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Major Project Report: eSpace – Online Learning Platform

Department of – Computer Science and Engineering

Under Supervision of:

Er. Vivek Patel (HOD)

Er. Ajeet Sir

Er. Ashish Vishwakarma

Submitted By:

Sr no.	Name	Task
1.	Sunny Patel (Group Leader)	Project Management with Front-end and Back-end
2.	Akhilesh Yadav	Logical Implementation
3.	Sundaram Chaurasiya	Content writing
4.	Anand Kumar Yadav	Webpage, Landing page
5.	Meena Sahani	Registration Form
6.	Shivraj	Front-end, Webpage
7.	Shushil Pandey	Disclaimer, Webpage
8.	Gaurav Gupta	Login form
9.	Rashi Srivastava	Design, Backend
10.	Udaybhan Nishad	Testing

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eSpace – Online Learning Platform

1. INTRODUCTION

An online learning platform is a space or portal filled with educational content and/or live instruction on a particular subject or many different topics. Such platforms - also referred to as "e-learning" - are typically membership-based, but there are other options where users can jump in and learn immediately without registering.

An online learning platform is a webspace or portal for educational content and resources that offers a student everything they need in one place: lectures, resources, opportunities to meet and chat with other students, and more. It is also an excellent way for the student and the teacher to monitor student progress.

An e-learning platform can be restricted by the membership (only those who are registered to it can access it), but it can also be free to access for anyone wanting to learn.

The benefit of an online course platform are that both students and teachers can track the students' progress through the course material, and everything is neatly organized in one place. Additionally, students may also have an option of interacting with each other on the platform.

1.1 BACKGROUND AND MOTIVATION

Online technology is constantly evolving, and education follows it in an attempt to take advantage of new advances. Online education is continuing to expand. According to Allen and Seaman (2010), 5.6 million students in the United States were enrolled in at least one online course in the fall semester of 2009. This is an increase of 1 million students from the past year. Overall, online enrollment has increased 21%, while enrollment in higher education programs as a whole only increased 2%.

Online learning offers several advantages over face to face courses. Some of these include unlimited access to review materials before exams, accommodation of many learning styles, and scheduling flexibility (Butler, 2010). Resident students noted flexibility and convenience as the main reasons for enrolling in online courses at Penn State University (Pastore and Carr-Chellman, 2009).

A serious disadvantage of online courses is the upfront costs and time required to develop them (Berge et. al, 2001). Another trend observed in online classes is an increased drop-out rate. The increased rate of student drop out speaks to the need to improve online learning environment design to increase student motivation and their active engagement in the course (Nash, 2005).

Although online learning presents various obstacles, it does provide students with unique opportunities. For example, students can experience field based activities which may not be possible due to weather or classroom budget constraints. Online learning activities can also “transport” students throughout the world. For example, with web cams students could experience what happens live at the winter soybean nursery in 10 Puerto Rico. In the plant breeding activity designed for this study, students can experience the steps in the plant breeding process (which takes several years) in about a half hour. These experiences cannot be provided in a traditional classroom environment. Online learning environments also open up the possibility of collaboration with students from other universities.

1.2 OBJECTIVES

Over the years, there have always been various definitions to define what eLearning really is, or how eLearning is conducted effectively as it always focusses on the specific needs of an individual or an organization. So, let's give the definition of the term first and then move on to the major goals and expectations of eLearning.

eLearning is a learning process with the combination of content that is both delivered digitally and through face-to-face learning. eLearning contributes to the shifts from traditional face-to-face learning to the use of web technological tools which enhances collaborative learning and presents an entirely new learning platform for students. eLearning has also been the principal form of distance education but now, it is also changing the instructions on higher education as it is now becoming a global agent in higher education. Advancements in technology learning have contributed to the enhancements of generations of face-to-face learning and generations of distance education. As to it, when eLearning develops, it has begun to use different approaches to address diverse goals.

The Major Goals Of eLearning

There are certain goals when it comes to eLearning and some of these are to:

- Enhance the quality of learning and teaching
- Meet the learning style or needs of students
- Improve the efficiency and effectiveness
- Improve user-accessibility and time flexibility to engage learners in the learning process

1.3 PURPOSE AND SCOPE

Purpose

Online education enables the teacher and the student to set their own learning pace, and there's the added flexibility of setting a schedule that fits everyone's agenda. As a result, using an online educational platform allows for a better balance of work and studies, so there's no need to give anything up. Studying online teaches you vital [time management skills](#), which makes finding a good work-study balance easier. Having a common agenda between the student and teacher can also prompt both parties to accept new responsibilities and have more autonomy.

Online education enables you to study or teach from anywhere in the world. This means there's no need to commute from one place to another, or follow a rigid schedule. On top of that, not only do you save time, but you also [save money](#), which can be spent on other priorities. The virtual classroom is also available anywhere there's an internet connection, and a good way to take advantage of this is to travel. For example, if you're studying abroad and want to get a job, online education is a great choice. There's no reason to give up on working or studying while exploring new and exotic places.

Scope

In the modern age, access to information is the key to professional success. Gone are the days when education and learning were confined to colleges and universities. In the digital age, learning is open to all. [E-learning](#) is a boon to people who face obstacles in getting a traditional college education. Online learning has revolutionized the knowledge economy on a global scale.

No matter which background one comes from, there are a plethora of online courses certification programs that can expand your knowledge arsenal and make you better equipped in today's competitive job market.

A recent study made by the World Economic Forum showed that after the United States, India has the largest number of online course enrollments with more than 2,00,000 students. Reputed universities offer top-notch certified online courses, bringing world-class professors and instructors to impart learning to the students.

- Indian students are highly enthusiastic about the [concept of online education](#). They get a chance to showcase their skills and capabilities in an interactive and advanced environment.
- Online courses certification programs eliminate the financial and geographical barriers to receiving a high-quality education.

2. SURVEY OF TECHNOLOGY

HTML

Hyper text markup language (HTML) refers to the principal markup language used in exhibiting web pages and information that can be displayed in an internet browser. A web browser reads HTML credentials and converts them into web pages that are observable and perceptible.

Elements consisting of tags enclosed in position brackets denote HTML. These elements apply as the structure blocks for every website built. HTML allows for descriptions and entrenchment of items and application when creating association forms. It also offers the means to generate ordered credentials through indicating structural semantics for text in the form of headings, paragraphs, lists and associations, among others.

Delivery of HTML documents applies means similar to those used by other computer files. In some instances, delivery happens through hypertext transfer protocol (HTTP). An HTML element refers to all items between the start and end tags. The universal form of HTML elements is in a pair of tags consisting of a start tag and an end tag.

CSS

CSS stands for Cascading Style Sheets. CSS is a language that describes the layout and formatting of any mock-up language for example HTML, XML and XHTML. The majority of web pages these days use CSS to present their data because CSS really brings the web pages to life.

CSS defines how the [HTML](#) structure will be presented. Being able to style the HTML elements makes it so that you can present your data in a more readable and understandable manner. It is also great for helping people with disabilities for example, creating a button that increases the font size or changes the text and background colour. This can be done by using the link tag in the header section of the document. External styling can be overwritten by both internal and in-line styling.

The box model can be used in all HTML elements and is essentially a box that goes around the HTML element. The style of the box is defined by the element's attributes. The box module consists of four different parts: margin, border, padding and content. The margin creates a transparent space outside the border. The border creates a border around the padding and content. The padding defines the space between the element and the boarder. The content is actually the contents of the box. This is where the element is displayed.

JavaScript

JavaScript is a very powerful client-side scripting language. JavaScript is used mainly for enhancing the interaction of a user with the webpage. In other words, you can make your webpage more lively and interactive, with the help of JavaScript. JavaScript is also being used widely in game development and [Mobile](#) application development.

JavaScript was developed by Brendan Eich in 1995, which appeared in Netscape, a popular browser of that time. The language was initially called LiveScript and was later renamed JavaScript. There are many programmers who think that JavaScript and [Java](#) are the same. In fact, JavaScript and Java are very much unrelated. Java is a very complex programming language whereas JavaScript is only a scripting language. The syntax of JavaScript is mostly influenced by the programming language C.

Being a scripting language, JavaScript cannot run on its own. In fact, the browser is responsible for running JavaScript code. When a user requests an HTML page with JavaScript in it, the script is sent to the browser and it is up to the browser to execute it. The main advantage of JavaScript is that all modern web browsers support JavaScript. So, you do not have to worry about whether your site visitor uses Internet Explorer, Google Chrome, Firefox or any other browser. JavaScript will be supported. Also, JavaScript runs on any operating system including Windows, [Linux](#) or Mac. Thus, JavaScript overcomes the main disadvantages of [VBScript](#) (Now deprecated) which is limited to just IE and Windows.

To start with, you need a text editor to write your code and a browser to display the web pages you develop. You can use a text editor of your choice including Notepad++, Visual Studio Code, Sublime Text, Atom or any other text editor you are comfortable with. You can use any web browser including Google Chrome, Firefox, Microsoft Edge, Internet Explorer etc.

jQuery

“jQuery is a library of JavaScript Functions.” (w3schools, jQuery Introduction, 2012?) This means that even designers who don’t know that much code can still build a dynamic website with jQuery because it’s very simple and easy to use and “knowing simple JavaScript syntax is enough” (Narayan, 2011).

Similarly, designers or developers don’t need to write all of the code from start but can rather use jQuery meaning that only small amount of code will need to be written for a dynamic website that is also cross browser compatible. jQuery provides “many easy to use functions and methods to make rich applications” (India, 2008) which increases productivity as it is fast and produces simpler and cleaner code. (Narayan, 2011)

The features that jQuery provides are as follows:

- DOM element selections functions
- DOM traversal and modification
- Events/ HTML event functions
- CSS and HTML elements manipulation
- Effects and animations
- Ajax
- Extensibility
- Utilities – such as browser version and the each function.
- JavaScript Plugins

PHP

A PHP is a hypertext preprocessor and it is widely used scripting language, which was designed for the purpose of web development for producing dynamic web pages. For this same purpose, a PHP code will be embedded inside the HTML source document. The web server along with a processor module, which generates web page, will interpret this document. Knowing how to run [PHP](#) can be useful for people using the scripting language.

PHP is a general-purpose programming language, a PHP code will be processed by an interpreter application inside the command line. This will be done while performing the desired operation of the operating system and producing a program output from the standard channel of output. PHP can function as the graphical language as well. This PHP is available as a processor for most of the modern web servers and as a standalone interpreter for some of the operating systems and platforms for computing.

PHP is a scripting language, which is well suited for the server-side web developers where this PHP will run on the [web server](#). A PHP code is always executed on the runtime of PHP, for creating dynamic web page content. Sometimes it is used for the command-line scripting and the client side applications for GUI. PHP can be easily deployed on any of the web server, operating systems and platforms and one can use it for managing the relational database system. The PHP group allows to the use of this software for free and will give complete source to the user for building, customizing and extending the language for their own use.

MYSQL Database

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. MySQL is becoming so popular because of many good reasons –

- MySQL is released under an open-source license. So you have nothing to pay to use it.
- MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages.
- MySQL uses a standard form of the well-known SQL data language.
- MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA, etc.
- MySQL works very quickly and works well even with large data sets.
- MySQL is very friendly to PHP, the most appreciated language for web development.
- MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB).
- MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments.

3. REQUIREMENT AND ANALYSIS

The main goal of this work is to analyze and design an eLearning platform aiming to provide learning management systems (LMS) with innovative services in terms of learning analytics and gamification.

3.1 Problem definition

The truth is, for many students, online learning is only a formality and not a real substitute for regular teaching. Some teachers only share material to students without teaching it. Online testing is sometimes based on the principle of “work it out yourself”. Students are not acquiring real, long-lasting knowledge. And some students don’t have the opportunity to leave their home during the two hours allowed during the curfew because they have to sit in online classes.

Some students don’t even have proper equipment to attend online classes. They don’t have electronic devices such as computers, telephones and cameras. The number of these devices in households is often limited which can be very inconvenient for online appointments, classes, and meetings that take place simultaneously.

Also, some teachers don’t consider the fact that during online testing, the student may lose the internet connection. Unfortunately, if this happens, the student gets graded based on the number of questions answered and recorded in the system before the connection was lost. Students also face problems managing their own time as a result of online teaching.

3.2 REQUIREMENT SPECIFICATION

E-learning has evolved over the last two decades from being a supplementary tool to becoming an essential companion to class teaching. This has become known as blended learning (Maina, Njoroge, Waiganjo, & Gitonga, 2015). Much of the initial focus of research has been on the software side of E-learning (Adams & Jansen, 1998; Laiw, 2008; Garrison, 2011). However, recently the hardware and the technology of delivering has been getting more attention in the form of M-learning or mobile learning (Georgiev, Georgiev, & Smirkarov, 2004).

Researchers seem to agree that the use of tablets has potential that is underutilized in academia (Daccord & Reich, 2015; Maina, Njoroge, Waiganjo, & Gitonga, 2015; Moran, Hawkes, & Gayar, 2010). The team reviewed publications of experiments on the use of tablets in higher education identifying some key findings. From these findings, the team has developed system requirements for the design of a purpose-built educational tablet for higher education.

These finding include selecting tablets that would mirror the institution's own computer lab designs, including the operating system, educational applications, as well as restricting use of camera, restricting download of none-educational applications and apps. In addition, the team recommends the tablet to be pre-loaded with carefully selected educational apps that would complement and utilize the institution's own email system in a form of instance message link to the tablet to enhance the benefit of the device as a dynamic and active-learning tool.

3.3 HARDWARE AND SOFTWARE REQUIREMENTS

Our e-learning modules run in a web browser and should work across most platforms. However, we have had to test against a standard office environment and can only guarantee that they will work on the following technical specifications:

PC minimum hardware specification

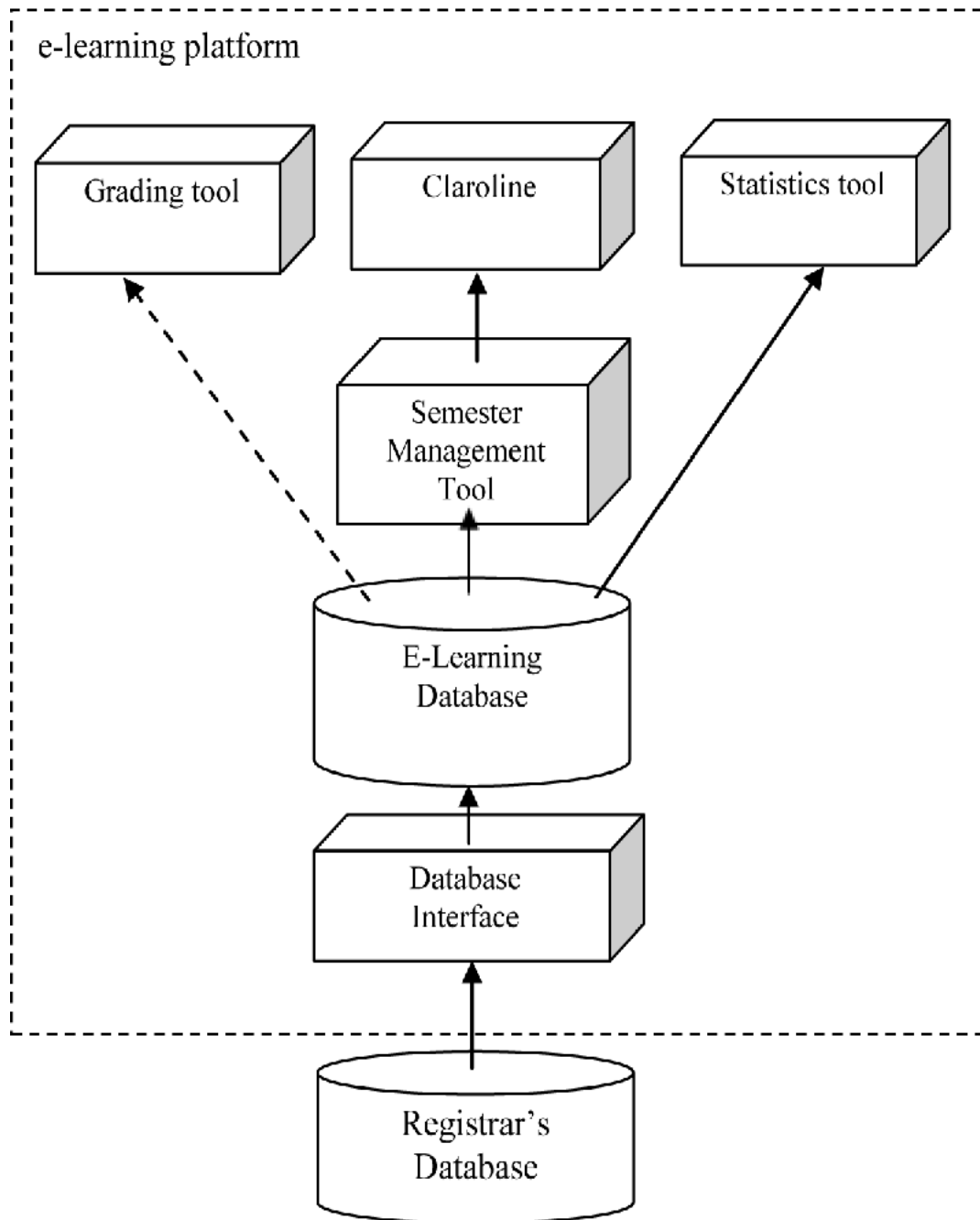
- Platform: IBM PC Compatible
- Processor: Pentium III or equivalentProcessor speed: 500 MHzRAM: 256 Mb
- Screen resolution: 1024x768
- Sound Card: Included with headphones as a minimum
- Input devices: Mouse and keyboard

End user PC software specification

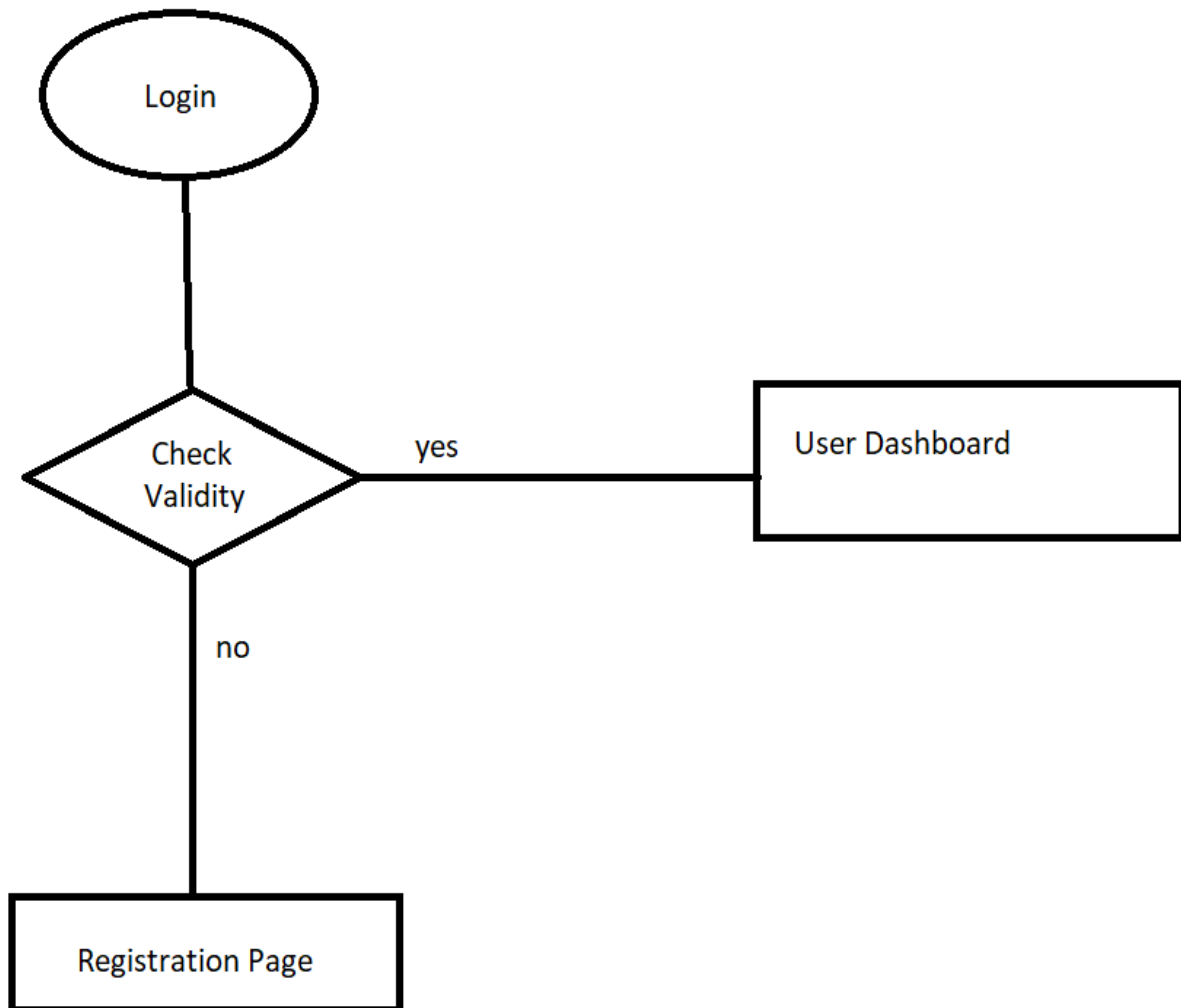
- Operating systems: Windows XP SP2 and SP3
- Browser: IE 6, 7 and 8

4. SYSTEM DESIGN

4.1 PLATFORM ARCHITECTURE



4.2 DATA FLOW DIAGRAM



5. Integrated Development Environment(IDE)

An integrated development environment (IDE) is software for building applications that combines common developer tools into a single graphical user interface (GUI).

Visual Studio Code (IDE)

We have used Visual Studio Code for our project development, it is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps. Although the editor is relatively lightweight, it includes some powerful features that have made VS Code one of the most popular development environment tools in recent times.

It is a lightweight but powerful source code editor which runs on your desktop and is available for Windows, macOS and Linux. It comes with built-in support for JavaScript, TypeScript and Node.js and has a rich ecosystem of extensions for other languages (such as C++, C#, Java, [Python](#), PHP, Go) and runtimes (such as .NET and Unity).

At its heart, Visual Studio Code features a lightning fast source code editor, perfect for day-to-day use. With support for hundreds of languages, VS Code helps you be instantly productive with syntax highlighting, bracket-matching, auto-indentation, box-selection, snippets, and more. Intuitive keyboard shortcuts, easy customization and community-contributed keyboard shortcut mappings let you navigate your code with ease.

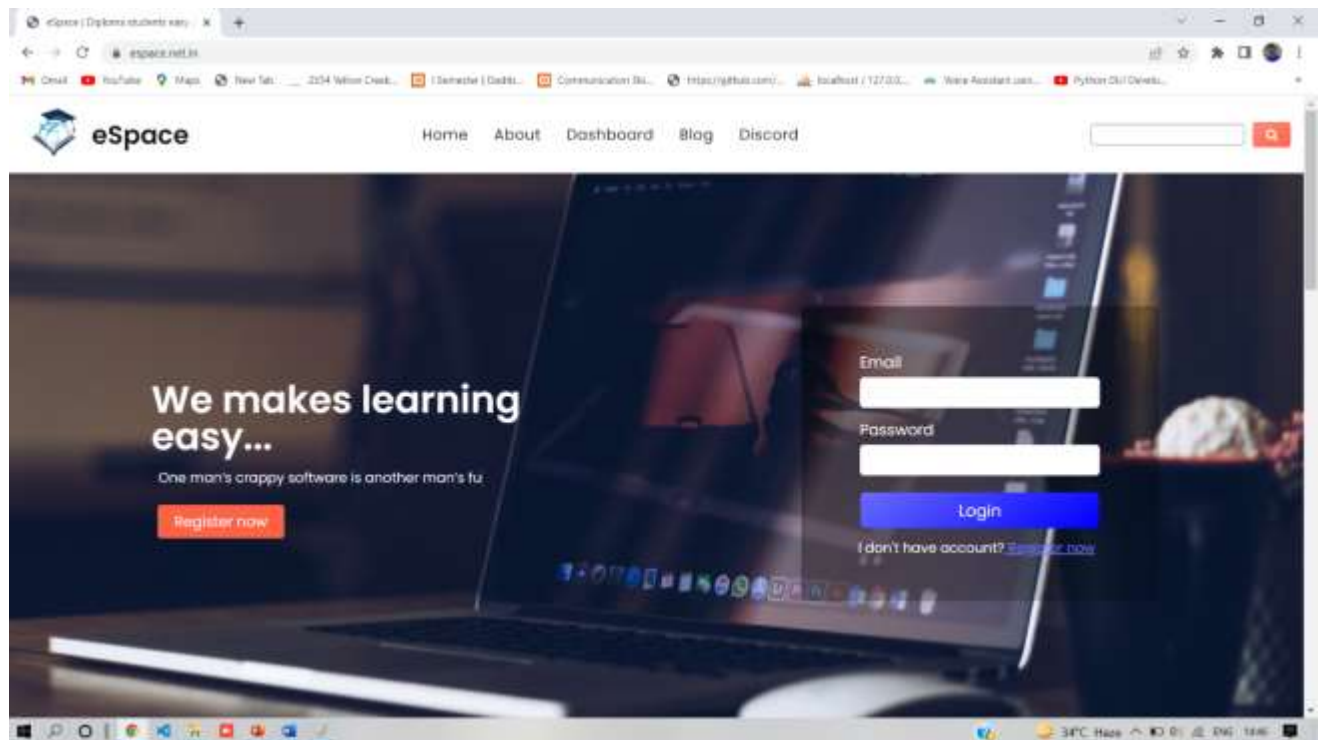
For serious coding, you'll often benefit from tools with more code understanding than just blocks of text. Visual Studio Code includes built-in support for IntelliSense code completion, rich semantic code understanding and navigation, and code refactoring.

And when the coding gets tough, the tough get debugging. Debugging is often the one feature that developers miss most in a leaner coding experience, so we made it happen. Visual Studio Code includes an interactive debugger, so you can step through source code, inspect variables, view call stacks, and execute commands in the console.

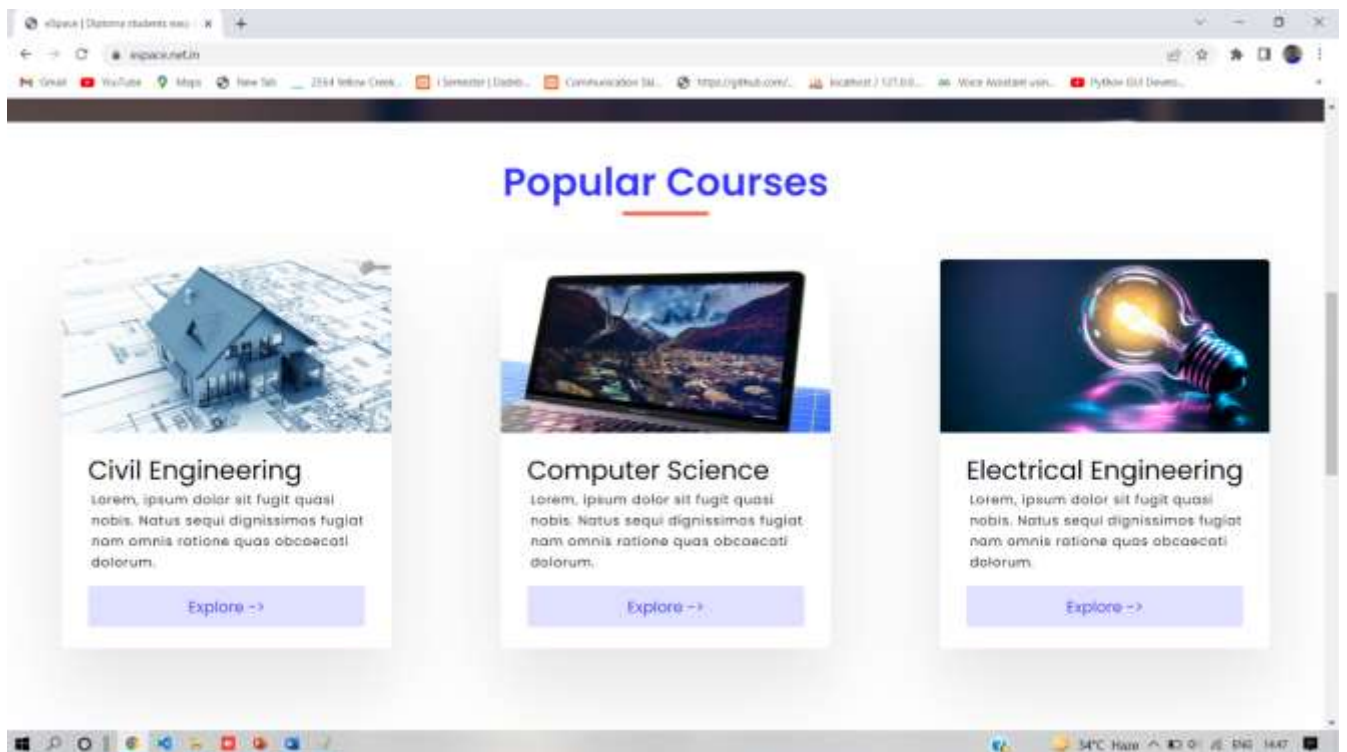
VS Code also integrates with build and scripting tools to perform common tasks making everyday workflows faster. VS Code has support for Git so you can work with source control without leaving the editor including viewing pending changes diffs.

6. PROJECT SCREENSHOTS

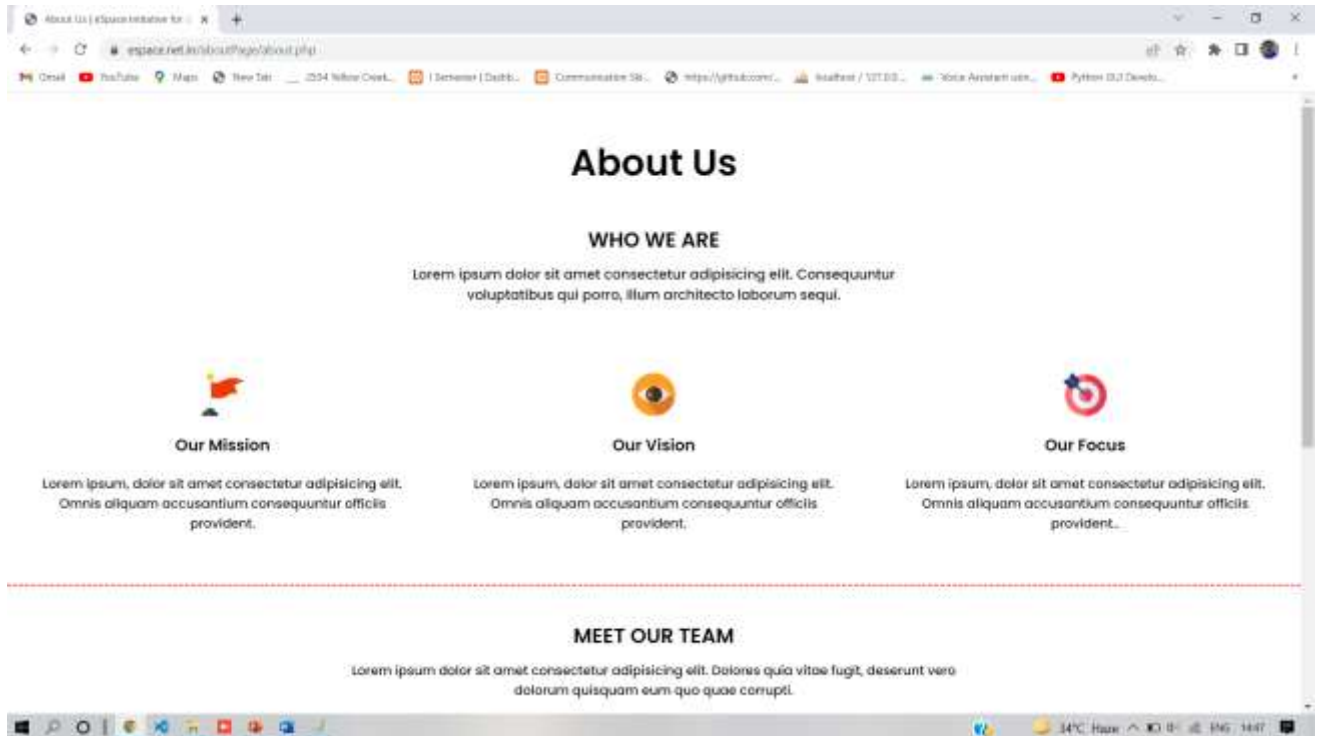
Screenshot 1: Home Page



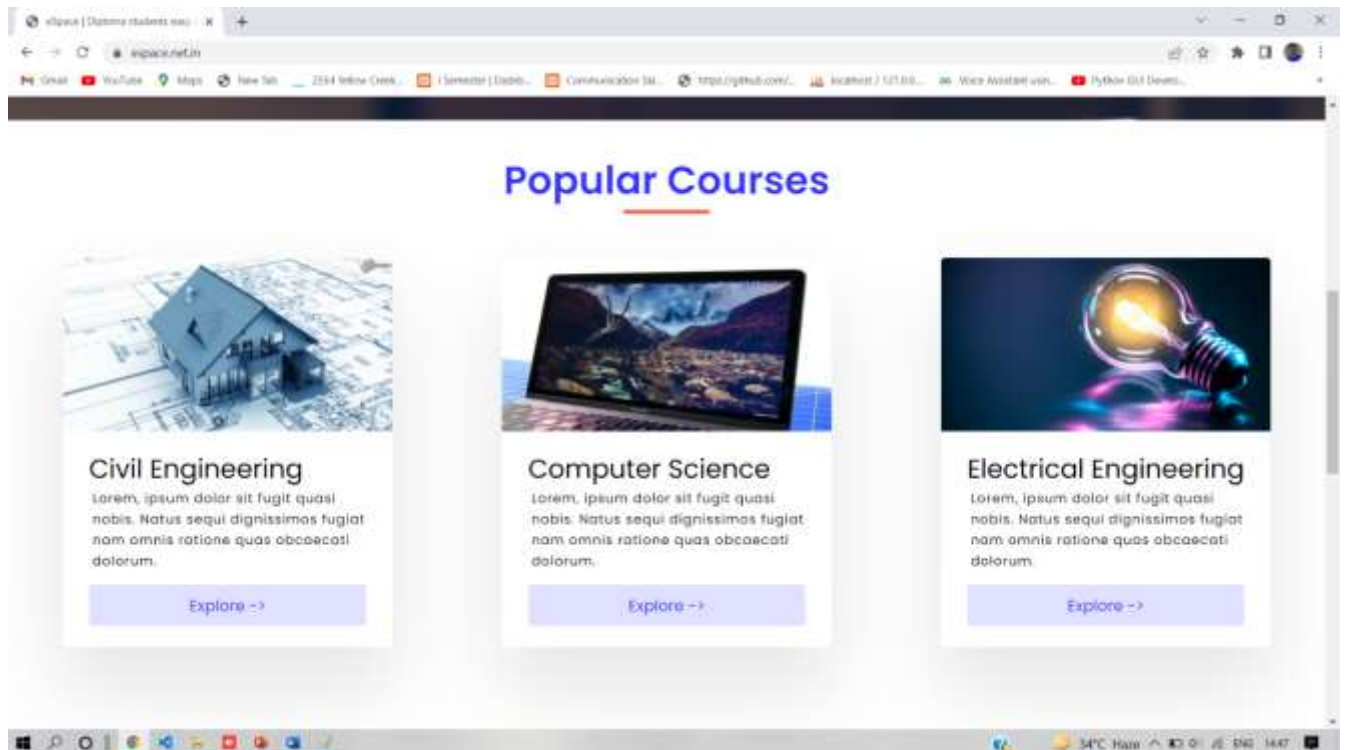
Screenshot 2: Home Page



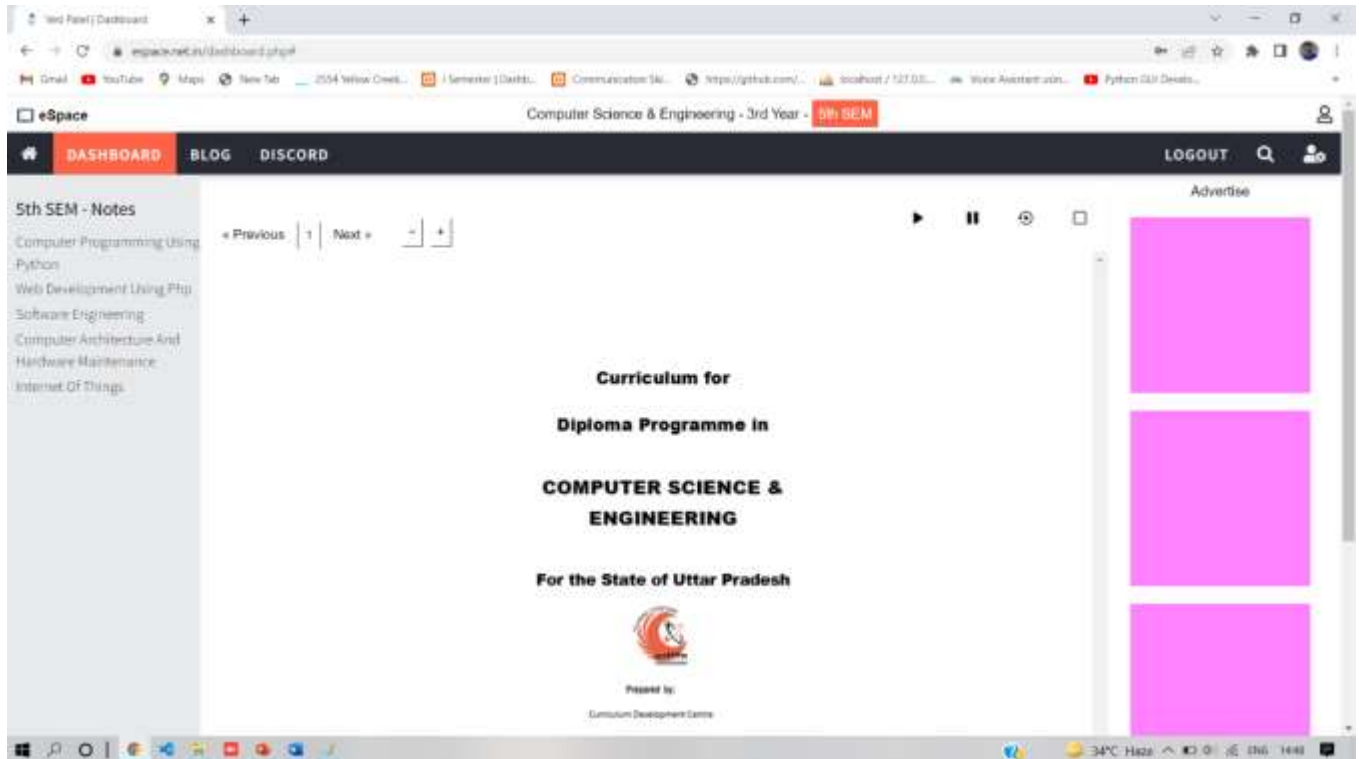
Screenshot 3: About Us Page



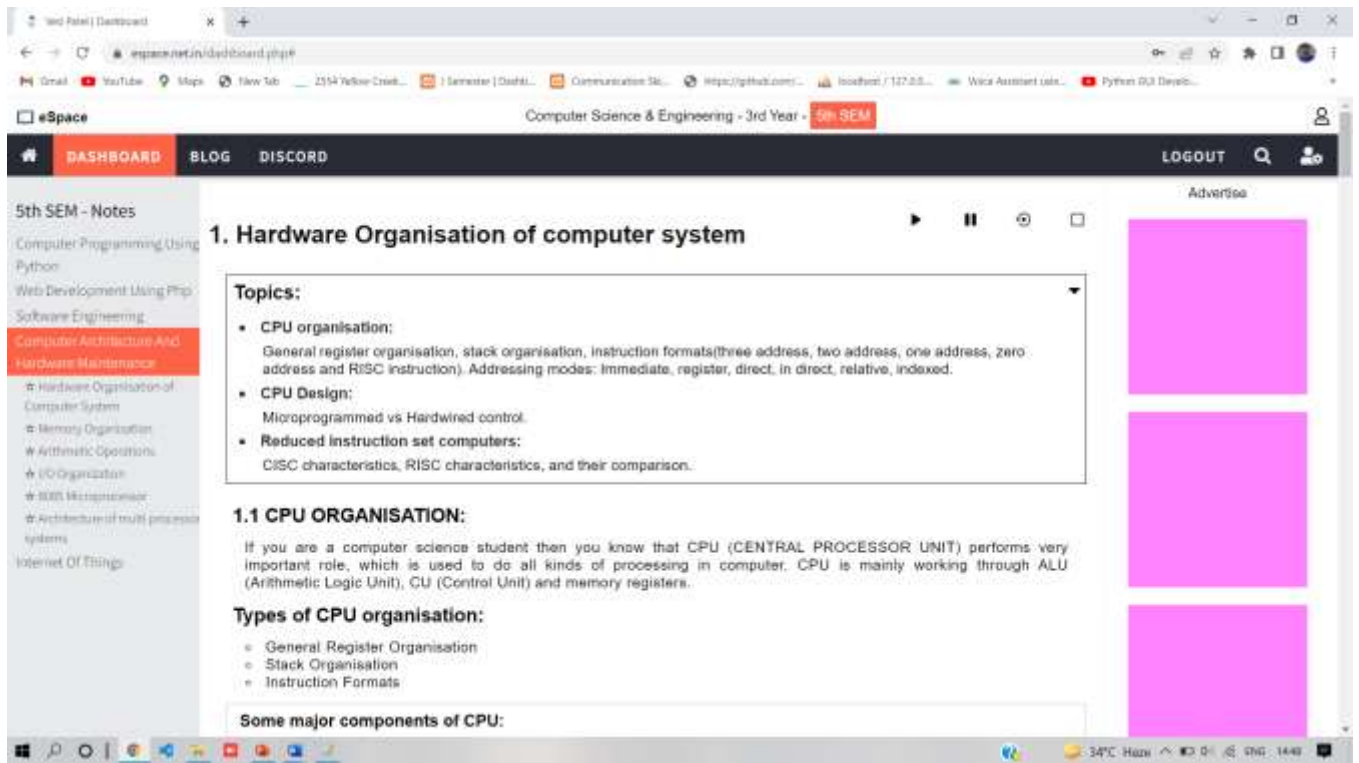
Screenshot 4: Blog Page



Screenshot 5: Dashboard



Screenshot 6: Notes Section



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- YouTube Channels referred

- ✦ CodeWithHarry
- ✦ freeCodeCamp

THANK YOU