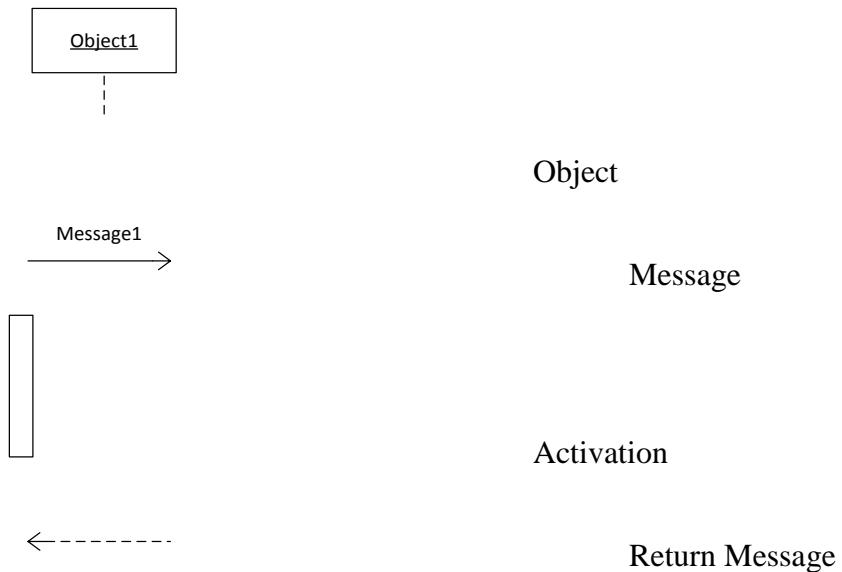
Figure 2.7- Evaluation Usecase Diagram

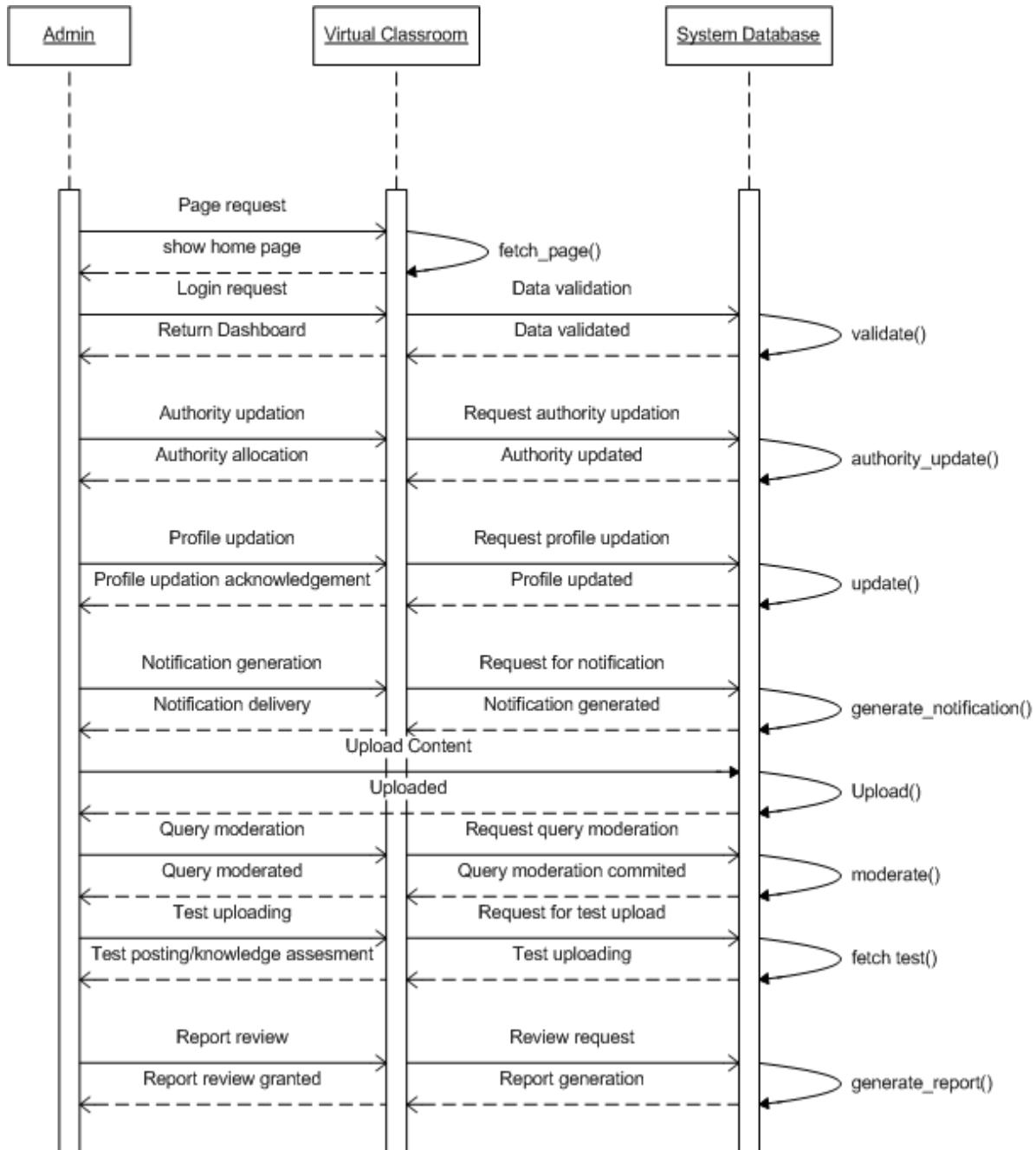
## 2.4 SEQUENCE DIAGRAM

A sequence diagram is an interaction diagram that emphasizes the time ordering of the messages. Graphically, a sequence diagram is a table that shows objects arranged along the X-axis and messages, ordered in increasing time, along the Y-axis.

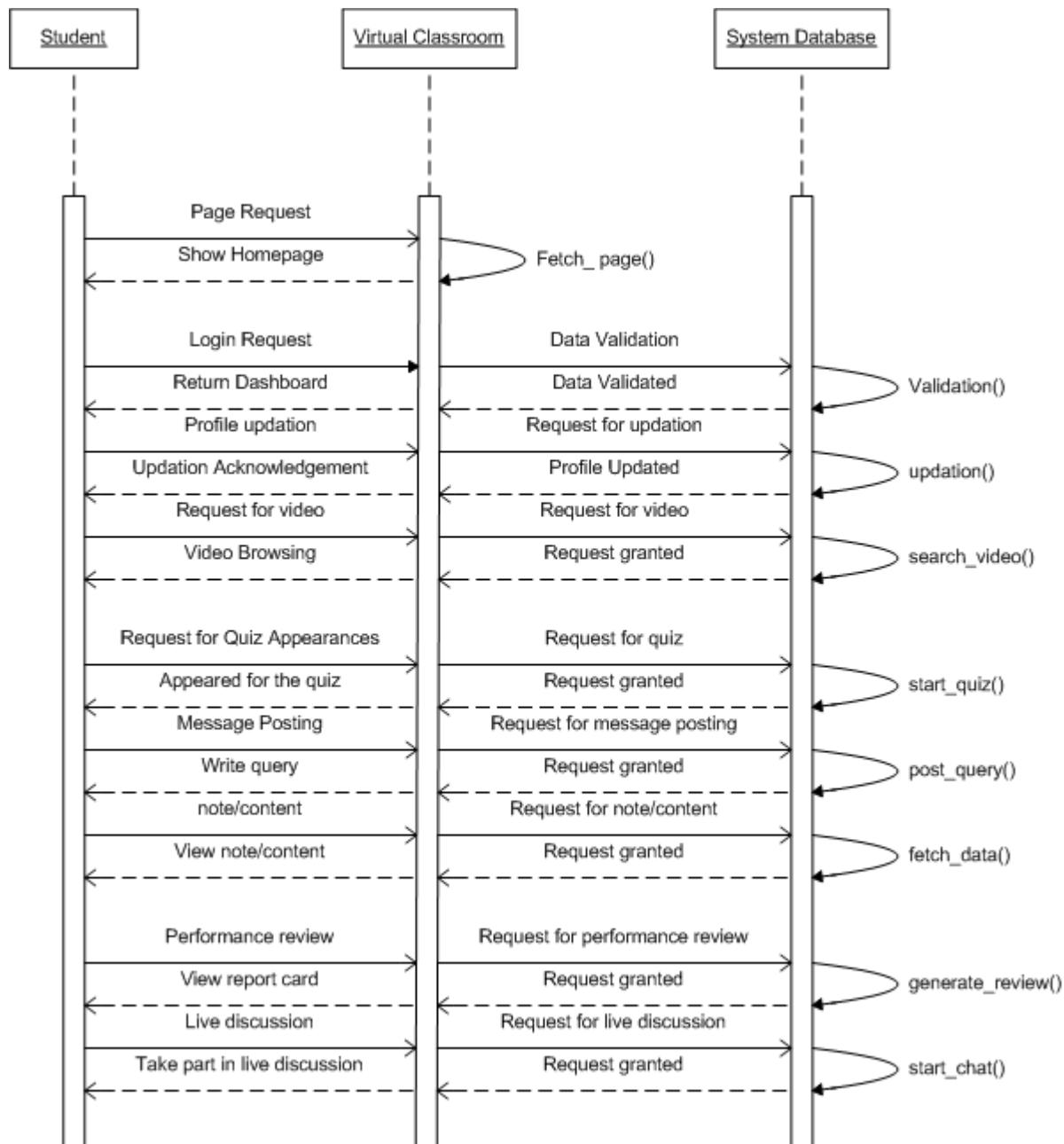
Typically you place the object that initiates the interaction at the left, and increasingly more sub-routine objects to the right. Next, you place the messages that these objects send and receive along the Y-axis , in order of increasing time from top to the bottom. This gives the reader a clear visual cue to the flow of control over time.

### SYMBOLS USED:



**DIAGRAMS:****1) Admin Sequence***Figure 2.8- Admin Sequence Diagram*

## 2) Student Sequence



*Figure 2.9- Student Sequence Diagram*

### 3) Teacher Sequence

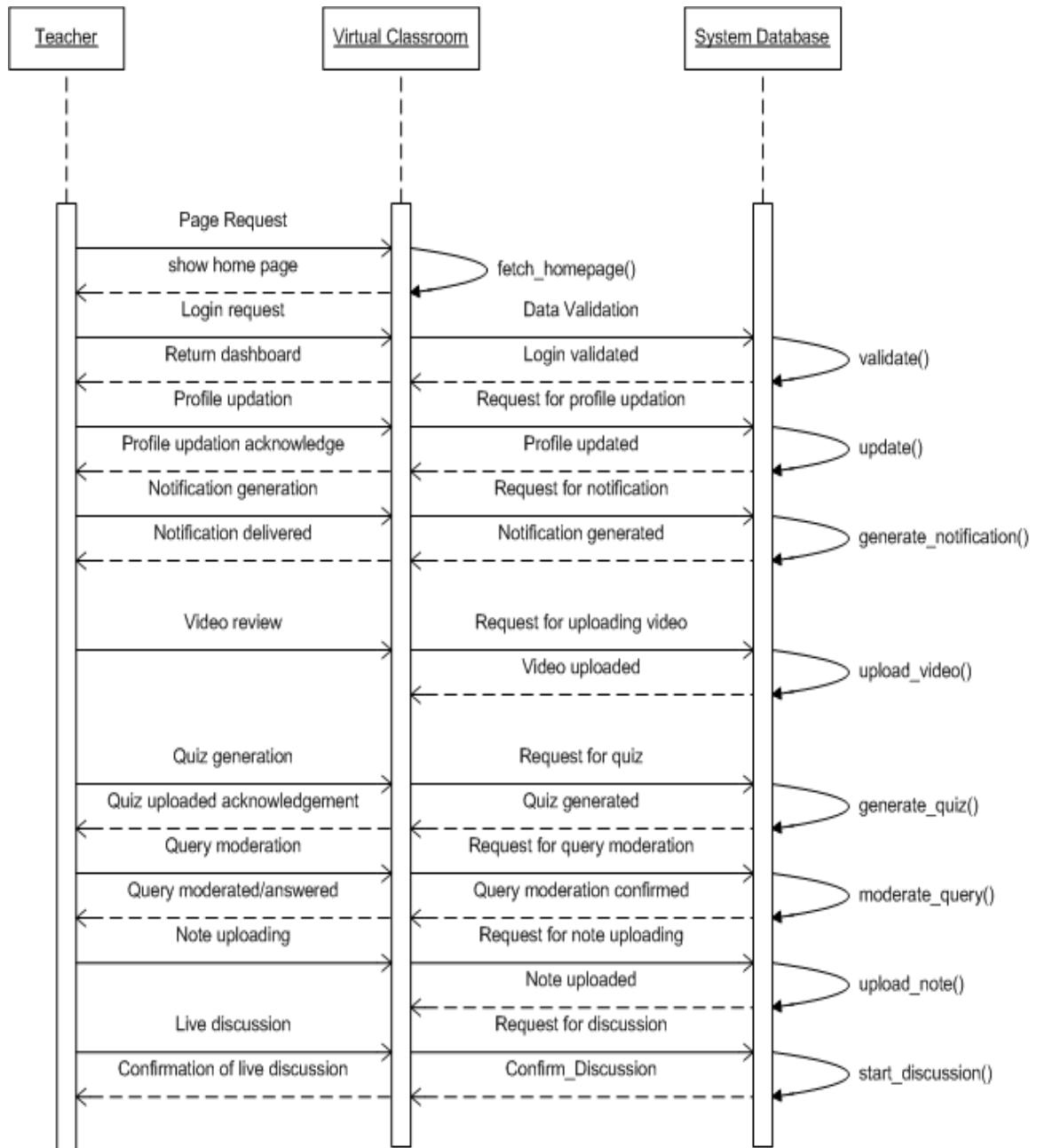


Figure 2.10- Teacher Sequence Diagram

## 2.5 STATE DIAGRAM

State diagrams are used to give an abstract description of the behavior of a system. This behavior is analyzed and represented in series of events, that could occur in one or more possible states. Hereby "each diagram usually represents objects of a single class and track the different states of its objects through the system".

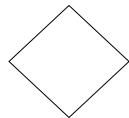
### SYMBOLS USED:



State



Transition



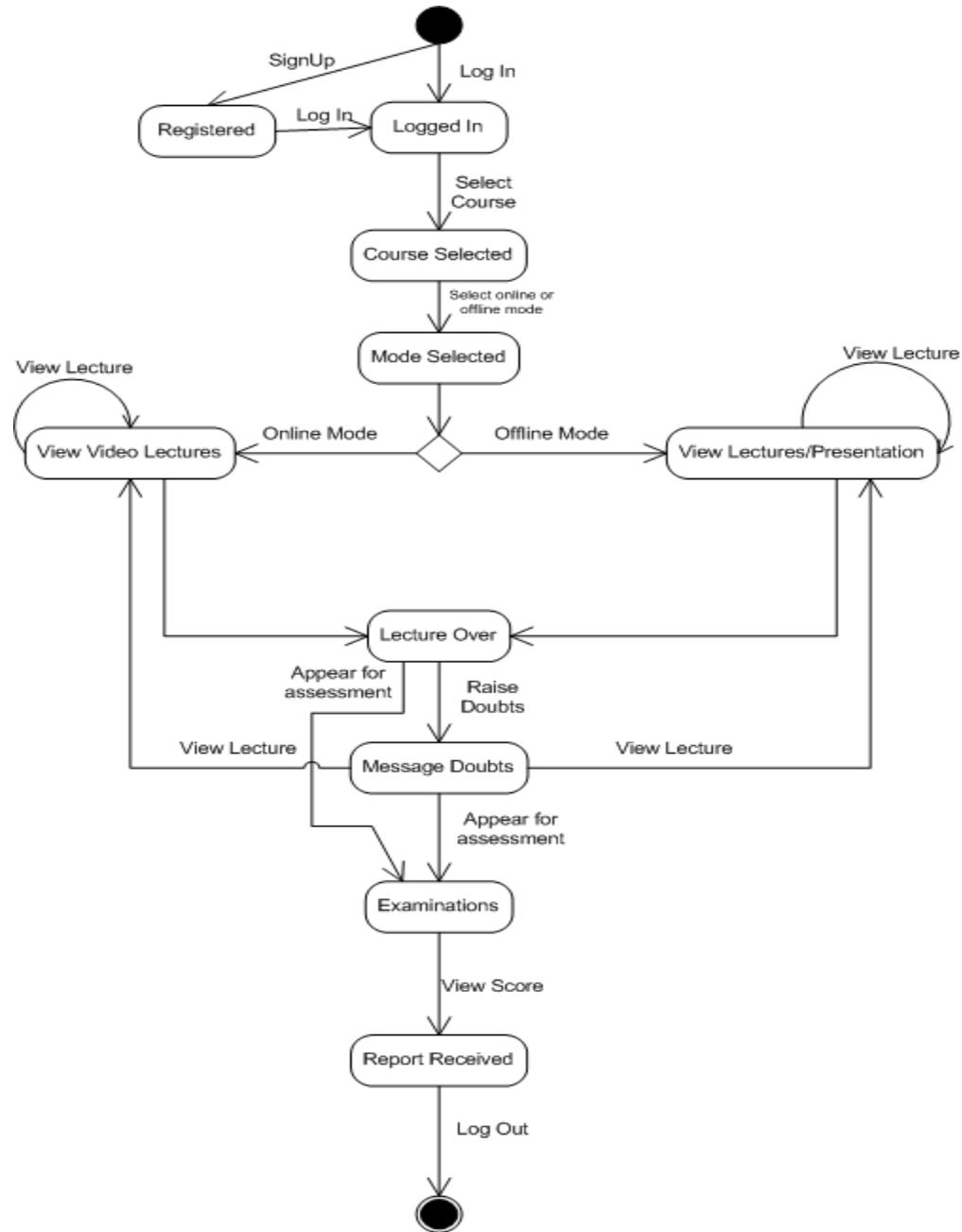
Branch condition



Start



Stop

**DIAGRAMS:****1) Student***Figure 2.11- Student State Diagram*

## 2) Teacher

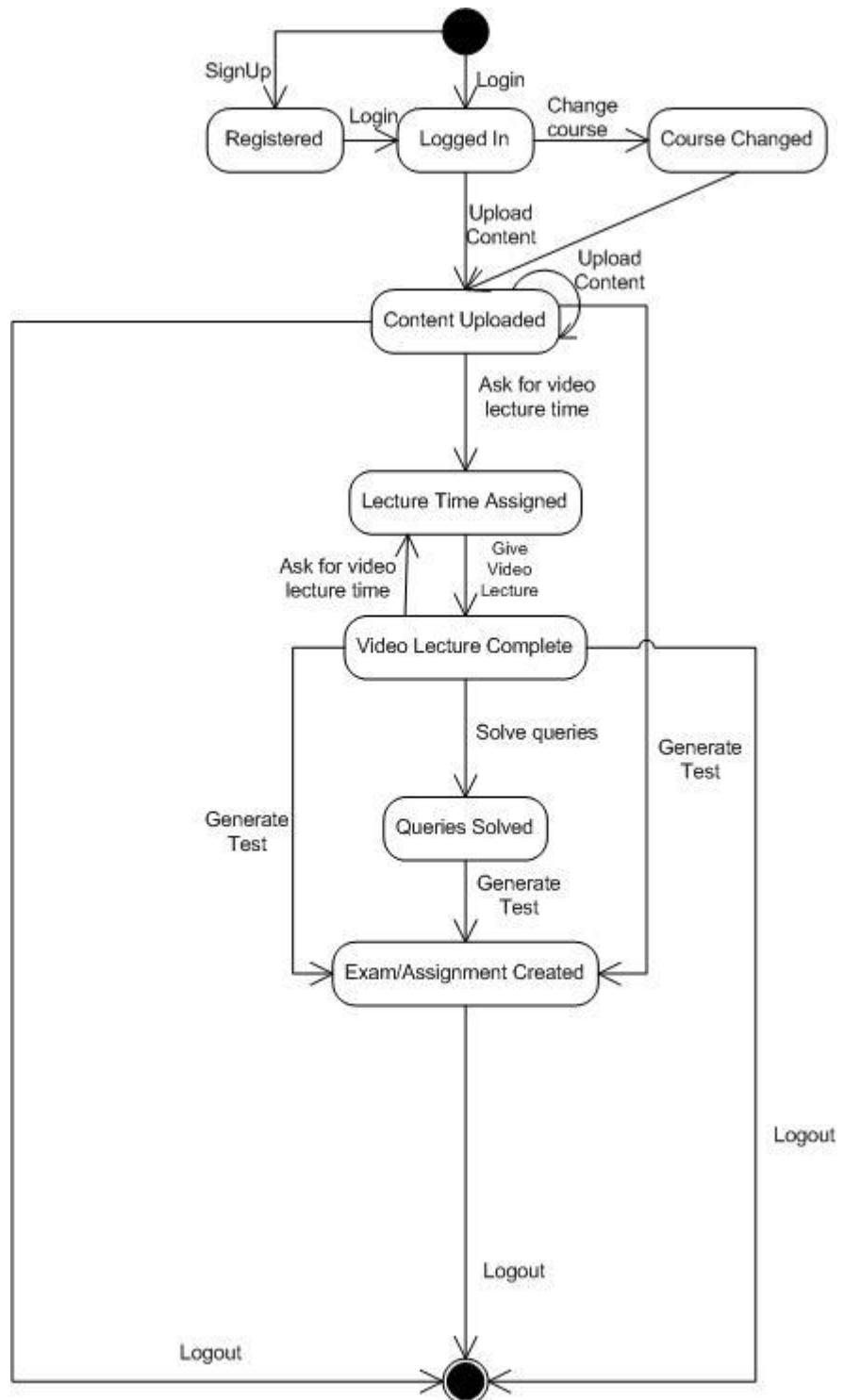
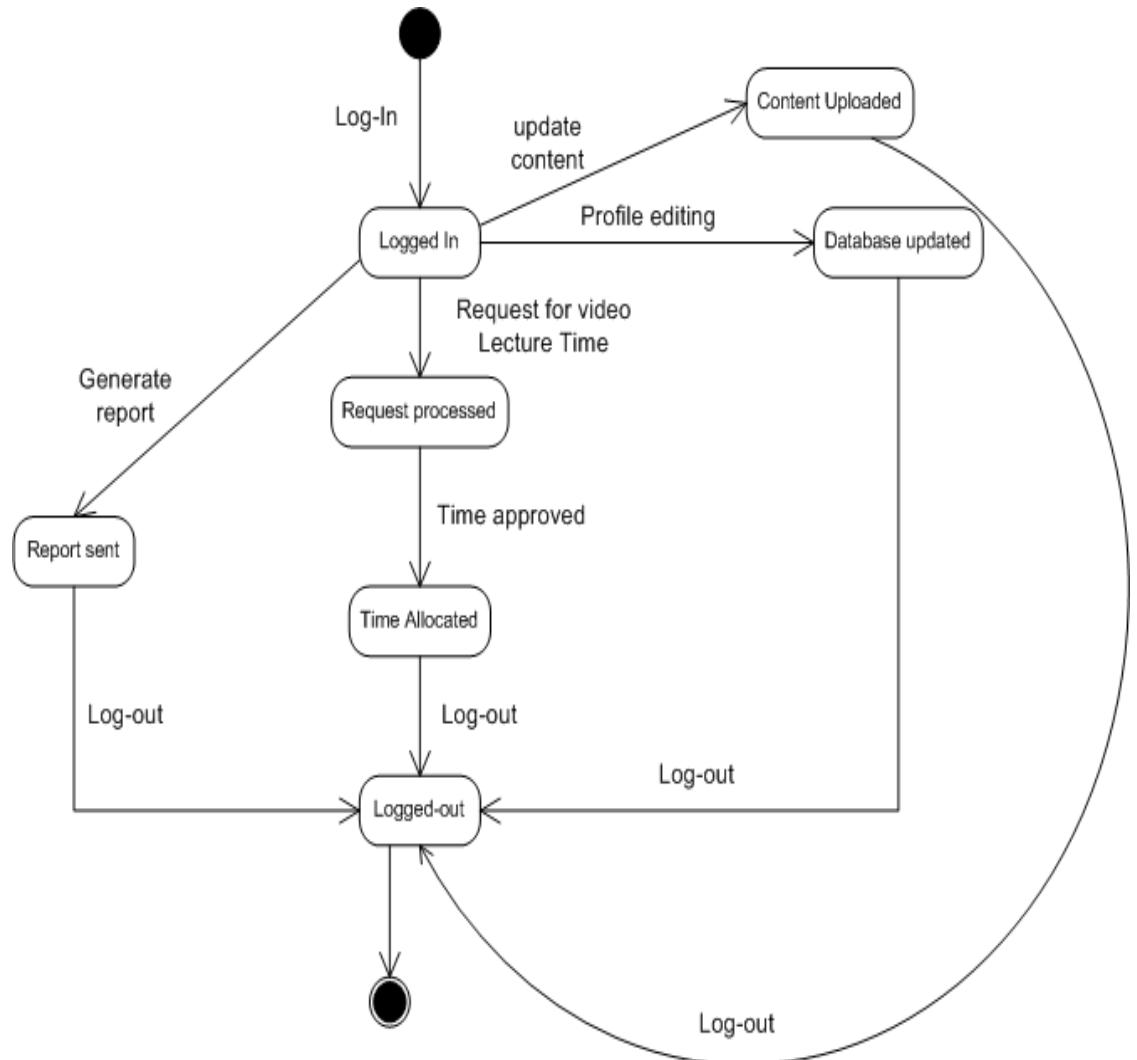


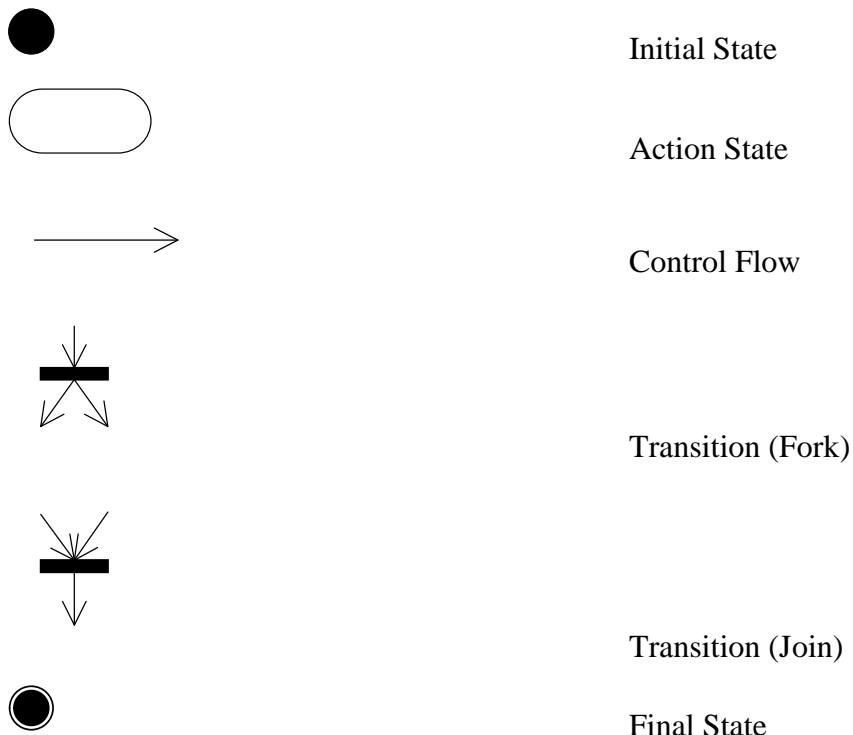
Figure 2.12- Teacher State Diagram

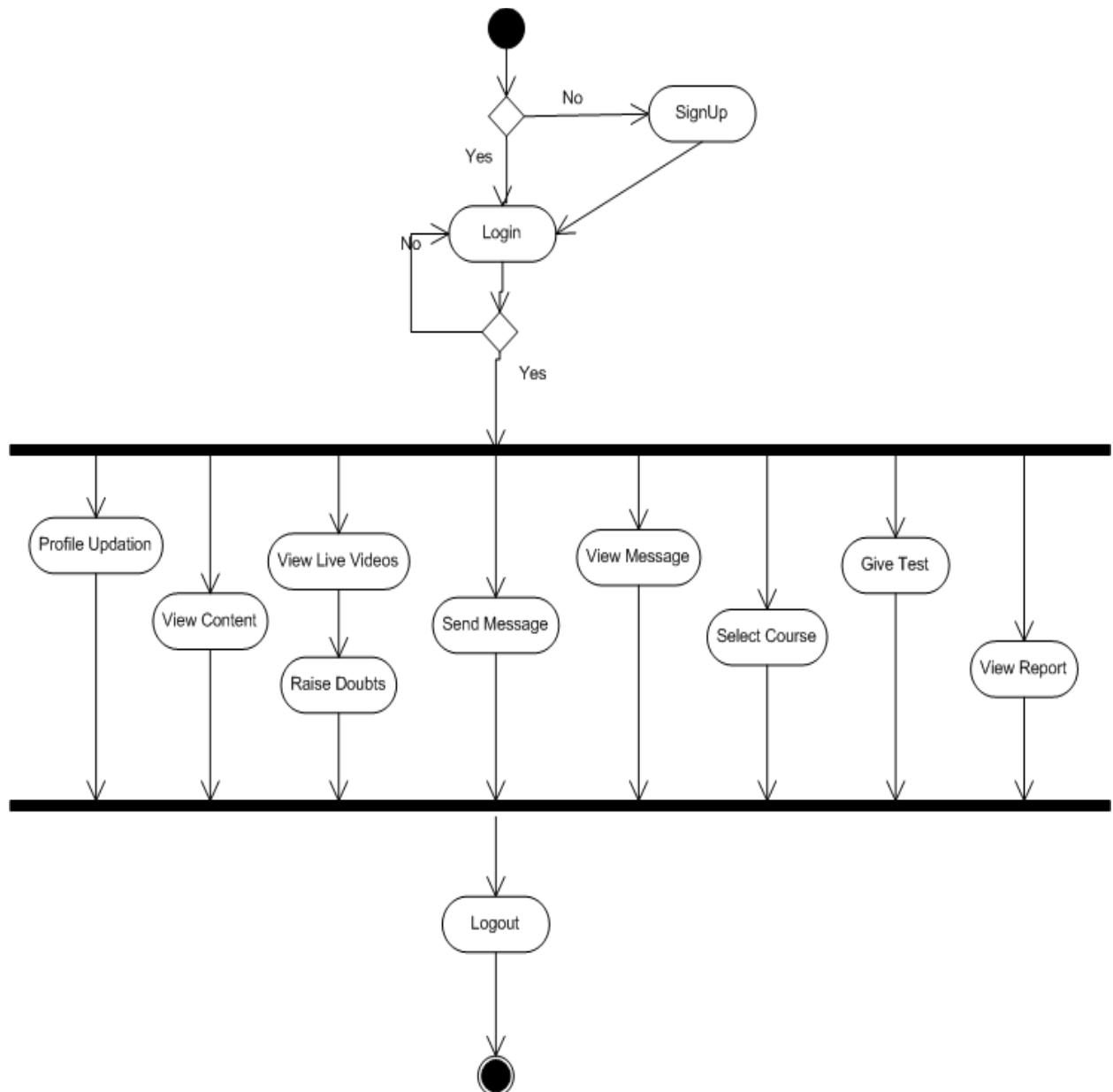
**3) Admin***Figure 2.13- Admin State Diagram*

## 8.6 ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams are intended to model both computational and organisational processes (i.e. workflows). Activity diagrams show the overall flow of control.

### Symbol used:



**DIAGRAMS:****1) Student***Figure 2.14- Student Activity Diagram*

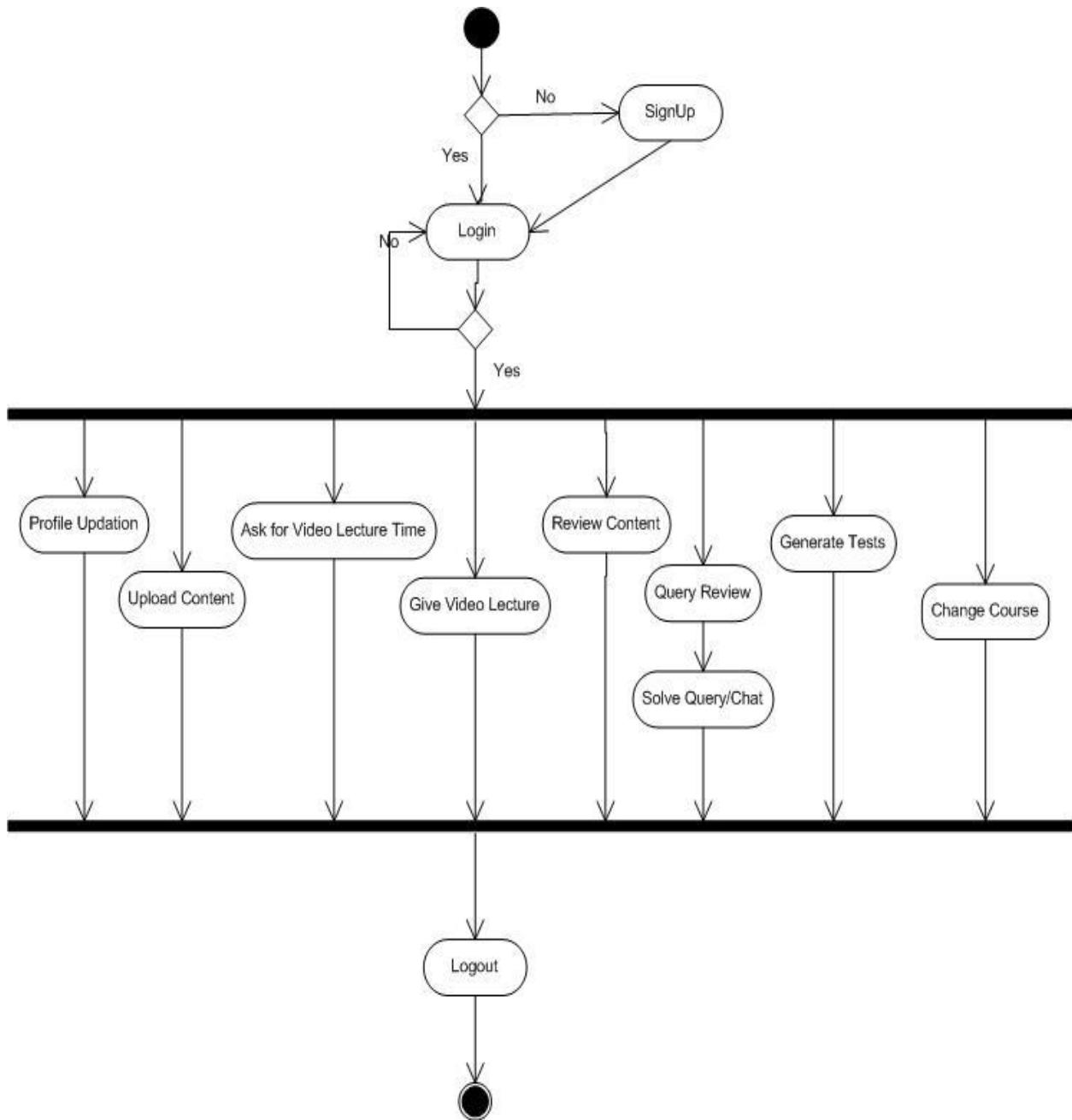
**2) Teacher**

Figure 2.15- Teacher Activity Diagram

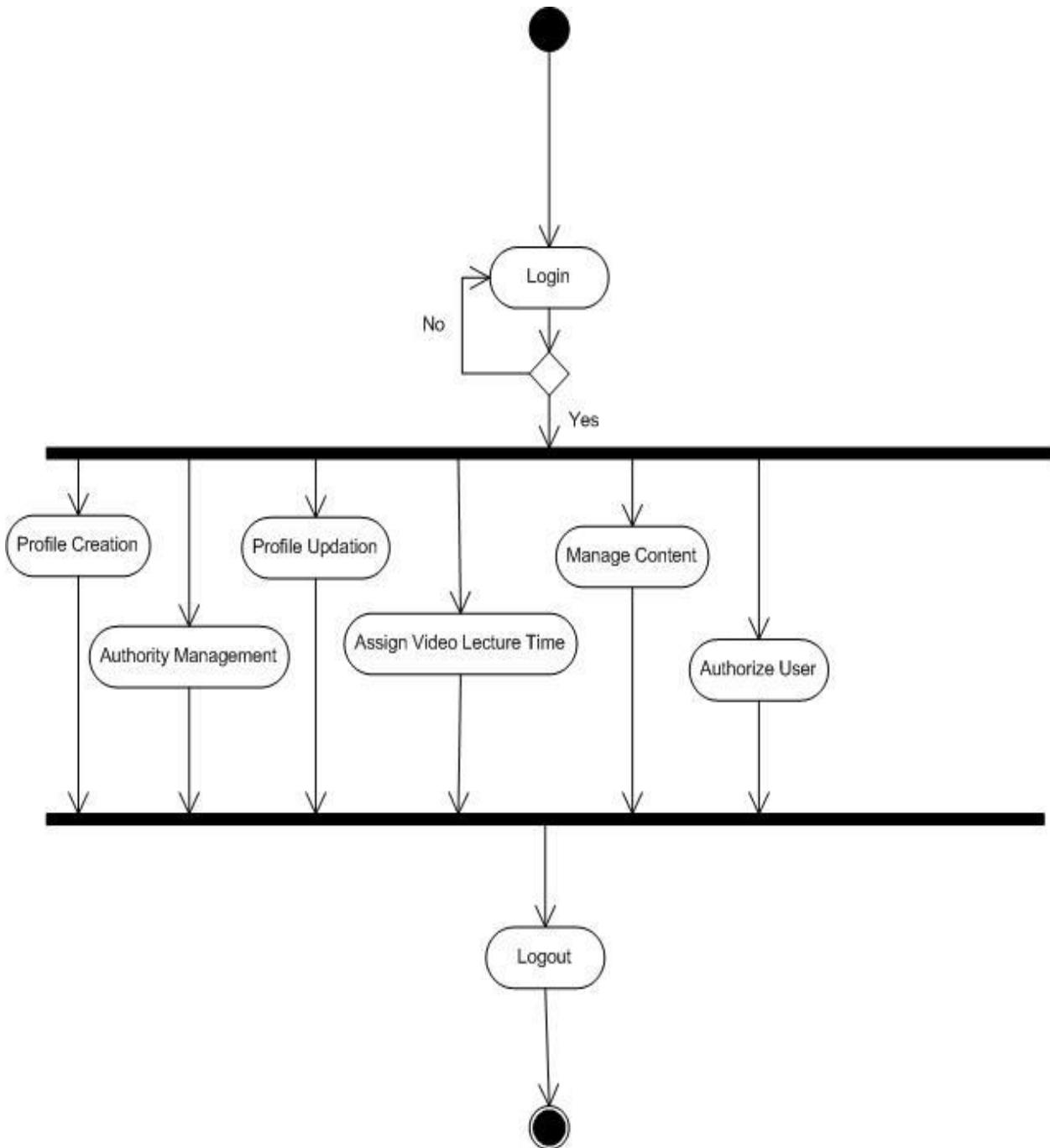
**3) Admin**

Figure 2.16- Admin Activity Diagram

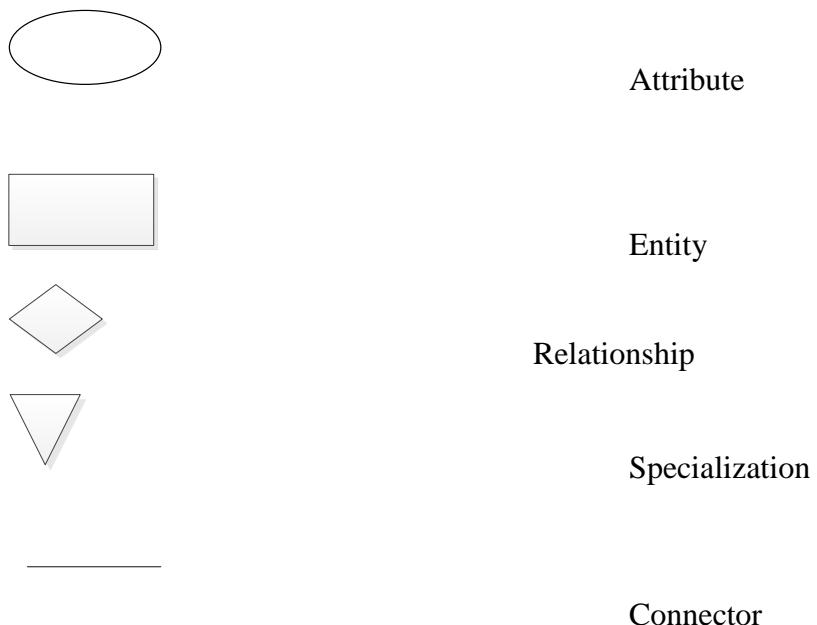
## 2.7 E-R DIAGRAM

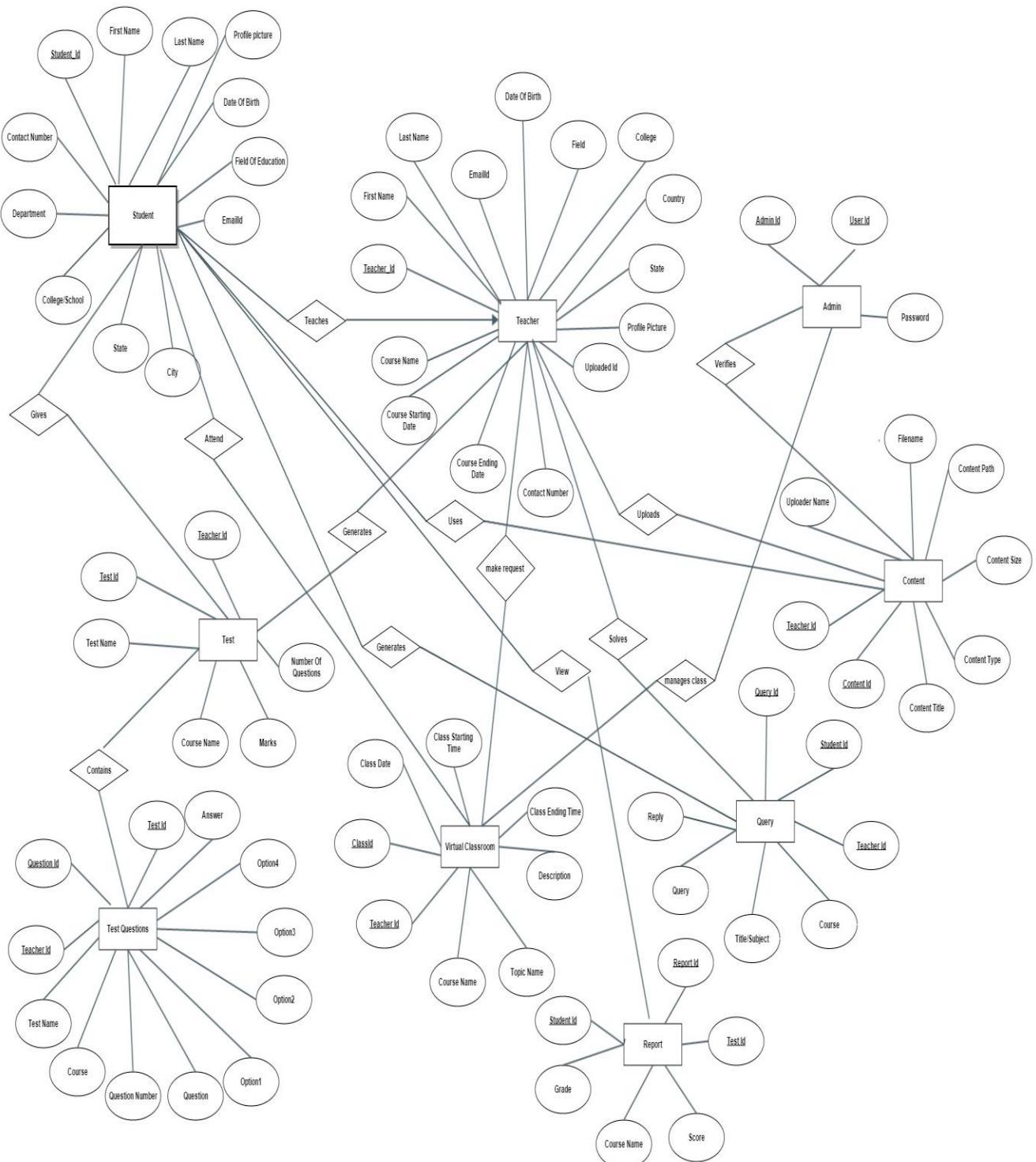
In software engineering, an **Entity – Relationship model (ER model)** for short) is an abstract way to describe a database. It usually starts with a relational database, which stores data in tables. Some of the data in these tables point to data in other tables - for instance, your entry in the database could point to several entries for each of the phone numbers that are yours. The ER model would say that you are an entity, and each phone number is an entity, and the relationship between you and the phone numbers is 'has a phone number'. Diagrams created to design these entities and relationships are called **entity–relationship diagrams or ER**.

There are three major abstractions to describe data.

- ❖ **Entities:** They are distinct things in the enterprise.
- ❖ **Attributes:** They are meaningful instruction between objects.
- ❖ **Relationship:** They are properties of entities and relationships.

### Symbol used:



**DIAGRAM:***Figure 2.17- ER Diagram for Virtual Classroom*

## 2.8 DATA DICTIONARY

<b>StudentMaster</b>				
<b>Sr.no</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Constraint</b>	<b>Description</b>
1	<u>Student_id</u>	Int	<b>Primary Key</b>	Uniquely identifies student
2	First Name	Varchar(50)		Describes first name of student
3	Last Name	Varchar(50)		Describes last name of student
4	Date of Birth	DateTime		Describes birth date of student
5	Gender	Varchar(50)		Describes student's gender
6	Email_Id	Varchar(50)		Describes Email_Id of student
7	Password	Varchar(50)		Describes Password of student
8	Confirm_Password	Varchar(50)		Confirms the password
9	Contact Number	Int		Describes contact number of student
10	Profile Picture	Varchar(500)		Represents profile picture of student
11	Country	Varchar(50)		Describes country of student
12	City	Varchar(50)		Describes the current city of the student
13	State	Varchar(50)		Describes the state of the student
14	Field of Education	Varchar(50)		Describes about the field of education of the student
15	School/College	Varchar(50)		Describes about the current school/college where student is

				studying
16	filename	Varchar(50)		Specifies the path of the file.
17	Course	Varchar(50)		Describes the course student has opted for

Table 2- Student Sign-up Table

TeacherMaster				
Sr.no	Column Name	Data Type	Constraint	Description
1	<u>Teacher id</u>	Int	<b>Primary Key</b>	Uniquely identifies teacher
2	First Name	Varchar(50)		Describes first name of teacher
3	Last Name	Varchar(50)		Describes last name of teacher
4	Date of Birth	DateTime		Describes birth date of teacher
5	Gender	Varchar(50)		Describes about the gender of the teacher
6	Email_Id	Varchar(50)		Describes Email_Id of teacher
7	Password	Varchar(50)		Describes Password of teacher
8	Confirm_Password	Varchar(50)		Confirms the password
9	Contact Number	Int		Describes contact number of teacher
10	Country	Varchar(50)		Describes country of teacher
11	City	Varchar(50)		Describes the current city of the student
12	State	Varchar(50)		Describes the state of the student
13	College	Varchar(50)		Describes the

				current college or school where teacher is teaching
14	Field	Varchar(50)		Describes field of teaching for teacher
15	UploadId	Varchar(500)		Mentions the teacher id
16	fileid	Varchar(50)		Describes the path of teacher's ID
17	Profilepic	Varchar(500)		Mentions the teacher's profile picture
18	filename	Varchar(50)		Specifies the path of teacher's profile picture
19	Course	Varchar(50)		Describes the course teacher is teaching
20	CourseSDate	DateTime		Describes course starting date
21	CourseEDate	DateTime		Describes course ending date
22	CourseDesc	Varchar(1000)		Specifies course description
23	Course_cover	Varchar(500)		Describes the course cover picture
24	Course_filename	Varchar(50)		Specifies path of cover picture
25	Status	Boolean		Describes the status of teacher approval by admin

*Table 3- Teacher Sign-Up Table*

<b>Adminmaster</b>				
<b>Sr.no</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Constraint</b>	<b>Description</b>
1	<u>Admin Id</u>	Int	<b>Primary Key</b>	This defines unique id given for admin
2	Username	Varchar(50)		This defines admin username
3	Password	Varchar(50)		Describes Password of teacher

Table 4- Admin Login Table

<b>Content</b>				
<b>Sr.no</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Constraint</b>	<b>Description</b>
1	<u>Content Id</u>	Int	<b>Primary key</b>	This defines unique id given for content
2	<u>TeacherID</u>	Varchar(50)		Defines the id of teacher who has uploaded the content
3	<u>Teacher</u>	Varchar(50)		Defines the firstnam of teacher who has uploaded the content
4	Content Type	Varchar(50)		This defines the type of the content
5	Course	Varchar(50)		This defines name given for course
6	Content_Title	Varchar(50)		This defines the title of actual content
7	Content_Size	Varchar(50)		This defines the size of the content
8	Content_Path	Varchar(100)		This defines the path of the content
9	Filename	Varchar(5000)		The absolute path of file

10	Description	Varchar(1000)		The description of the content uploaded
11	Status	Boolean		Describes the status of content approval by admin

*Table 5- Offline Content Table*

Query				
Sr.no	Column Name	Data Type	Constraint	Description
1	<u>QueryId</u>	Int	<b>Primary key</b>	This is to uniquely identify the message
2	StudentId	Int	<b>Foreign key</b>	Uniquely identifies sender(student)
3	TeacherId	Int	<b>Foreign key</b>	Uniquely identifies receiver(teacher)
4	Course	Varchar(50)		This defines unique name given for course
5	Title	Varchar(50)		Describes the title of query to be sent
6	Query	Varchar(50)		The actual query to be posted by student
7	Reply	Varchar(50)		The reply sent by the teacher to the student

*Table 6- Ask Query Table*

<b>Test</b>				
<b>Sr.no</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Constraint</b>	<b>Description</b>
1	Test Id	Int	<b>Primary key</b>	This is to uniquely identify the test
2	Course	Varchar(50)		This define unique course name
3	TeacherID	int	<b>FOREIGN KEY</b>	This defines teacher's id who has generated the test
4	Marks	Int		This defines the total marks of the test
5	Times	Varchar(50)		This defines the total time given to attend a single question
6	TestName	Varchar(50)		This defines unique name given to the test.

*Table 7- Test Generation Table*

<b>TestQuestion</b>				
<b>Sr.no</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Constraint</b>	<b>Description</b>
1	QuestionId	Int	<b>Primary Key</b>	This defines a unique id for each question
2	<u>Test Id</u>	Int		This is to uniquely identify the test
3	Course	Varchar(50)	<b>Foreign key</b>	This defines unique name given for course
4	TeacherID	Int	<b>Foreign Key</b>	This defines a unique id for the teacher
5	Question No	Int		Defines the question number of the question of a

				particular test
6	Question	Varchar(50)		This defines the question
7	Option1	Varchar(50)		Defines the 1 <sup>st</sup> option of the question
8	Option2	Varchar(50)		Defines the 2 <sup>nd</sup> option of the question
9	Option3	Varchar(50)		Defines the 3 <sup>rd</sup> option of the question
10	Option4	Varchar(50)		Defines the 4 <sup>th</sup> option of the question
11	Answer	Varchar(50)		Defines the correct answer out of the four options.

Table 8- Test Question Table

CheckTestGiven				
Sr.no	Column Name	Data Type	Constraint	Description
1	CheckTestId	int	Primary key	This is to uniquely identify the check test
2	Test Id	Int	Foreign Key	Test for which the report is generated
3	StudentId	int	Foreign Key	This uniquely identifies the student who has given a test
4	TestName	Varchar(50)		This defines the test name
5	isGiven	Boolean		Determines if the test is given or not by the student
4	Score	Int		Defines score secured in given test

Table 9-Check Test Given Table

<b>Take Virtual class</b>				
<b>Sr.no</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Constraint</b>	<b>Description</b>
1	<u>Virtual class Id</u>	Int	<b>Primary key</b>	This is to uniquely identify the virtual class
2	Teacher Id	Int	<b>Foreign key</b>	Defines id of teacher who is going to take the class
3	Course	Varchar(50)	<b>Foreign key</b>	Defines the name of course for which class is organised
4	Topic	Varchar(50)		Defines the topic of the virtual class
5	Description	Varchar(500)		Defines the description of the virtual class to be taken
6	Classdate	DateTime		Defines the date at which class is organised.
7	ClassSTime	DateTime		Define the time at which the class will start
8	ClassETime	DateTime		Defines the time at which class will end
9	Status	Boolean		Defines the status of approval of class by the admin

*Table 10- Take Virtual Class Table*

## 2.9 CANVAS

### 2.9.1 IDEATION CANVAS

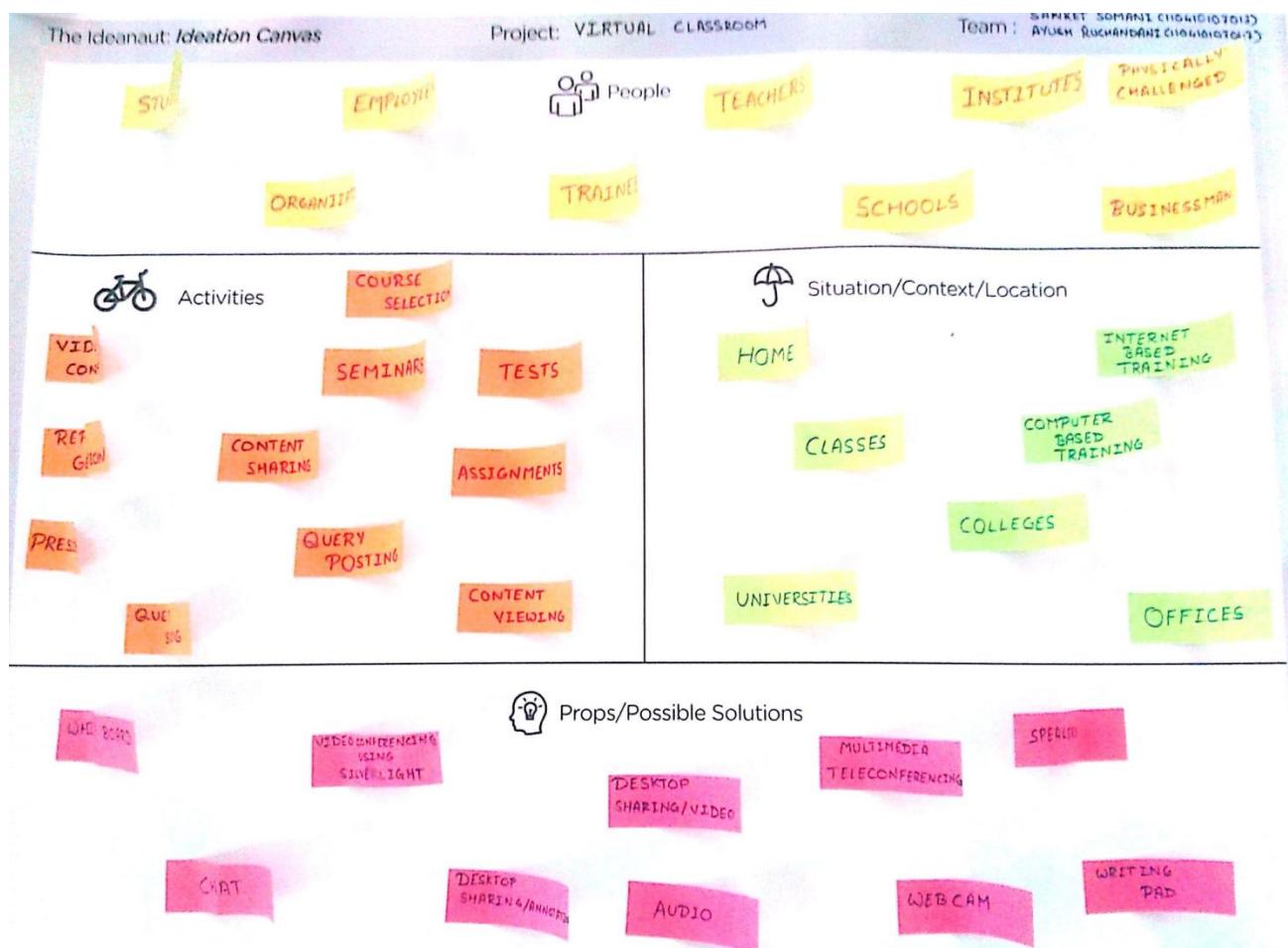
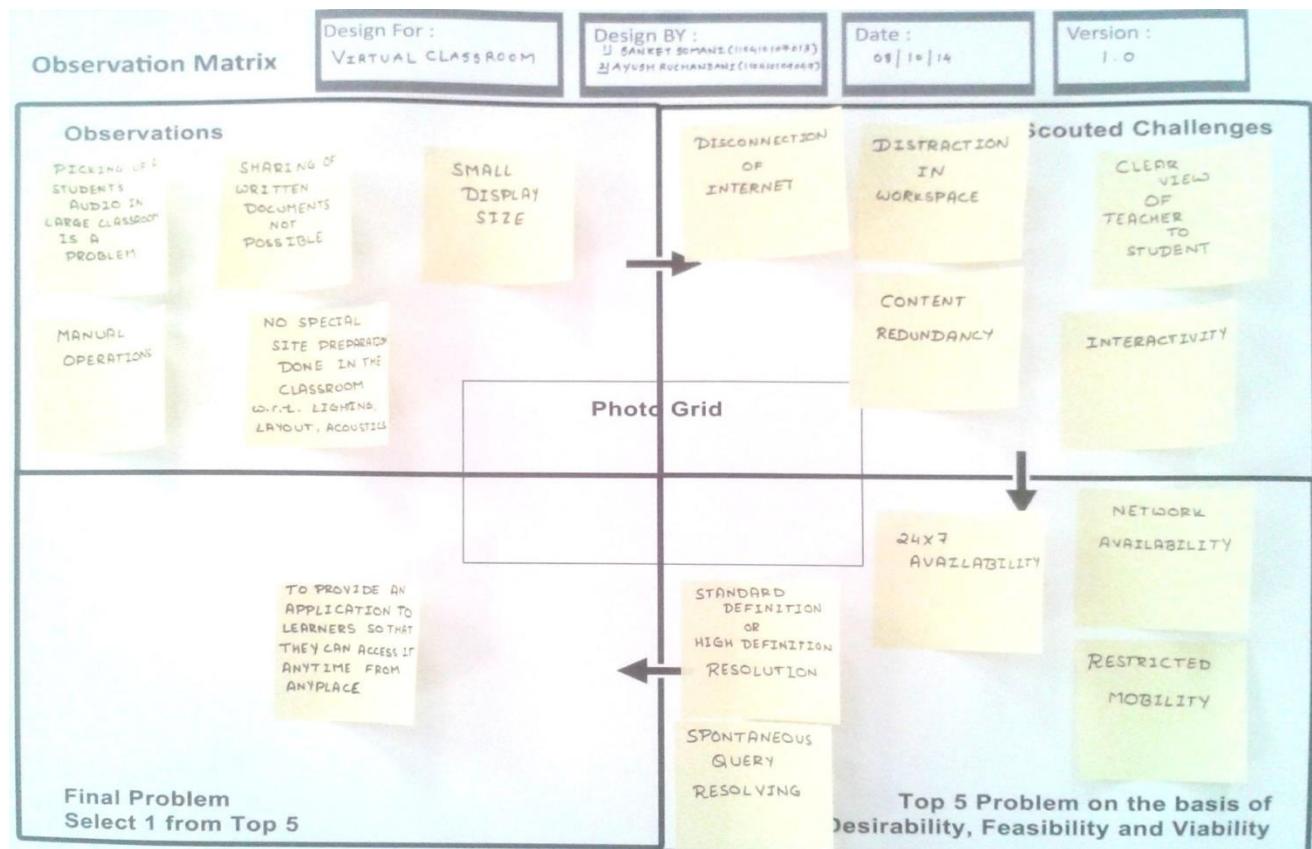


Figure 2.18- Ideation Canvas

## 2.9.2 OBSERVATION MATRIX

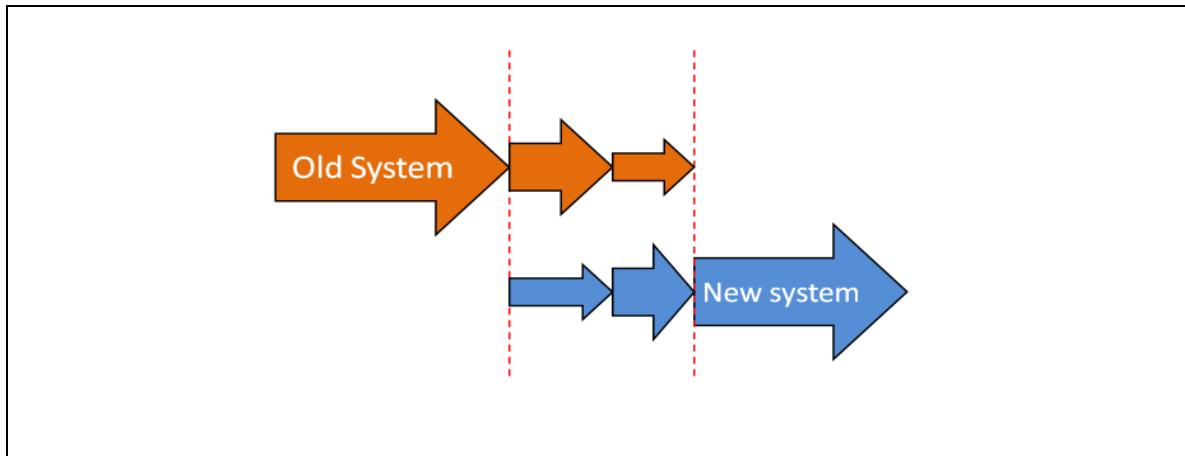


*Figure 2.19- Observation Matrix*

## 2.10 IMPLEMENTATION ENVIRONMENT

Without a solid implementation plan executed by an experienced team, even good software will probably fail to meet expectations. Only when the implementation team has gone through a similar process within a construction company can the experience be complete.

First-hand familiarity with the general workflow requirements of a construction business prepares the team to better guide the customer through a phased implementation process designed to save the company time and money. Our implementation methodology is Phased Implementation.



*Figure 2.20-Phase Implementation*

Phased implementation is a changeover process that takes place in stages. In our system implementation, firstly the system will handle certain small and less risky projects and other projects will be handled using old system. So that if the system fails risk can be minimized. Once system is working properly then the old system can be replaced with new system. The phased operation changeover method involves implementing the new system in stages, or modules. We can implement each subsystem by using any of the other three changeover methods. In this approach risk of errors or failures is limited to the implemented module only as well as it is less expensive than the full parallel operation.<sup>[13]</sup>

### **2.10.1 ADVANTAGES**

- As we know in this method we have to implement the new system in stages, or modules, which is less prone to risk of system failure or errors at health centres, as failure is limited to the implemented module only.
- It is also less expensive than parallel system because we have to work only with one part of system at a time.

**SYSTEM IMPLEMENTATION****CHAPTER-3****3.1 SCREENSHOTS****3.1.1 HOME AND REGISTRATION SCREENSHOTS**

*Figure 3.1–Home Page*

The screenshot shows the first part of the student registration form. At the top, there is a header with the 'Virtual Classroom' logo and a Wipro logo. Below the header, a navigation bar includes links for Home, Courses, About-Us, and Contact-Us. A welcome message 'Welcome Student, Please Enter Your Details.' is displayed. The form consists of several input fields: 'Enter First Name:' (text), 'First Name' (text), 'Enter Last Name:' (text), 'Last Name' (text), 'Enter Date-Of-Birth:' (text), 'dd/mm/yyyy' (text), 'Gender:' (text), 'Male' (radio button), 'Female' (radio button), 'Enter E-mail Id:' (text), 'E-Mail Id' (text), 'Enter Password:' (text), 'Password' (text), 'Confirm Password:' (text), 'Confirm Password' (text), and 'Enter Contact Number:' (text), 'Contact Number' (text). A note at the bottom left states 'All Fields marked in \* are compulsory'.

Figure 3.2—Student Registration Page(1)

The screenshot shows the second part of the student registration form. It includes fields for 'Enter Contact Number:' (text), 'Address' (text), 'Enter State:' (text), 'State' (text), 'Enter City:' (text), 'City' (text), 'Enter your Field:' (text), a dropdown menu currently set to 'Computer Engineering', 'Select Course:' (text), a dropdown menu currently set to 'Android Programming' with a link to 'View Available Courses', 'Enter University/College:' (text), and a file upload field for 'Upload Profile Photo' with the instruction '(you can upload your profile picture less than 500 kb)'. Below the file upload field, it says 'No Image Uploaded' and has a 'Choose file' button. At the bottom right are 'Submit' and 'Reset' buttons. A copyright notice '© Untitled. All rights reserved.' is at the very bottom.

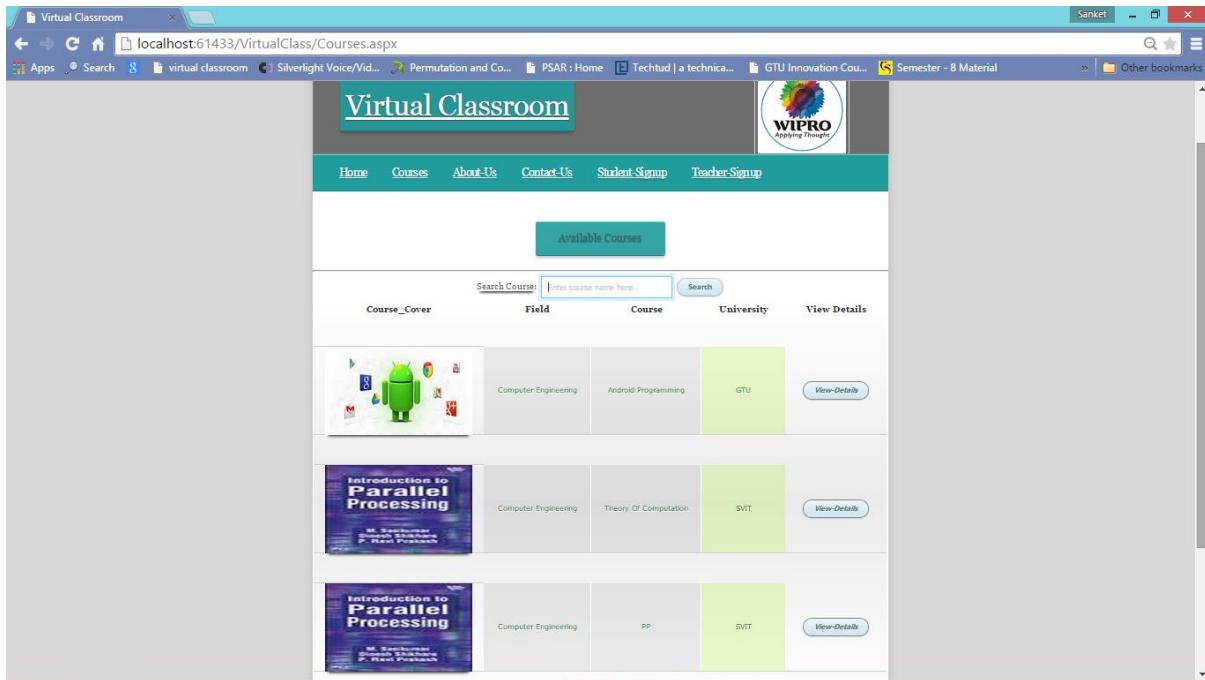
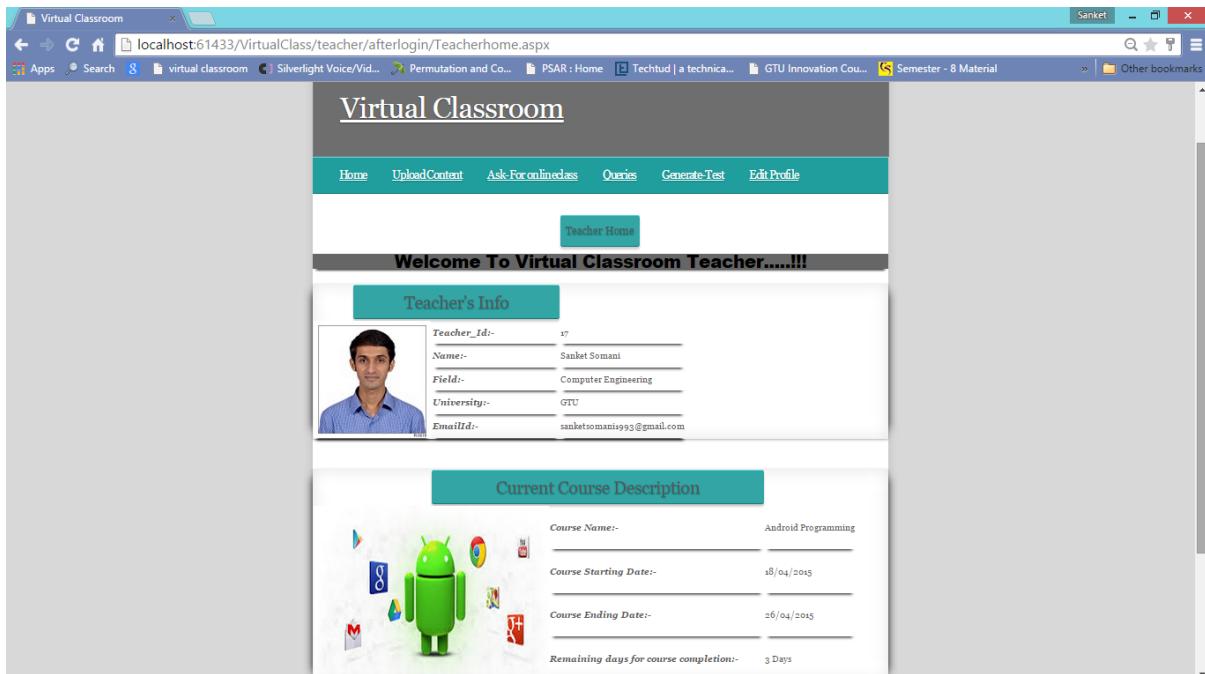
Figure 3.3—Student Registration Page(2)

This screenshot shows the first part of the teacher registration form. It includes fields for First Name, Last Name, Date of Birth, Gender (with radio buttons for Male and Female), Email ID, Password, Confirm Password, Contact Number, and State. A note at the top says "Welcome Teacher. Please Enter Your Details." and a note below it states "All Fields marked in \* are compulsory".

*Figure 3.4—Teacher Registration Page(1)*

This screenshot shows the second part of the teacher registration form. It includes fields for City, Field (with a dropdown menu showing "Computer Engineering"), Course Name, Course Start Date, Course End Date, Course Description (with a large text area), University/College (with a dropdown menu), and three file upload fields for Photo-ID, Profile Photo, and Course Cover. Each file upload field shows a message indicating no image has been uploaded yet.

*Figure 3.5—Teacher Registration Page(2)*

*Figure 3.6—Courses Available Page**Figure 3.7—Teacher Home Page after Login*

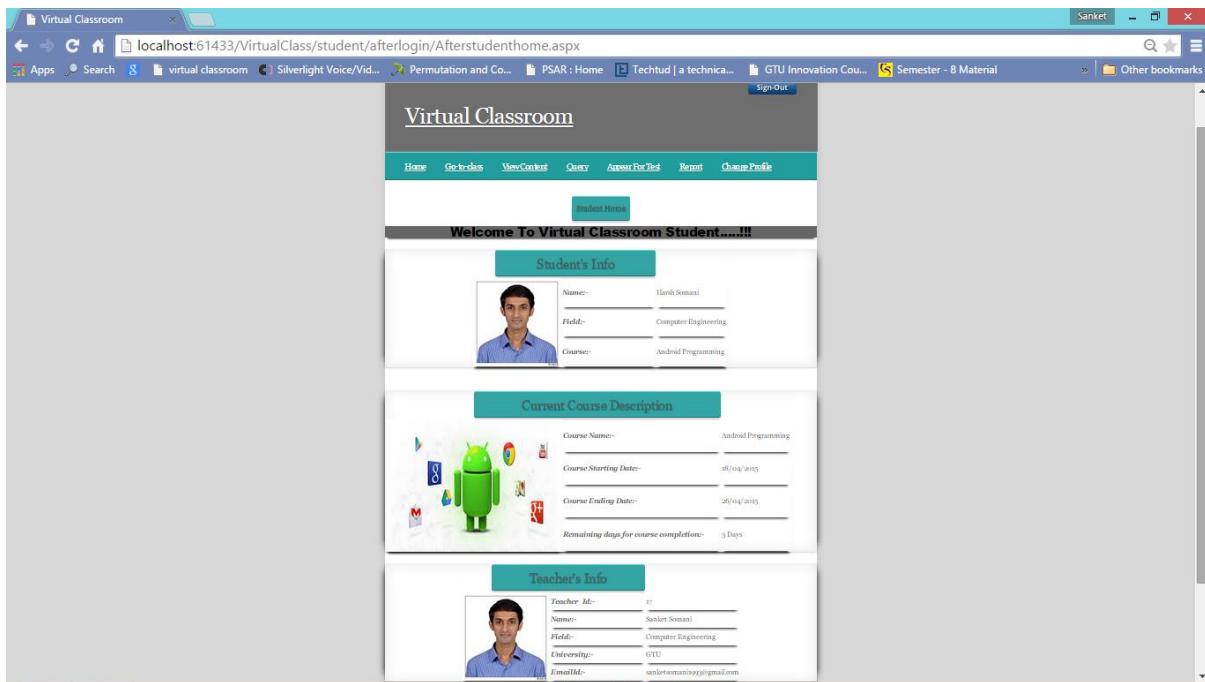


Figure 3.8—Student Home Page after Login

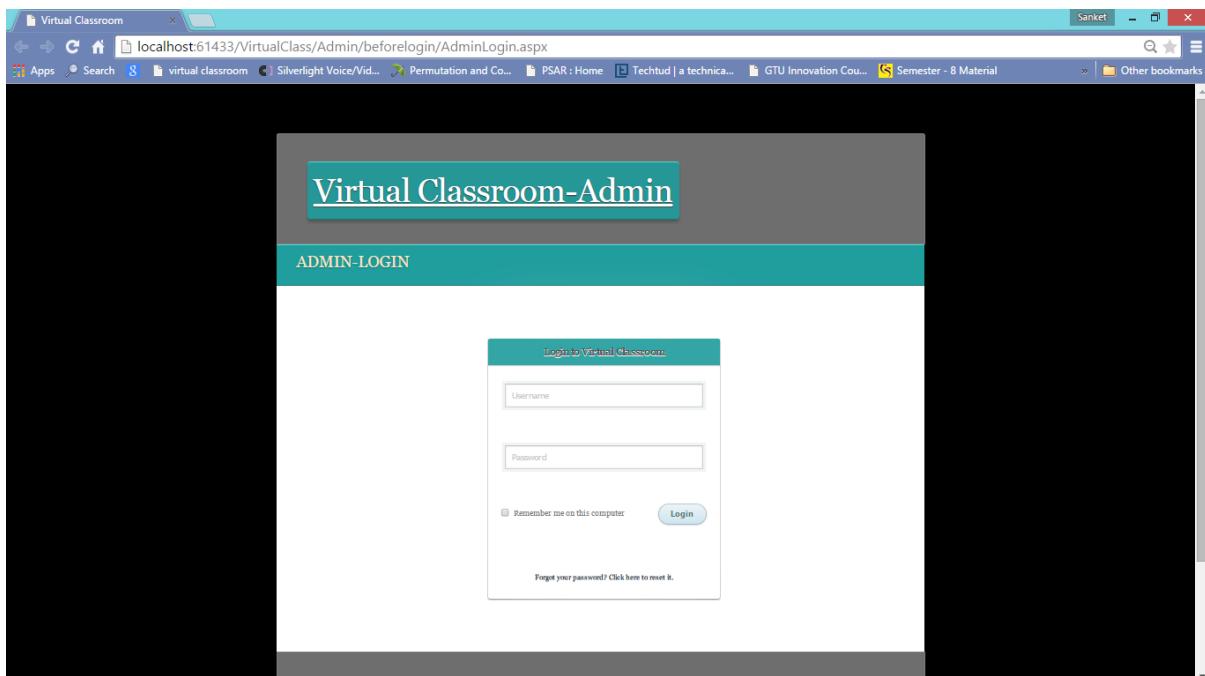


Figure 3.9—Admin Login Page

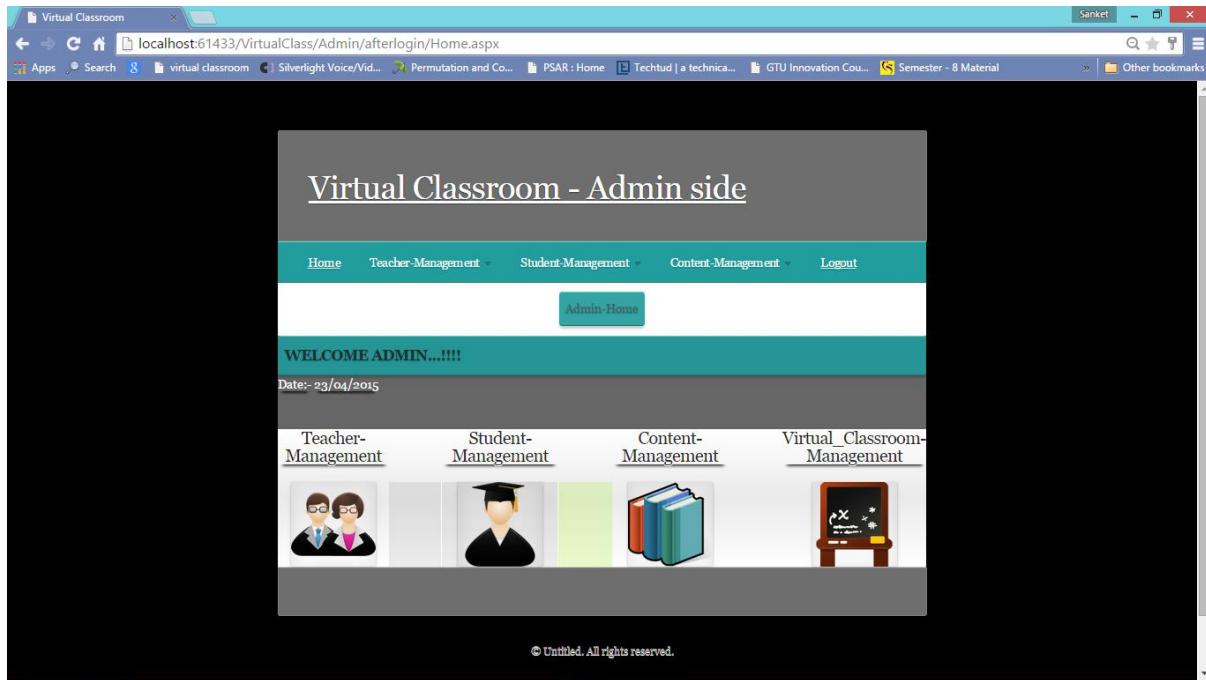
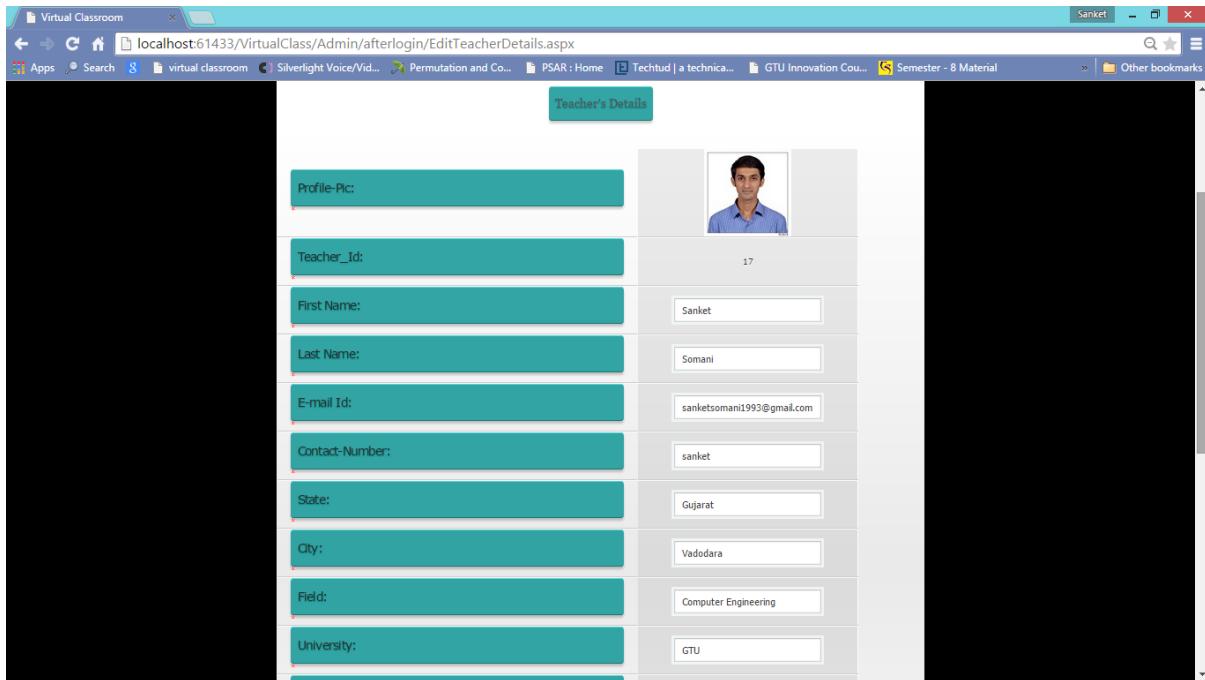


Figure 3.10—Admin Home Page after Login

Virtual Classroom - Admin side					
<a href="#">Home</a> <a href="#">Teacher-Management</a> ▾ <a href="#">Student-Management</a> ▾ <a href="#">Content-Management</a> ▾ <a href="#">Logout</a>					
Registered-Teachers					
Teacher_Id	Email_ID	Field	Course	Remove	View/Edit Details
17	sanketsoman1993@gmail.com	Computer Engineering	Android Programming	<a href="#">Delete-User</a>	<a href="#">View Details</a>
19	ayush.ruchandani@gmail.com	Computer Engineering	Theory Of Computation	<a href="#">Delete-User</a>	<a href="#">View Details</a>
20	ayush@ruchandani.com	Computer Engineering	PP	<a href="#">Delete-User</a>	<a href="#">View Details</a>

Figure 3.11—View and Approve Registered Teachers at Admin Side



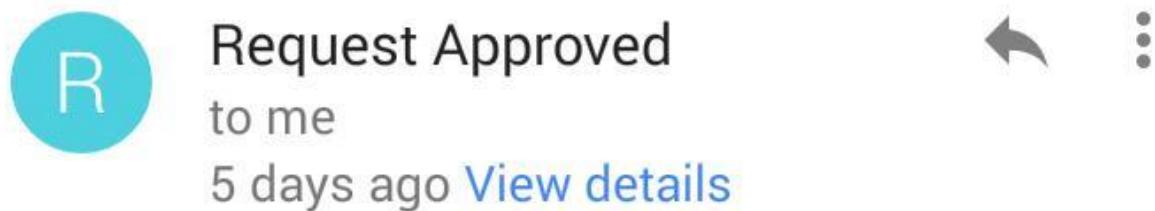
*Figure 3.12–Edit Teacher Details at Admin Side*

The screenshot shows a web application window titled 'Virtual Classroom - Admin side'. The URL is 'localhost:61433/VirtualClass/Admin/afterlogin/RegisteredStudent.aspx'. The page has a header with navigation links: Home, Teacher-Management, Student-Management, Content-Management, and Logout. Below the header is a section titled 'Registered-Students'. A table displays student information with the following data:

Student_Id	Email_ID	Field	Course	Remove	View/Edit Details
24	harshsomani1997@gmail.com	Computer Engineering	Android Programming	<a href="#">Delete-User</a>	<a href="#">View-Details</a>
25	ayush.ruchandani@gmail.com	Computer Engineering	Theory Of Computation	<a href="#">Delete-User</a>	<a href="#">View-Details</a>

At the bottom of the page, there is a copyright notice: © Untitled. All rights reserved.

*Figure 3.13–Registered Students Page at Admin Side*



Congratulations. Your Request has been approved.!!  
You can now login now using your user-name and  
password. User name is=[ayush@ruchandani.com](mailto:ayush@ruchandani.com) and  
your password is ayush

*Figure 3.14*—Email Received to Teacher after registration approval

### 3.1.2 CONTENT MANAGEMENT MODULE SCREENSHOTS

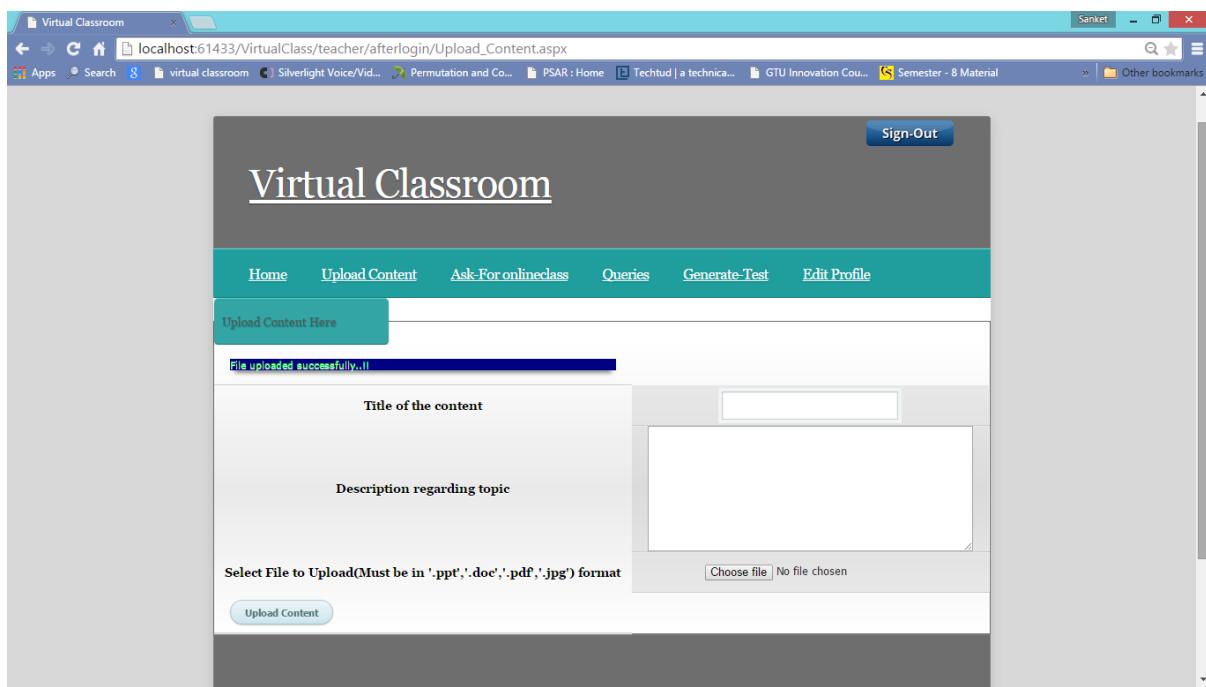


Figure 3.15 – Content Upload Page at teacher side.

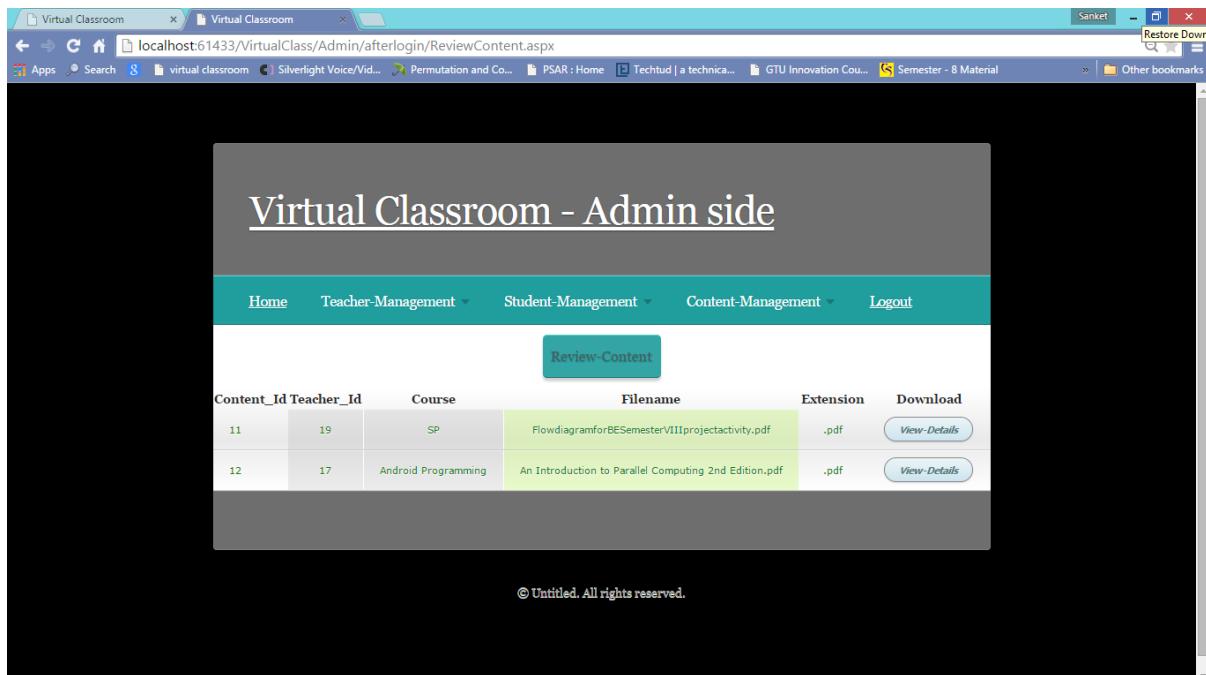
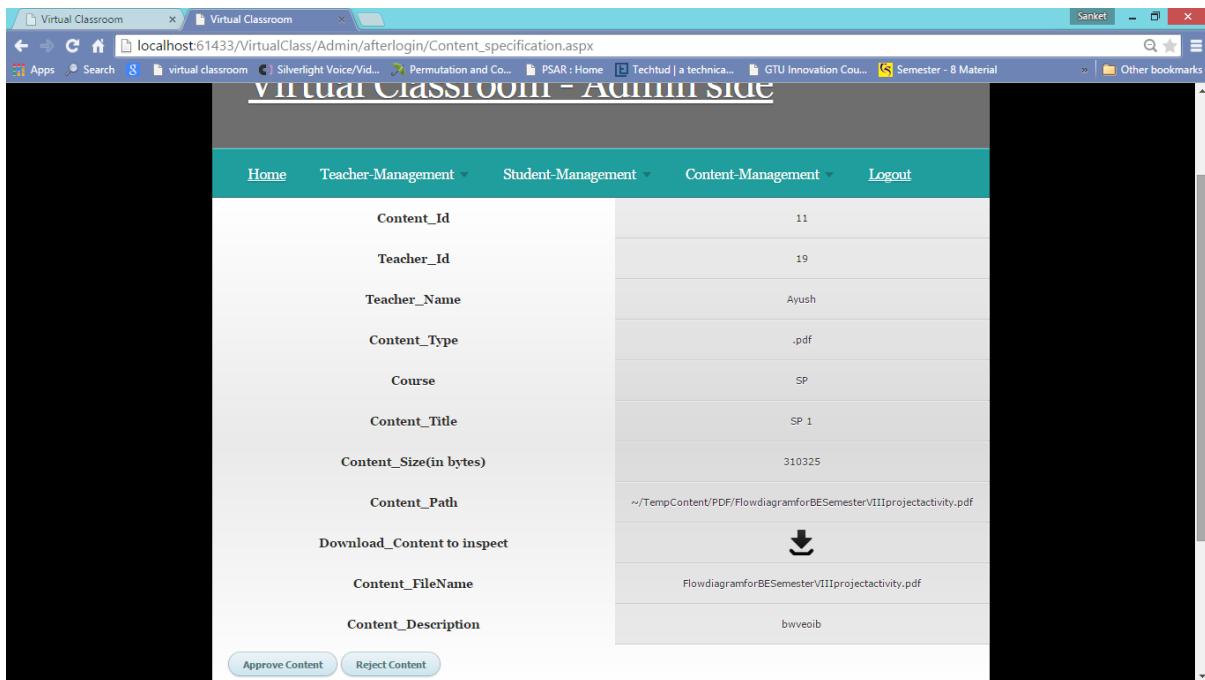
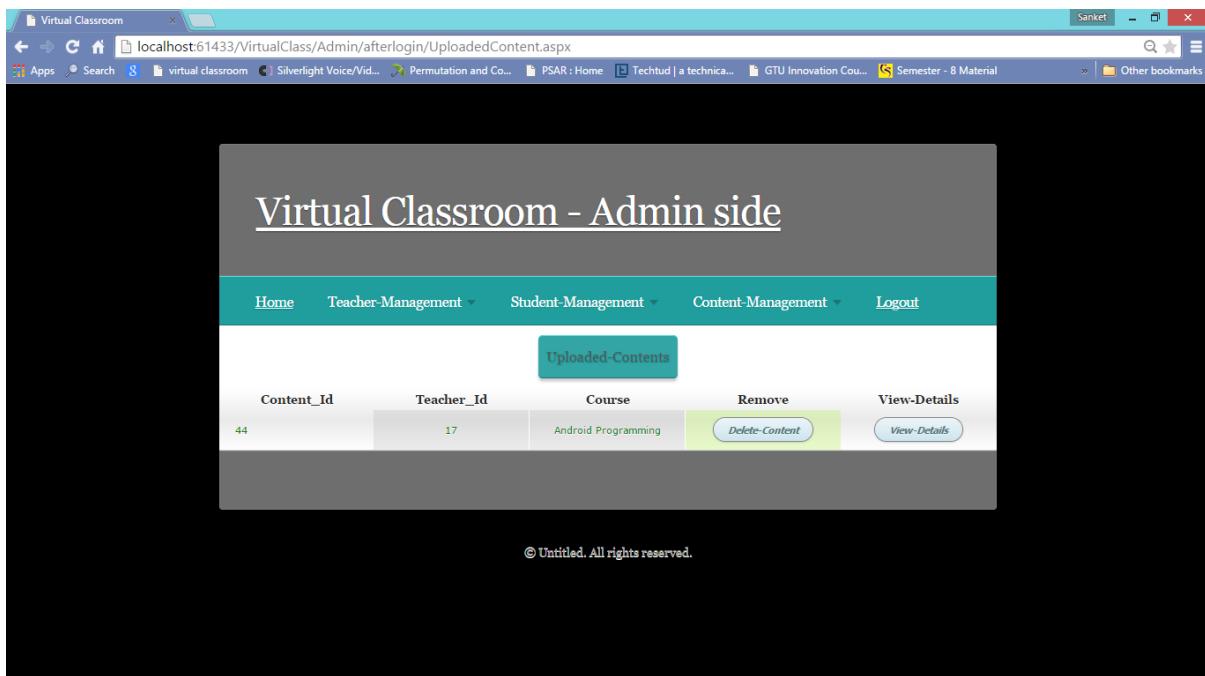


Figure 3.16–Content Approval Page at Admin Side



Content_Id	11
Teacher_Id	19
Teacher_Name	Ayush
Content_Type	.pdf
Course	SP
Content_Title	SP 1
Content_Size(in bytes)	310325
Content_Path	~/TempContent/PDF/FlowdiagramforBESemesterVIIiprojectactivity.pdf
Download_Content to inspect	
Content_FileName	FlowdiagramforBESemesterVIIiprojectactivity.pdf
Content_Description	bwveoib

*Figure 3.17–Content Description Page at Admin Side*


Uploaded-Contents				
Content_Id	Teacher_Id	Course	Remove	View-Details
44	17	Android Programming	<input type="button" value="Delete-Content"/>	<input type="button" value="View-Details"/>

© Untitled. All rights reserved.

*Figure 3.18–Uploaded Content Page at Admin Side*

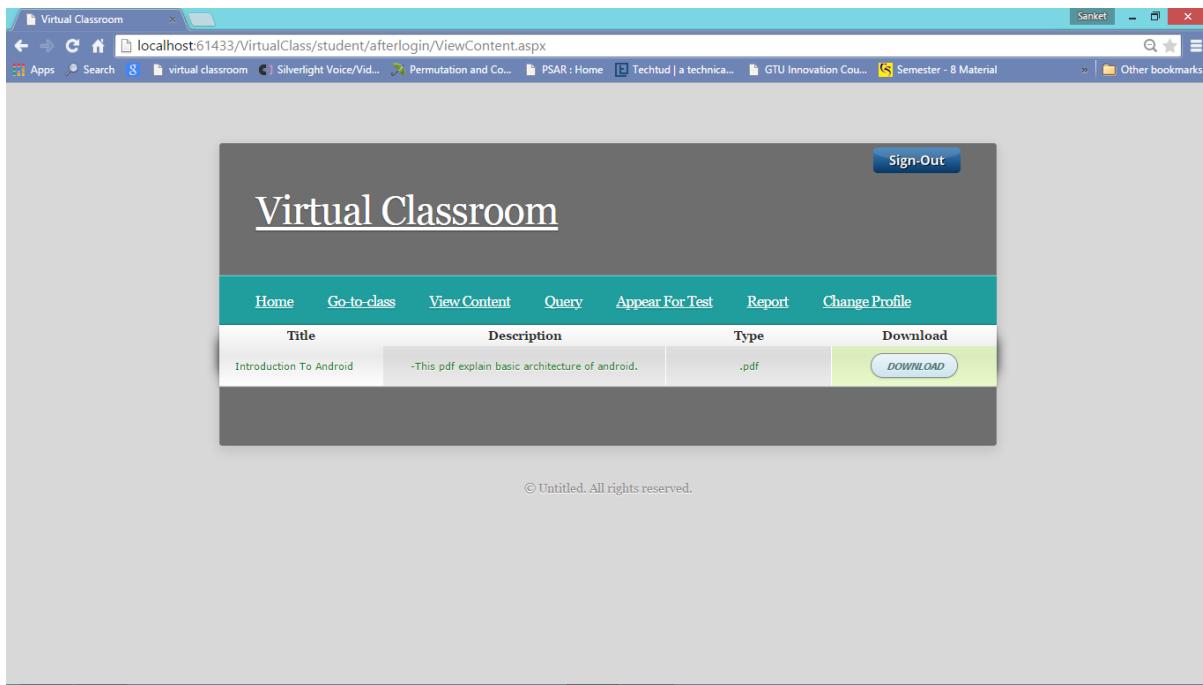
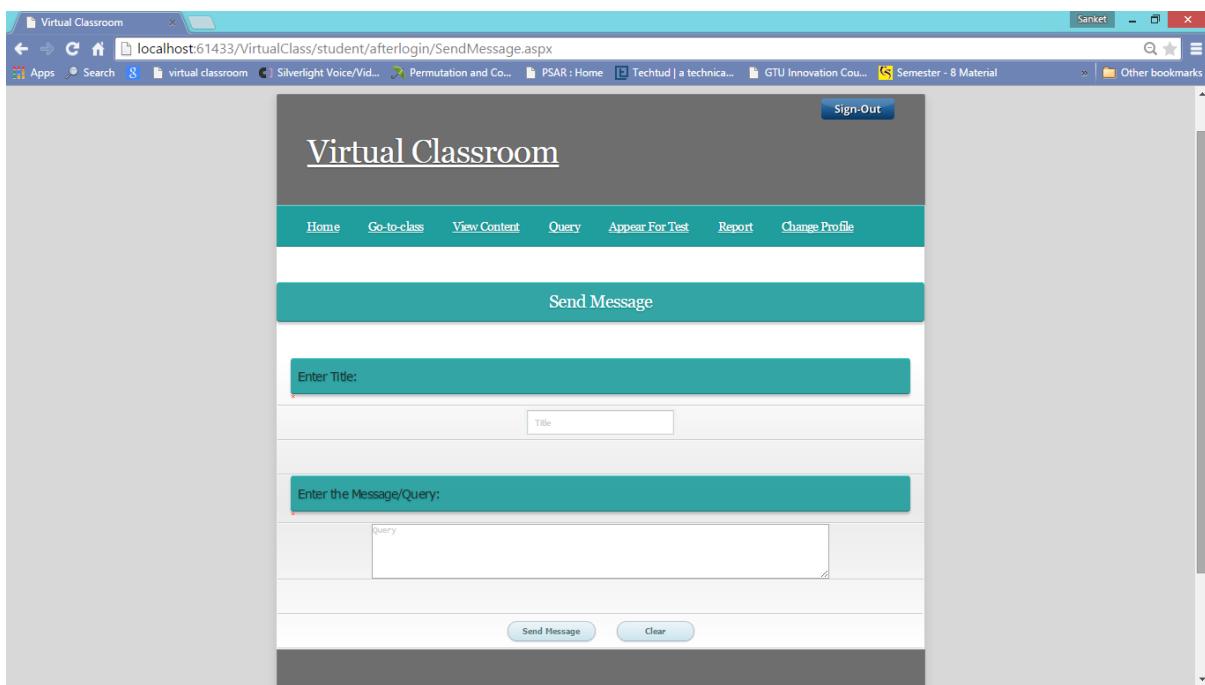
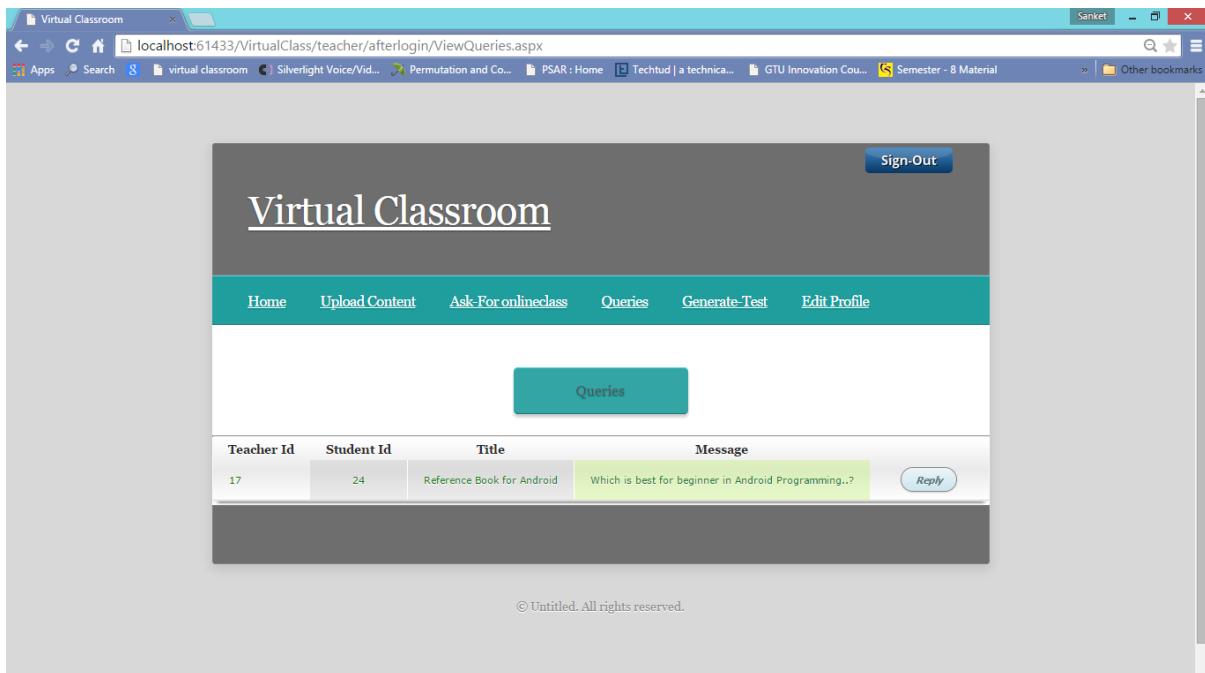


Figure 3.19– View and Download Content Page at Student Side

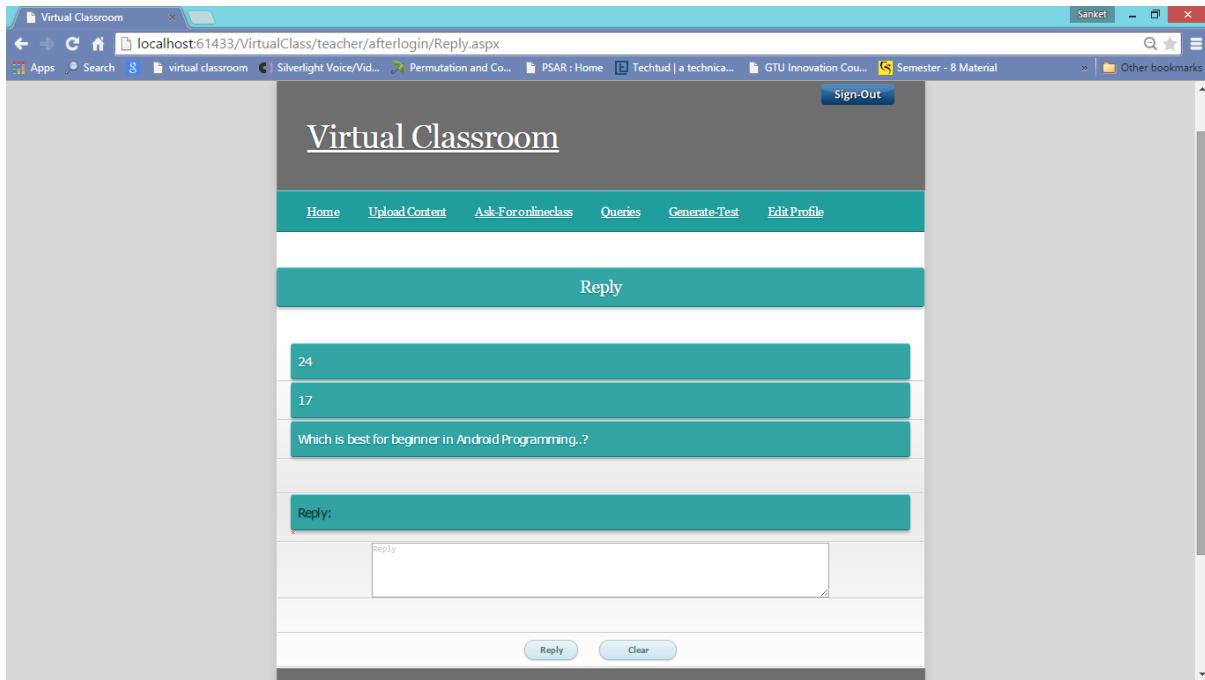
### 3.1.3 DOUBT SOLVING MODULE SCREENSHOTS



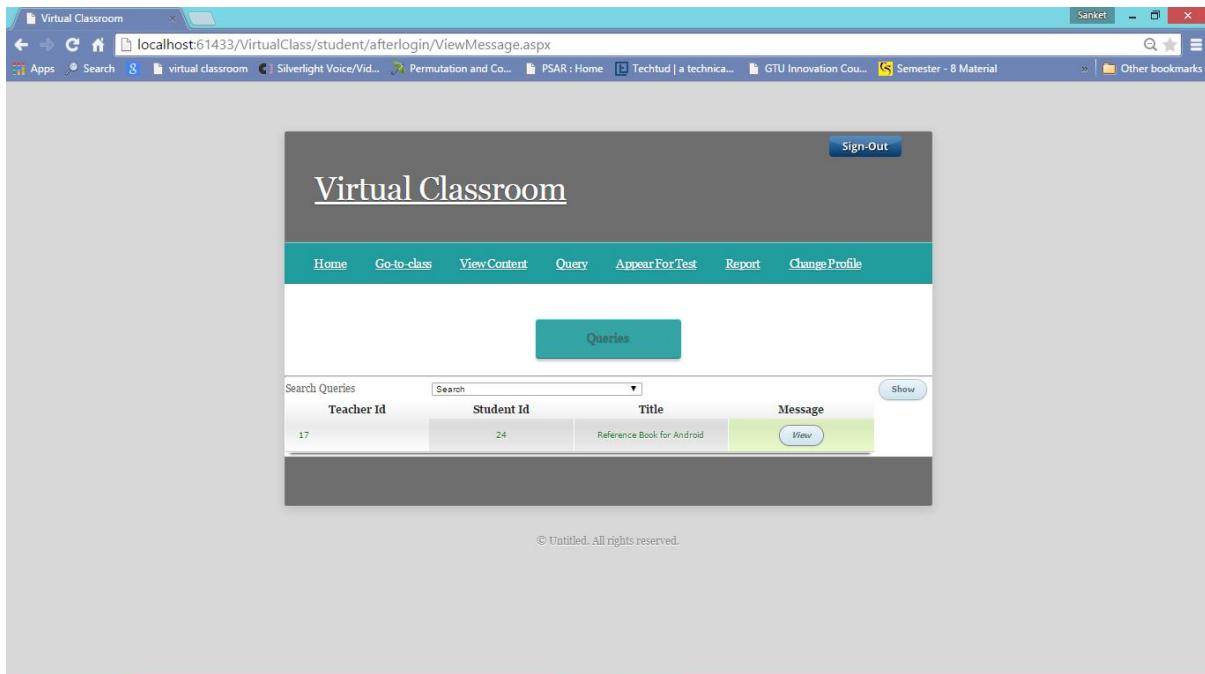
*Figure 3.20*—Query Posting Page at Student Side



*Figure 3.21*—View Posted Query Page at Teacher Side



*Figure 3.22–Query Reply Page at Teacher Side*



*Figure 3.23–View Posted Query Page at Student Side*

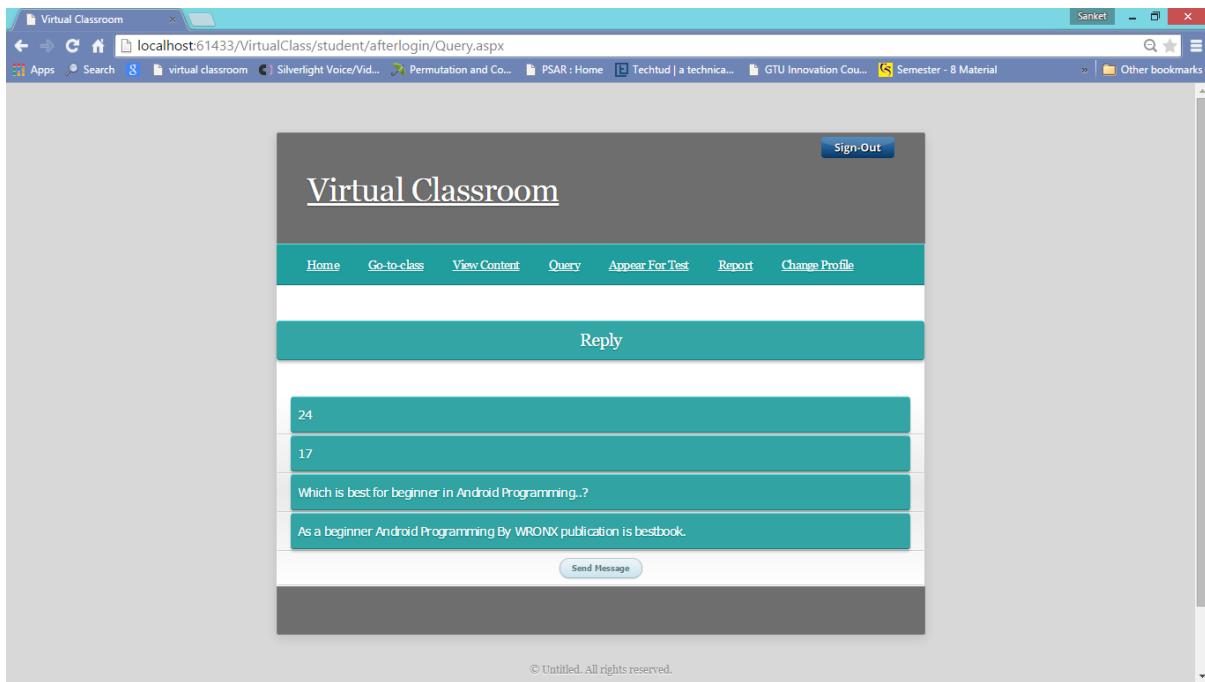


Figure 3.24—View Reply Page at Student Side

### 3.1.4 ONLINE CLASS MODULE SCREENSHOTS

The screenshot shows a web-based application window titled 'Virtual Classroom'. The URL in the address bar is 'localhost:61433/virtualClass/teacher/afterlogin/Ask\_For\_Onlineclass.aspx'. The main content area has a teal header bar with the title 'Request for Virtual-Class'. Below it, a message says 'Your request has been sent to Admin successfully...!!Check your reply on your registered EmailId...!!'. There are four input fields: 'Enter Topic Name:' with 'Android First Lecture' typed in, 'Enter Description:' with 'Android Architecture' typed in, 'Enter Date:' with '23/04/2015' typed in, and 'Enter start time:' with '10:00' typed in. Below these is an 'Enter end time:' field with '11:45' typed in. At the bottom right are two buttons: 'Send Request' and 'Clear'.

Figure 3.25—Ask for Online Class Page at Teacher Side

The screenshot shows a web-based application window titled 'Virtual Classroom - Admin side'. The URL in the address bar is 'localhost:61433/VirtualClass/Admin/afterlogin/ClassRequests.aspx'. The main content area has a teal header bar with the title 'Virtual Classroom - Admin side'. Below it, a navigation menu includes 'Home', 'Teacher-Management', 'Student-Management', 'Content-Management', and 'Logout'. A sub-menu 'Teacher-Classroom-Requests' is open. A table displays a single row of data:

Class_Id	Teacher_Id	Course	View-Details
18	17	Android Programming	<a href="#">View-Details</a>

At the bottom left, there is a copyright notice: '© Untitled. All rights reserved.'

Figure 3.26—Online Class Approval Page at Admin Side

The screenshot shows a web application window titled "Virtual Classroom". The URL in the address bar is "localhost:61433/VirtualClass/Admin/afterlogin/Class\_specification.aspx". The page has a top navigation bar with links for "Home", "Teacher-Management", "Student-Management", "Content-Management", and "Logout". Below this is a section titled "Classroom-Specification" containing a table with the following data:

Class_Id	18
Teacher_Id	17
Course_Name	Android Programming
Topic_Name	Android First Lecture
Topic Description	-Android Architecture
Date of class	2015-04-23
Class Starting Time	10:00
Class Ending Time	11:45
Total Duration of Session	01:45

At the bottom of the table are two buttons: "Approve Class Request" and "Reject Class Request".

Figure 3.27– Online Class Specification Page at Admin Side

The screenshot shows a web application window titled "Virtual Classroom - Admin side". The URL in the address bar is "localhost:61433/VirtualClass/Admin/afterlogin/ViewRegisteredClass.aspx". The page has a top navigation bar with links for "Home", "Teacher-Management", "Student-Management", "Content-Management", and "Logout". Below this is a section titled "Registered Classes" containing a table with the following data:

Class_Id	Teacher_Id	Course	View-Details
11	13	Android Programming	<a href="#">View-Details</a>
13	14	Java Programming	<a href="#">View-Details</a>
15	17	Android Programming	<a href="#">View-Details</a>

At the bottom of the page is a copyright notice: "© Untitled. All rights reserved."

Figure 3.28– Registered Online Class Page at Admin Side

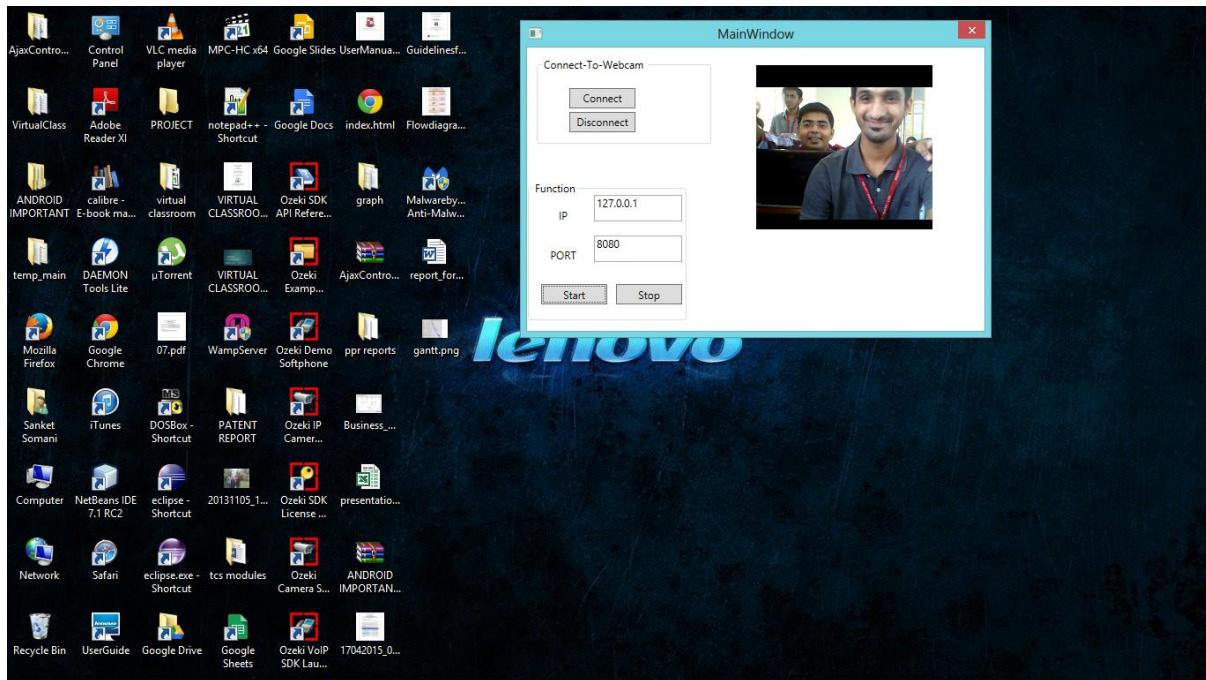


Figure 3.29—Teacher Side Online Class Console Application

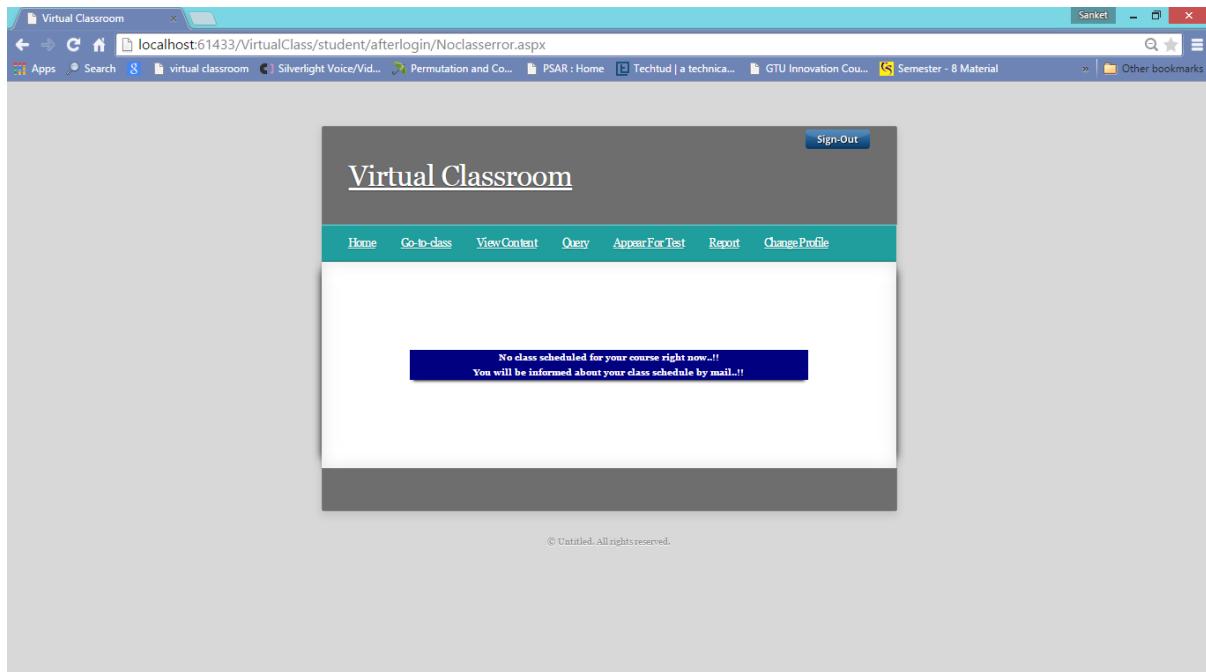
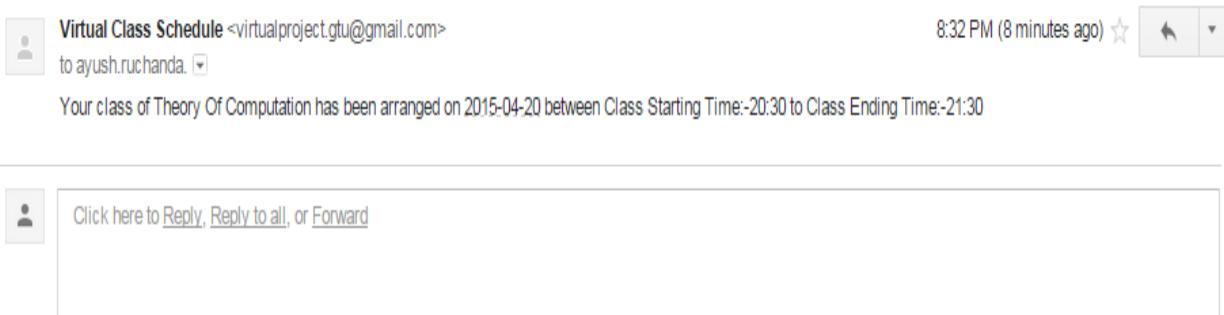
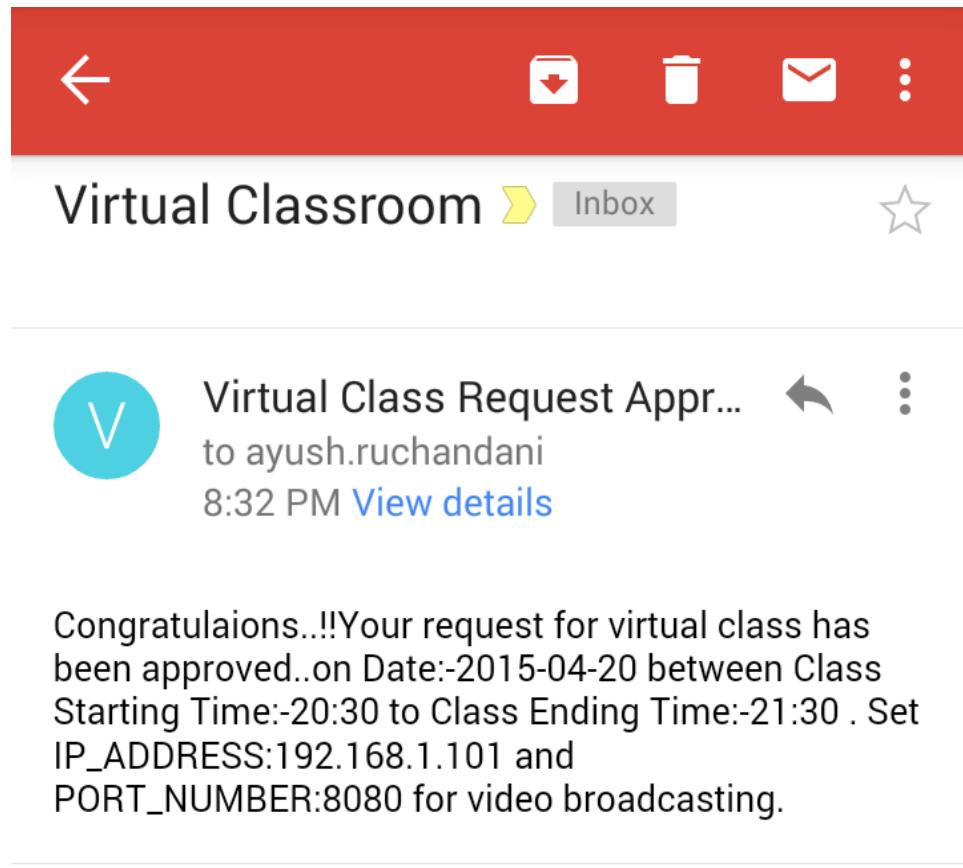


Figure 3.30—No Class Error Page at Student Side



*Figure 3.31*—Email Received to the Student about Online Class Schedule



*Figure 3.32*— Email Received to Teacher after Online Class approval

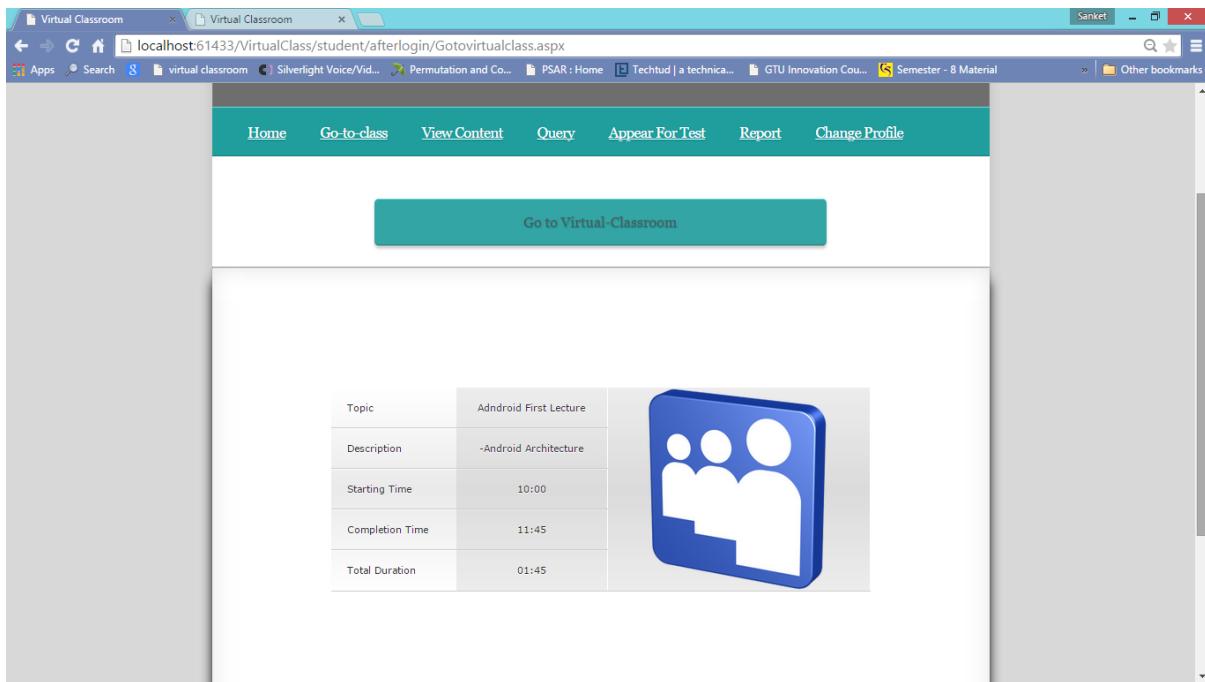


Figure 3.33–Online Class Page at Student Side

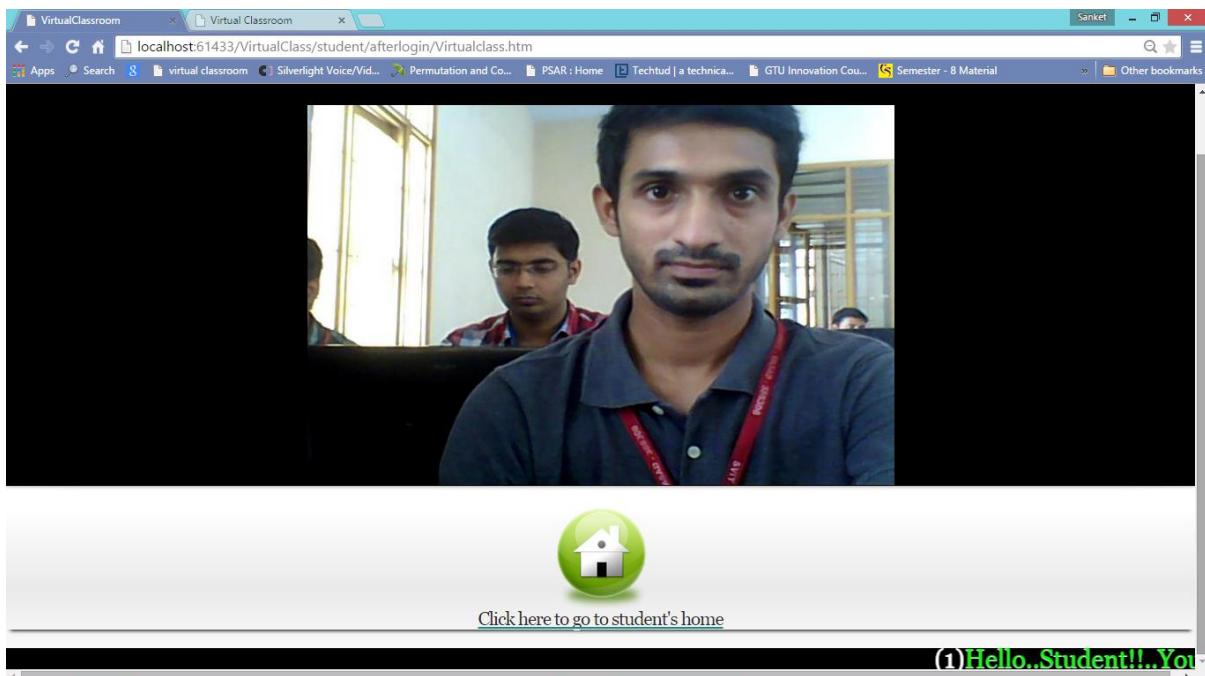
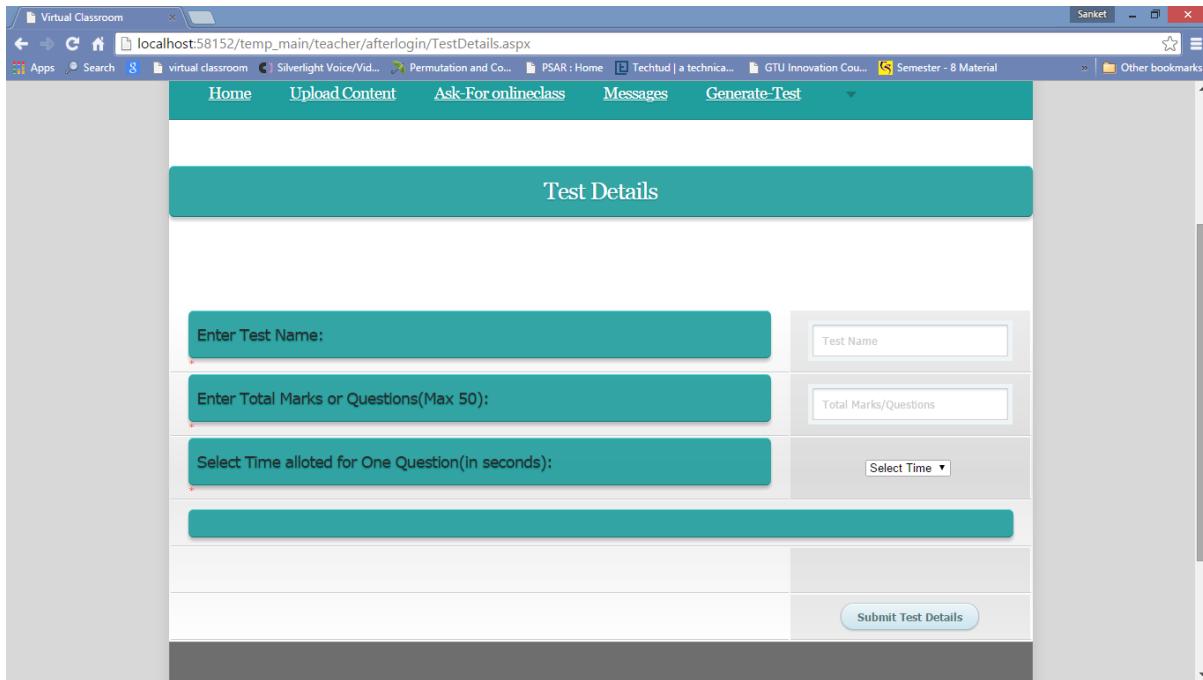


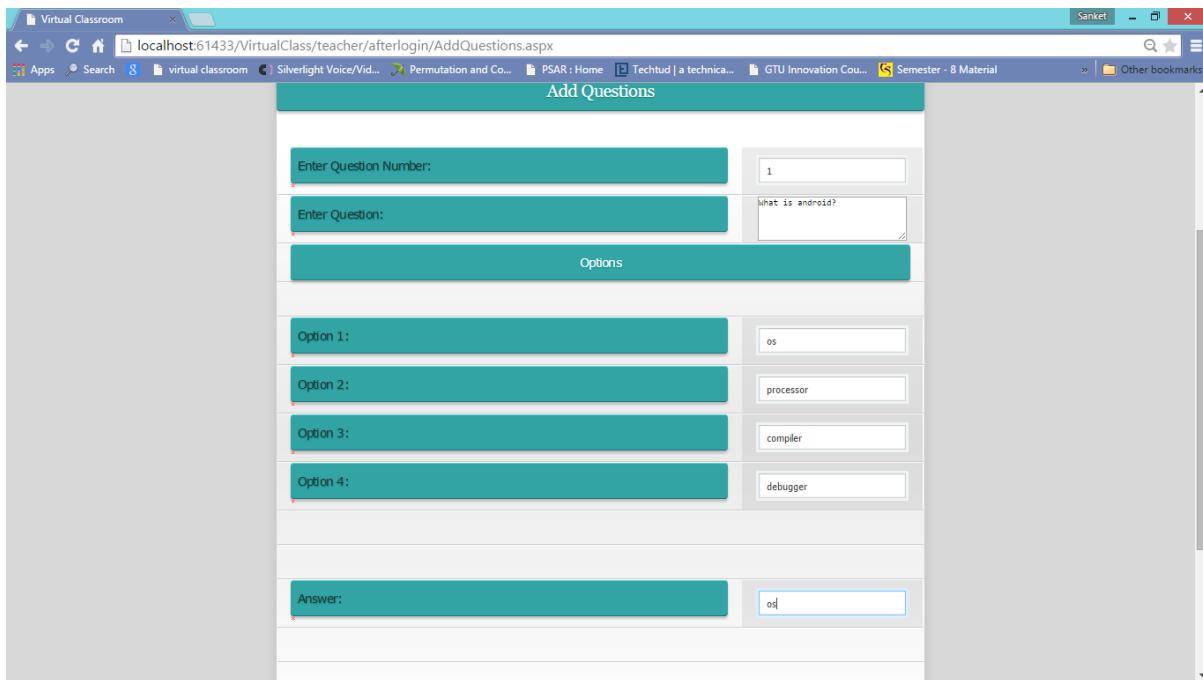
Figure 3.34– Virtual Class at Student Side

### 3.1.5 ASSESSMENT MODULE SCREENSHOTS



The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:58152/temp\_main/teacher/afterlogin/TestDetails.aspx". The page has a teal header bar with menu items: Home, Upload Content, Ask-For onlineclass, Messages, and Generate Test. Below the header is a teal box labeled "Test Details". The main form contains three input fields: "Enter Test Name:" with a placeholder "Test Name", "Enter Total Marks or Questions(Max 50):" with a placeholder "Total Marks/Questions", and "Select Time allotted for One Question(in seconds):" with a dropdown menu currently showing "Select Time". At the bottom right is a "Submit Test Details" button.

Figure 3.35—Test Generation Page at Teacher Side



The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:61433/VirtualClass/teacher/afterlogin/AddQuestions.aspx". The page has a teal header bar with the title "Add Questions". The main form contains several input fields: "Enter Question Number:" with a value of "1", "Enter Question:" with the text "What is android?", and a "Options" section with four options: "Option 1: os", "Option 2: processor", "Option 3: compiler", and "Option 4: debugger". Below these is an "Answer:" field with the value "os".

Figure 3.36—Add Questions Page at Teacher Side

The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:61433/VirtualClass/student/afterlogin/ViewTest.aspx". The page has a header with "Virtual Classroom" and a "Sign-Out" button. Below the header is a navigation menu with links: Home, Go-to-class, View Content, Query, Appear For Test, Report, and Change Profile. The main content area displays a table with four rows of test information:

Test_Id	Test_Name	Marks	Course_Name
49	Android Test-1	5	Android Programming
50	Android 2	4	Android Programming
51	Android 3	3	Android Programming

Each row contains a "Give-Test" button. At the bottom of the page, there is a copyright notice: "© Untitled. All rights reserved."

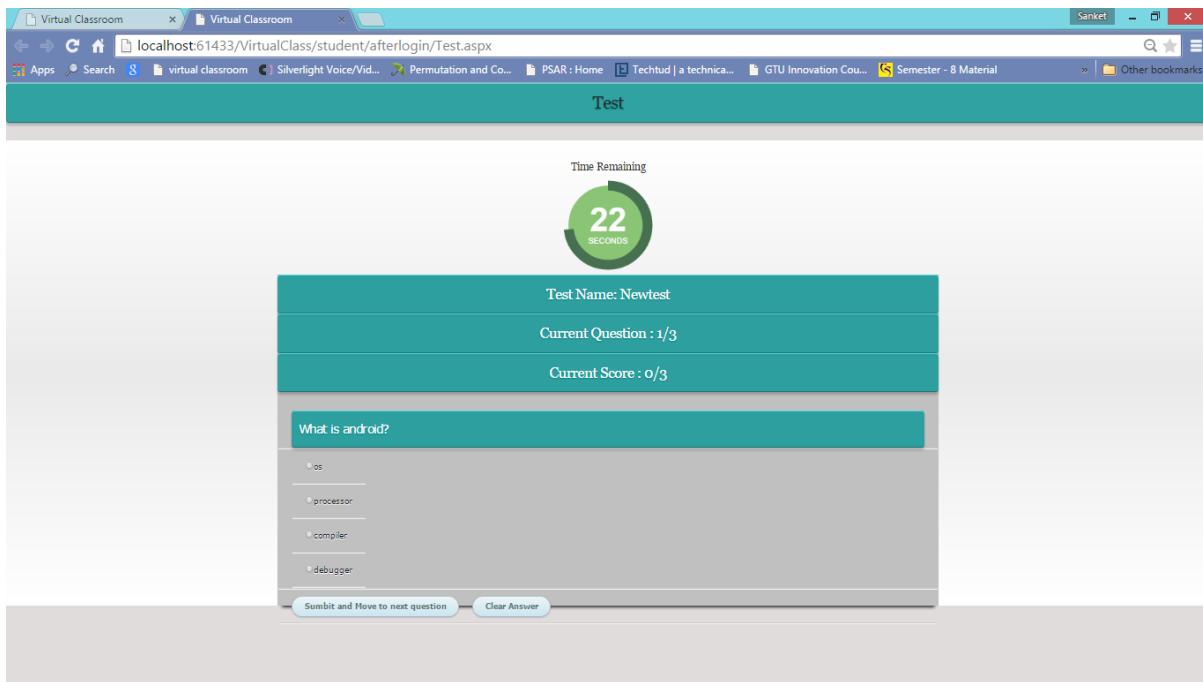
*Figure 3.37–View Test Page at Student Side*

The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:58152/temp\_main/student/afterlogin/TestConfirmation.aspx". The page has a header with "Virtual Classroom" and a "Sign-Out" button. Below the header is a navigation menu with links: Home, View Content, Ask-Query, Appear For Test, Report, and a dropdown menu. The main content area displays a teal bar with the number "38" and the word "INSTRUCTIONS". Below the bar is a list of instructions:

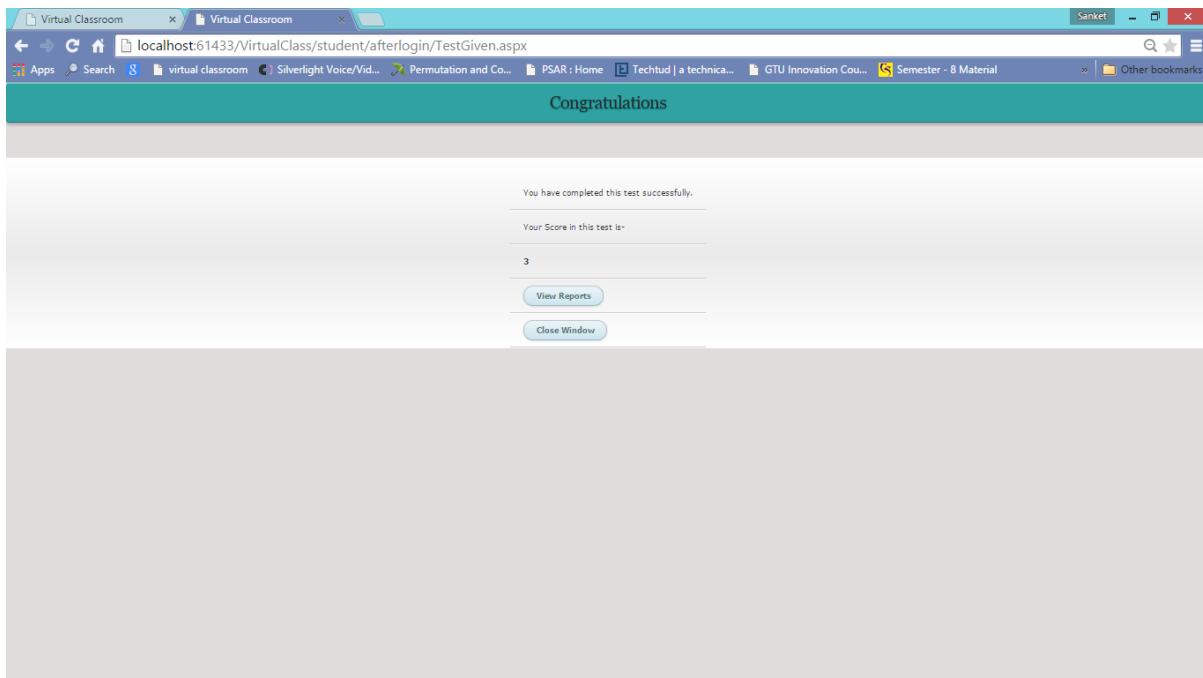
- 1) You cannot refresh the test at any moment.
- 2) Answer once submitted cannot be changed.
- 3) You cannot move back or forward in the test. Questions will be in sequential order only.
- 4) Marks and Time is decided by the teacher. The time duration for a question in this test is 30 and the total number of questions in this test are 2.
- 5) There is no negative marking in this test. You will be awarded one mark for each right answer.
- 6) Once you have appeared for the test, you cannot appear for it again.

At the bottom of the page are two buttons: "Start Test" and "Cancel". A teal bar at the bottom says "BEST OF LUCK". At the very bottom, there is a copyright notice: "© Untitled. All rights reserved."

*Figure 3.38–Test Instruction Page at Student Side*



*Figure 3.39*—Test Dashboard at Student Side



*Figure* —Test Result Page at Student Side

The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:61433/VirtualClass/student/afterlogin/ViewReport.aspx". The page header includes a "Sign-Out" button. The main content area features a title "Virtual Classroom" and a navigation menu with links: Home, Go-to-class, View Content, Query, Appear For Test, Report, and Change Profile. Below the menu is a table displaying student test results:

Test Id	Test Name	Course Name	Score	Total Marks	Action
49	Android Test-1	Android Programming	5	5	<a href="#">View Report</a>
50	Android 2	Android Programming	2	4	<a href="#">View Report</a>
51	Android 3	Android Programming	2	3	<a href="#">View Report</a>
53	Newtest	Android Programming	3	3	<a href="#">View Report</a>

At the bottom of the page, there is a copyright notice: "© Untitled. All rights reserved."

*Figure 3.41*—View Report Page at Student Side

4/11/2015

localhost:50929/VirtualClass/student/afterlogin/ReportPrint.aspx

## VIRTUAL CLASSROOM



11/04/2015

### CONGRATULATIONS

This is to certify that Mr. Ayush Ruchandani has successfully completed the test Parallel Processing 1 under the course Parallel Processing by scoring 2 out of 3. He has secured 66 percentage and has satisfactorily completed the test with First Class Grade.

<http://localhost:50929/VirtualClass/student/afterlogin/ReportPrint.aspx>

1/1

*Figure 3.42–Student Test Report*

4/25/2015

Virtual Classroom

[Sign-Out](#)

## Virtual Classroom

[Home](#)[Go-to-class](#)[View Content](#)[Ouerv](#)[Appear For Test](#)[Report](#)[Change Profile](#)

### VIRTUAL CLASSROOM

Student Name:

Harsh Somanı

Course Name:

Android Programming

CONGRATULATIONS

25/04/2015

Test Id	Test Name	Marks Scored	Total Marks
51	Android 3	2	3
49	Android Test-1	5	5

Total Score:

7

Total Marks:

8

Percentage:

87%

This is to certify that you have successfully completed the course. You have secured Distinction grade for the course Android Programming.

© Untitled. All rights reserved.

<http://localhost:59592/VirtualClass/student/afterlogin/CourseReport.aspx>

1/1

Figure 3.43—Student Course Report

### 3.1.6 EDIT PROFILE AND CHANGE COURSE SCREENSHOTS

The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:61433/virtualClass/student/afterlogin/EditStudentProfile.aspx". The page has a teal header bar with navigation links: Home, Go-to-class, ViewContent, Query, Appear For Test, Report, and Change Profile. A "Sign-Out" button is in the top right. The main content area has a teal header "Edit Your Profile Here." Below it is a form with fields for changing personal details:

Change First Name:*	Harsh
Change Last Name:*	Somani
Change Password:*	Password
Confirm Password:*	Confirm Password
Change Contact Number:*	1234567890
Change State:*	Gujarat
Change City:*	Vadodara

At the bottom right of the form is a blue "Update Details" button.

Figure 3.44—Edit Student Profile

The screenshot shows a web browser window titled "Virtual Classroom" with the URL "localhost:61433/VirtualClass/teacher/afterlogin/EditProfile.aspx". The page has a teal header bar with navigation links: Home, Upload Content, Ask For onlineclass, Queries, Generate Test, and Edit Profile. A "Sign Out" button is in the top right. The main content area has a teal header "Edit Your Profile Here." Below it is a form with fields for changing personal details, similar to Figure 3.44, and a section for profile photo upload:

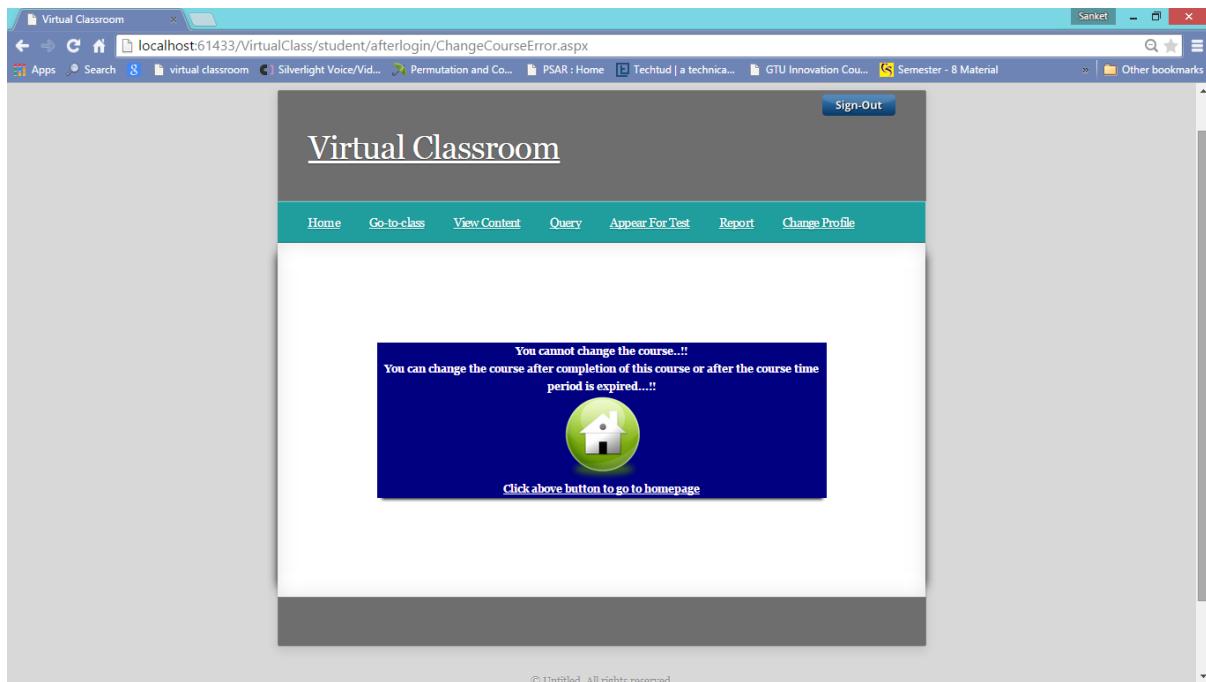
Change First Name:*	Sanket
Change Last Name:*	Somani
Change Password:*	Password
Confirm Password:*	Confirm Password
Change Contact Number:*	sanket
Change State:*	Gujarat
Change City:*	Vadodara

Below the contact details is a section for profile photo:

No Image Uploaded  
Choose file | No file chosen

At the bottom right of the form is a blue "Update Details" button.

Figure 3.45—Edit Teacher Profile



*Figure 3.46–Change Course Error Page*

The screenshot shows a web browser window titled 'Virtual Classroom' with the URL 'localhost:56801/VirtualClass/teacher/afterlogin/ChangeCourse.aspx'. The page has a teal header bar with the title 'Change Course.'. The main content area contains several input fields and a file upload section. The fields are: 'Enter Course Name:' (text input), 'Select Course-cover: (you can upload your profile picture less than 500 kb)' (file input with placeholder 'Data Structures'), 'Enter Course Description:' (text input), 'Enter Course Start Date:' (text input with value '21/05/2015'), and 'Enter Course End Date:' (text input with value '27/05/2015'). On the right side, there is a preview area labeled 'Data STRUCTURES' showing a blank image placeholder. At the bottom right is a 'Update Details' button. The bottom of the screen shows a download bar with 'ds.jpg' and 'Show all downloads...'. The browser's address bar shows 'data structures - Google'.

*Figure 3.47–Change Course Page at Teacher Side*

## 3.2 TESTING

### 3.2.1 TESTING PLAN

Throughout the lifecycle of the system development, we consider some of the **Testing principles** in our mind before applying methods to design effective test cases, which are:

Tests should be planned before testing begins. Test planning can begin as soon as the coding phase is complete.

- The Pareto principle applies to software testing. The Pareto principle implies that 80 percent of all errors uncovered during testing will likely be traceable to 20 percent of all program modules. The problem of course, is to isolate these suspect modules and to thoroughly test them.
- Testing should begin “in the small” and progress toward testing “in the large”
- The first tests planned and executed generally focus on individual program modules. As testing progresses, testing shifts focus in an attempt to find errors in integrated clusters of modules and ultimately in the entire system.

### 3.2.2 TESTING STRATEGY

Strategy of our software testing may be viewed in context of spiral.

#### UNIT TESTING

- **Unit testing** begins at the vortex of the spiral and concentrates on each unit of the software as implemented in source code.
- Unit testing makes heavy use of white box testing techniques, exercising specific paths in a module’s control structure to ensure complete coverage and maximum error detection
- Testing progresses by moving outwards along the spiral to **integration testing** where our focus was on the design and the construction of software architecture
- We then encountered **validation testing**, where the requirements that we had established as a part of the software requirement analysis were validated against the software that had been constructed. Validation testing ensures that

- the software meets all the functional requirements. Black box testing is used widely during validation testing.
- Finally we arrived at the **system testing** where the software and other system elements are tested as a whole

### **BLACK BOX TESTING**

Black box testing focuses on the functional requirements of the software .that is black box testing enables the software engineer to derive set of input conditions that will fully exercise all the functional requirements for the program, it uncovers different class of errors than the white box ones.

Black box testing attempts to find out errors in the following categories:-

1. Incorrect or missing functions.
2. Interface errors
3. Errors in data structures or external database access
4. Behavior or performance errors
5. Initialization and termination errors

### **WHITE BOX TESTING**

Logical paths through the software are tested by providing test cases that exercise specific sets of conditions and loops. It uses control structures of the procedural design to derive test case. Using White Box testing methods, the software engineer can derive test cases that

- 1.Guarantee that all independent paths within a module have been exercised at least once.
- 2.Exercise all the logical decision on the true and false sides.
- 3.Execute all the loops at their boundaries and within their operational bounds.

#### **3.2.3 TESTING METHODS**

##### **1) UNIT LEVEL TESTING**

The aim of unit testing is to find errors in the functionality of the unit module. In our system unit level are testing work as a transaction and master tables was checked for its correctness in accepting data, modification and deletion of each field. Entering a large number of records checked through the system. Check was done that data is saved in the respective tables. The code was checked for all events that no extra code or repeated codes are written. In our system all the Check was done that proper comments are given wherever required.

## 2) STATISTICAL TESTING:

Statistical Testing is used to test the program's performance and reliability and to check how it works under operational conditions. Tests are designed to reflect the actual user inputs and their frequency.

The stages involved in the static analysis for this system are follows.

- Control flow analysis
  - 1. Unreachable code
  - 2. Unconditional branches into loops
- Data use analysis
  - 1. Variable used before initialization
  - 2. Variables declared but never used
  - 3. Variables assigned twice but never used between assignments
  - 4. Possible array bound violations
  - 5. Declared variables
- Interface analysis
  - 1. Parameter type mismatches
  - 2. Parameter number mismatches
  - 3. Non-usage of the results of functions
  - 4. Uncalled functions and procedures

## 3) DEFECT TESTING:

Defect Testing is intended to find inconsistencies between a program and its specification. These inconsistencies are usually due to the program faults or defects.

**4) STRUCTURAL TESTING:**

Path testing has been exercised i.e. every independent execution path through a component or program has been tested. If every independent path is executed then all Statements in the components must have been executed at least once. The structure of program has also been checked.

**5) INTEGRATION TESTING:**

After the individual modules were tested out, the integration procedure is done to create a complete system. This integration process involves building the system and testing the resultant system for problems that arise from component interactions.

**6) PERFORMANCE TESTING:**

Performance testing is designed to test the runtime performance of the system within the context of the system. These tests were performed as module level as well as system level. Individual modules were tested for required performance.

**7) CONDITION TESTING:**

Condition testing is a test case design method that exercises the logical conditions contained in a program module. If the condition is incorrect, then at least one part of the condition is incorrect. It may include

1. Boolean variable error
2. Array Out Index Out of Bounds error
3. String Index out of Bound error
4. Null Pointer Assignment
5. Input Output Connection Exception
6. Parsing (conversion) error

### 3.3 TEST CASES

#### 1) Test cases for login and logout.

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Select no radio button for the user	Null user	Null Reference Exception	One value is by default selected	Passed
2	Trying to login with null value for username	Username with null value	Null Reference Exception	Alert box displaying “Please enter user-name.”	Passed
3	Trying to login with null value for password	Password with null value	Null Reference Exception	Alert box displaying “Please enter password.”	Passed
4	Trying to login with wrong username and password	Wrong username or password	Unable to login	Label showing Wrong username or password.	Passed
5	Trying to access pages without logging in	Null Value	Null Reference Exception	Redirect to login page	Passed
6	Trying to access pages after logging in	Logged in	Logged in successfully.	Can access all web pages	Passed
7	Signing out successfully	Sign out	Destroy session and log out	Destroy session and log out	Passed

Table 11-Test cases for login and logout

**2) Test cases for registration**

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Trying to enter null value for name.	Name with null value.	Null Reference Exception	Alert box displaying "Please enter valid name."	Passed
2	Selecting no value for birthdate	Null birthdate value.	Null Reference Exception	Alert box displaying "Please select your birthdate."	Passed
3	Trying to enter null value for email-id	Null value for email-id	Null Reference Exception	Alert box displaying "Please enter your email-id."	Passed
4	Trying to enter email-id with wrong format.	Wrong expression for email-id	Wrong email-id entered	Alert box displaying "Please enter a valid email-id."	Passed
5	Trying to enter null value for password	Null value for password	Null value stored for password	Alert box displaying "Please enter your password"	Passed
6	Trying to enter null value for confirm password	Null value for confirm password	Null value stored for confirm password	Alert box displaying "Please confirm password."	Passed
7	Trying to enter a value in confirm password which does not match with the value in password	Confirm Password value not matching with value in Password	Passwords not matching.	Alert box displaying "Passwords do not match. Please enter again."	Passed
8	Trying to enter null value in Phone Number	Null value for Phone Number	Null value stored for Phone number	Alert box displaying "Please enter your phone number."	Passed
9	Trying to enter null value for University	Null value for University	Null value stored for	Alert box displaying	Passed

			University	“Please enter your college or university.”	
10	Selecting no file for image	Null value for image	Null value stored for image.	Alert box displaying “Please select your profile picture	Passed
11	Selecting an image with wrong file extension	File selected which is not an image	Wrong file stored	Label showing “Please select a valid image.”	Passed
12	Entering a null value in course name	Course name null	Null value stored in course	Alert message showing “Please enter a course name.”	Passed
13	Entering a null value in course description	Course description null	Null value stored in course description	Alert message showing “Please enter the course description.”	Passed
14	Selecting a course starting date less than current date	Course starting date < current date	Wrong value stored	Alert message showing “please select a valid course starting date.”	Passed
15	Selecting a course ending date less than staring date	Course ending date < current starting date	Wrong value stored	Alert message showing “please select a valid course ending date.”	Passed
16	Submitting the sign-up form with proper inputs	Valid inputs entered	Submitted	Redirected to a page showing Successfully registered	Passed

Table 12-Test case for registration

### 3) Test Cases for Content Upload and Download

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Trying to enter null value in title for content upload	Null value for title	Null Value stored in title	Alert message displaying “Please enter the title for content.”	Passed
2	Trying to enter null value for content description	Null value for description	Null value stored for description	Alert message displaying “Please enter the description.”	Passed
3	Selecting no file for file upload.	Null value for file uploads.	Null value stored.	Alert message displaying “Please select an appropriate file.”	Passed
4	Selecting an inappropriate file	File selected with an invalid extension.	Invalid file uploaded	Alert Message displaying “Please select a valid file type.”	Passed
5	Uploading a valid file with proper inputs	Correct file selected	File Uploaded successfully	File has been uploaded successfully	Passed
6	Downloading an empty file.	Invalid file download	Invalid file downloaded	Only valid files stored and can be downloaded	Passed
7	Viewing all the files of the current course test.	No data	Null reference	Null Reference Exception	Passed

Table 13-Test Cases for Content Module

#### 4 Test Cases for Online Class

No.	Test Cases	Input	Expected Output	Actual Output	Remark
1	Trying to enter null value in Video Class Request Test	Null value for video class request test	Null Value stored for video class request	Alert Message displaying “Please give a title to the class name.”	Passed
2	Selecting a time before the current time test	Class time is before current time	Video Class not possible as time is finished.	Alert Message showing “Please select the time after the current time.”	Passed
3	Sending the request for video class with proper inputs	Request sending	Request sent to admin for approval	Request sent to admin for approval	Passed
4	Trying to view the online class while not scheduled test.	No data	Null Reference Exception	Label displaying “No class scheduled at the moment.”	Passed
5	Viewing the class at scheduled time	No input	Viewing online class.	Viewing online class	Passed
6	Trying to view the class after the end time	No input	Class ended	Class ended	Passed

Table 14-Test Cases for Online Class Module

### 5) Test Cases for Course Change

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Trying to change course while already enrolled to a course test.	Course change	Removing course	Cannot change course while enrolled	Passed
2	Changing course after completing previous course test	Change Course	Removing and updating course	Course Changed	Passed
3	Entering null value for course test.	Null value for course	Updating null course.	Alert message displaying “Please enter a course name.”	Passed
4	Removing tests from previous course test.	No Data	Tests from previous course removed	Tests from previous course removed	Passed
5	Removing content from previous course test.	No Data	Contents from previous course removed.	Contents from previous course removed.	Passed
6	Entering a null value in course description	Course description null	Null value stored in course description	Alert message showing “Please enter the course description.”	Passed
7	Selecting a course starting date less than current date	Course starting date < current date	Wrong value stored for course change	Alert message showing “please select a valid course starting date.”	Passed
8	Selecting a course ending date less than starting date	Course ending date < current starting date	Wrong value stored for course change	Alert message showing “please select a valid course ending date.”	Passed

Table 15-Test Cases for Course Change

### 6) Test Cases for Query Posting

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Trying to enter a null value for query title	Query Title Null	Null Value stored for query title	Alert Box showing "Please enter a query title."	Passed
2	Trying to send a null message	Message null	Null value stored for message.	Alert box showing "Please enter your message."	Passed
3	Sending a message with proper inputs	All inputs correct	Successful stored	Message is sent.	Passed
4	Trying to send a null reply	Reply null	Null value stored for reply	Alert box showing "Please enter your reply."	Passed
5	Sending a reply successfully	True reply	Reply stored	Reply sent successfully.	Passed
6	Trying to view messages sent by current user.	Messages sent by you.	Displaying messages sent by current user.	Displaying messages sent by current user.	Passed
7	Trying to view messages sent by all users of current course	Messages sent by all users of current course	Displaying messages sent by all users under current course	Displaying messages sent by all users under current course	Passed

Table 16-Test Cases for Query Module

### 7) Test Cases for Test Generation

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Trying to enter null value for test title	Test Title null	Null value stored for test title	Alert message displaying “Please enter a test title.”	Passed
2	Trying to enter null value for total questions	Total questions null	Null value stored for total questions.	Alert message displaying “Please enter number of questions.”	Passed
3	Trying to enter number of questions not in range.	Total questions outside range	Incorrect value stored for total questions.	Alert message showing “please enter number of question between 20 to 50”	Passed
4	Selecting null value for time	Time is null	Null stored for time	Alert message showing “Please select time for a single question.”	Passed
5	Trying to enter null value for question number	Question number null	Null stored for question number	Alert message showing “Please enter question number.”	Passed
6	Trying to enter null value for question	Question null	Null stored for question	Alert message showing “Please enter question.”	Passed
7	Trying to enter null value for options	Options null	Null stored for options	Alert message showing “Please enter option.”	Passed
8	Trying to enter null value for answer	answer null	Null stored for answer	Alert message showing “Please enter answer.”	Passed
9	Trying to enter answer not from the given options	Wrong answer	Wrong answer stored	Alert Message showing “The answer must match with one of the given	Passed

				options.”	
10	Submitting the questions with correct input	Correct questions	Question along with options and answer stored	Question along with options and answer stored	Passed
11	Trying to add more number of questions	Questions greater than total questions	More questions stored	All questions stored and redirected to other page.	Passed

Table 17-Test Cases for Test Generation**8) Test Cases for Report Viewing and Appearing for Tests**

No.	Test Case	Input	Expected Output	Actual Output	Remark
1	Trying to attempt a test.	Test attempt for first time	Give Test	Give Test	Passed
2	Selecting no option from the given ones till the time finishes	No input	No score added and move to next question	No score added and move to next question	Passed
3	Selecting an incorrect option from the given ones till the time finishes	Wrong Answer selected	No score added and move to next question	No score added and move to next question	Passed
4	Selecting a correct option from the given ones till the time finishes	Right Answer selected	Score added and move to next question	Score added and move to next question	Passed
5	Selecting a correct option from the given ones before the time finishes	Right Answer selected	Score added and move to next question	Score added and move to next question	Passed
6	Selecting an incorrect option from the given ones before the time finishes	Wrong Answer selected	No Score added and move to next question	No Score added and move to next question	Passed
7	Reaching the end of the test	No input	Displaying total score	Displaying total score	Passed

8	Trying to attempt the test for second time	No input	Displaying the test	Displaying the total score with label- you have already given this test	Passed
9	Displaying a report for a test not given	No input	Null Reference Exception	Report of only those test can be viewed which are given	Passed
10	Displaying a report for a test given	No Input	Report display	Report Display	Passed
11	Displaying the course report	No input	Report Display	Report Display	Passed
12	Displaying the report of course which existed before	No input	Report Display	Only current course report can be displayed	Passed

*Table 18*-Test Cases for Report Viewing and Test Appearance

**RESULTS AND CONCLUSION****CHAPTER-4****4.1 LIMITATIONS**

Limitations of our system are:

- The hardware requirements for our system will be high. As we are providing video conferencing, the client side will need to have all the required hardware components for the same.
- Our system requires high bandwidth rate. The internet connection should be reliable.
- The system requires a large database to store the contents like e-books, videos, messages etc.
- The system currently provides only a single course for all the users of the system.

**4.2 FUTURE ENHANCEMENT**

The Future scope of our system is:

- An android application for the system can be made at the later stages.
- A payment module can be added into the system. Currently the system provides free services to every person. As the cost of development and maintenance will increase we can add the payment module. Also we can develop a payment to teacher system where each and every teacher gets his/her wages.
- A more trusted authentication of teachers system can be provided where every teacher will be verified before signing up into the system.
- A chat module can also be added in the later stages to enhance the communication system between the teachers and the students.
- Assignment section can also be added along with the evaluation module to evaluate performances of the students.
- The enhancement of video lecture can be done. Video broadcasting can be provided. White Board and hand raising options can be included.

### 4.3 CONCLUSION

Virtual Academy will be able to provide the solution it was expected to do. The expected outcome was to provide new teaching policies. This web application in the response to that will provide video lectures that will enhance the performances. Along with that it provides content sharing and management system that allows users to view data like e-books, presentations etc. which will improve the educational qualities.

Along with that this system will provide assessment part where a student will be evaluated based on his/her performance. This will reduce the work of teacher and student will be able to get his/her result immediately.

In conclusion, Virtual Classroom is in process of setting up as per the standards and qualities it was required to be. Though this product will need lot of enhancement in near future, still this product shall meet all the requirements by its end. It can help student to learn better and make an implementing academy more efficient and avail them a stronger medium of learning for their currently existing institutes by the concept of blended learning.

Every system has its limitations and how it can become better in the future. The topics below mention the limitations of the Virtual Classroom and the future enhancements which can be made into the system for its betterment.

## BIBLIOGRAPHY

1. **VIRTUAL CLASSROOM** - [www.it.iitb.ac.in/~praj/acads/Virtual%20Classroom.ppt](http://www.it.iitb.ac.in/~praj/acads/Virtual%20Classroom.ppt)
2. **SOCKETCODER** - <https://www.codeplex.com/site/users/view/SocketCoder>
3. **VIDEO AND VOICE CONFERENCING** - <https://silverlightvideochat.codeplex.com/>
4. **Virtual Classroom/Project Room** - [www.iitmandi.ac.in/hn/campus/students/vcrpr.html](http://www.iitmandi.ac.in/hn/campus/students/vcrpr.html)
5. **Virtual Class Room** - [www.slideshare.net/BrianNelson/virtual-class-room](http://www.slideshare.net/BrianNelson/virtual-class-room)
6. **Khali Adam (VIRTUAL CLASSROOM)** - [www.slideshare.net/khld77/virtual-classroom-9438664](http://www.slideshare.net/khld77/virtual-classroom-9438664)
7. **DEFINITION** - [whatis.techtarget.com](http://whatis.techtarget.com)
8. **SYSTEM** - [www.ijettjournal.org/volume-4/issue-4/IJETT-V4I4P344.pdf](http://www.ijettjournal.org/volume-4/issue-4/IJETT-V4I4P344.pdf)
9. **VIRTUAL CLASSROOM IN ASP.NET** - [studentprojects.co.in/2013/09/virtual-classroom-net/](http://studentprojects.co.in/2013/09/virtual-classroom-net/)
10. **Wipro** - <http://en.wikipedia.org/wiki/wipro>
11. [www.wipro.com](http://www.wipro.com)
12. **Software Model** - <http://en.wikipedia.org/wiki/incremental-model>
13. **Phase Implementation** - [http://en.wikipedia.org/wiki/Phased\\_implementation](http://en.wikipedia.org/wiki/Phased_implementation)

## APPENDIX