

Graphical user interface, text

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**A MINI PROJECT REPORT ON**

**Online Course Management System**

*Submitted to Visvesvaraya Technological University in partial fulfillment of the requirement for the award of degree of*

***Bachelor of Engineering***

***in***

***Computer Science and Engineering.***

**Submitted by:**

Mr.Manjush V G 4JN19CS050

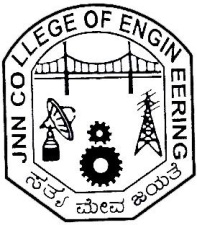
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**March 2022**

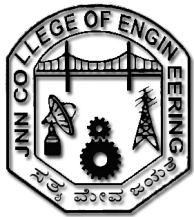
Department of Computer Science & Engineering

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Shivamogga - 577 204

**National Education Society ®**





Jawaharlal Nehru New College of Engineering

Department of Computer Science & Engineering

**CERTIFICATE**

*This is to certify that the Mini-project Report entitled*

**Online Course Management System**

**Submitted by:**

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*Students of 5th semester B.E under the supervision and guidance towards the partial fulfillment of the requirement for award of degree of the Bachelor of Engineering in Computer Science and Engineering of Visvesvaraya Technological University, Belgaum during the year 2021 – 2022.*

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**Abstract**

A database management system (DBMS) is a software package with computer programs that control the creation, maintenance, and use of database. It allows organizations to conveniently develop database for various applications by database administrators (DBAs). A database is an integrated collection of data.

The online course management system mini project provides and manages various activities of an institution such as uploading course by the faculty, paying the fee for the course by the student to the institute, and approving the payment by the institute. The online course management system software is a Django, html-CSS, JavaScript, and MySQL built system that manages the activities among student, faculty, and institute. It provides respective functionalities for students, faculties, and institutes. It allows new students, faculties, or institutes to register. And allows existing students, faculties, or institutes to login. A student can enroll for a course by paying the fees to the institute. A student can add a course to Wishlist. A faculty can upload the course to the website. An institute can approve the payment done to their account number. This project is built keeping in mind various activities related to online course management and the software automates all the required functionalities.



Acknowledgement

On presenting the Database Management Systems Mini Project report on "**Online Course Management System** ", I feel great to express my humble feelings of thanks to all those who have helped me directly or indirectly in the successful completion of the project work.

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**Chapter**-1

**Introduction**

* 1. **Overview Of Online Courses**

**Online course** is education that takes place over the Internet. They are generally conducted through a learning management system as our project, in which students can view their course syllabus and academic progress. **Online courses** are generally self-paced, allowing for greater flexibility in completing coursework.

* 1. **Applications**

As everything is being digitalized the online course management application promotes the online courses and attracts the students towards these courses. This grows the skills and knowledge of the students. It helps the students to understand the subject in depth and crack exams. This helps faculties to reach a large number of students.

* 1. **Problem Statement**

Nowadays’ the world of education and learning is moving towards online. Every student may not have a good bandwidth and they may face network issues if the teaching is live. So, for those students who do not have a good bandwidth, concepts will not be clear.



* 1. **Objectives**
* Main objective of Online Course management system is to provide simple, universal access to information and services for students, faculty, and universities.
* Our aim is to give best service to the users who wants to get knowledge from our online platform.
* 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. **Overview of Django**

Django is a high-level Python web framework that enables rapid development of secure and maintainable websites. Django is based on MVT (Model-View-Template) architecture. MVT is a software design pattern for developing a web application. MVT Structure has the following three parts – Model: The model is going to act as the interface of your data. It is responsible for maintaining data. It is the logical data structure behind the entire application and is represented by a database (generally relational databases such as MySQL, Postgres). View: The View is the user interface — what you see in your browser when you render a website. It is represented by HTML/CSS/JavaScript and Jinja files. Template: A template consists of static parts of the desired HTML output as well as some special syntax describing how dynamic content will be inserted.

**Features of Django**: -

* **Rapid Development**: - Django was designed with the intention to make a framework which takes less time to build web application. The project implementation phase is a very time taken but Django creates it rapidly.
* **Secure**: - Django takes security seriously and helps developers to avoid many common security mistakes, such as SQL injection, cross-site scripting, cross-site request forgery etc. Its user authentication system provides a secure way to manage user accounts and passwords.
* **Scalable**: - Django is scalable in nature and has ability to switch from small quickly and flexibly to large scale application project
* **Fully loaded**: - Django includes various helping task modules and libraries which can be used to handle common Web development tasks. Django takes care of user authentication, content administration, site maps, RSS feeds etc.



* **Versatile**: - Django is versatile in nature which allows it to build applications for different-different domains. Now a days, Companies are using Django to build various types of applications like content management systems, social networks sites or scientific computing platforms etc.
* **Open Source**: - Django is an open-source web application framework. It is publicly available without cost. It can be downloaded with source code from the public repository. Open source reduces the total cost of the application development.
* **Vast and Supported Community**: - Django is a one of the most popular web frameworks. It has widely supportive community and channels to share and connect.
  1. **Overview of MySQL**

SQL (Structured Query Language) queries. Architecture of MYSQL describes the relation among the different components of MYSQL System. MYSQL follow Client-Server Architecture. It is designed so that end user that is Clients can access the resources from Computer that is server using various networking services. The Architecture of MYSQL contain following major layer’s:

• Client

• Server

• Storage Layer

**Features of MySQL: -**

* MySQL is a relational database management system. This database language is based on the SQL queries to access and manage the records of the table.
* MySQL is easy to use. We must get only the basic knowledge of SQL. We can build and interact with MySQL by using only a few simple SQL statements.
* MySQL consists of a solid data security layer that protects sensitive data from intruders. Also, passwords are encrypted in MySQL.
* MySQL follows the working of a client/server architecture. There is a database server (MySQL) and arbitrarily many clients (application programs), which communicate with the server; that is, they can query data, save changes, etc.
* MySQL supports multi-threading that makes it easily scalable. It can handle almost any amount of data, up to as much as 50 million rows or more. The default file size limit is about 4 GB. However, we can increase this number to a theoretical limit of 8 TB of data.
* MySQL is considered one of the very fast database languages, backed by many the benchmark test.
* MySQL supports many embedded applications, which makes MySQL very flexible.
* MySQL is faster, more reliable, and cheaper



**Chapter-2**

**Design and Implementation**

**2.1. Functional Requirements**

* **Search**

Search feature will allow a user to find the courses based on the topic, specialization, skills that he/she wants to acquire, instructor who taught the course or the courses which belong to an institute.

* **Wishlist**

A student can add courses to Wishlist. Later he/she can enroll that course.

* **Enroll**

A student could enroll to any course, if the course provided by the same institute to which the student belongs then the course will be enrolled for free else, they must pay the fees for the course.

* **Progress**

This website will also keep track of students' progress in the course. If the student watches up to 95% of the video, then that video will be marked as completed.

* **Upload**

A faculty can upload courses to the website. After uploading he/she can see the number of views for his/her course, number of students who have enrolled for the course and the rating of the course.

* **Approve**

An Institute must verify whether the student studies in their institute or not and the institute has to approve the enrollment of the course for a student after the payment.



**ER Diagram**

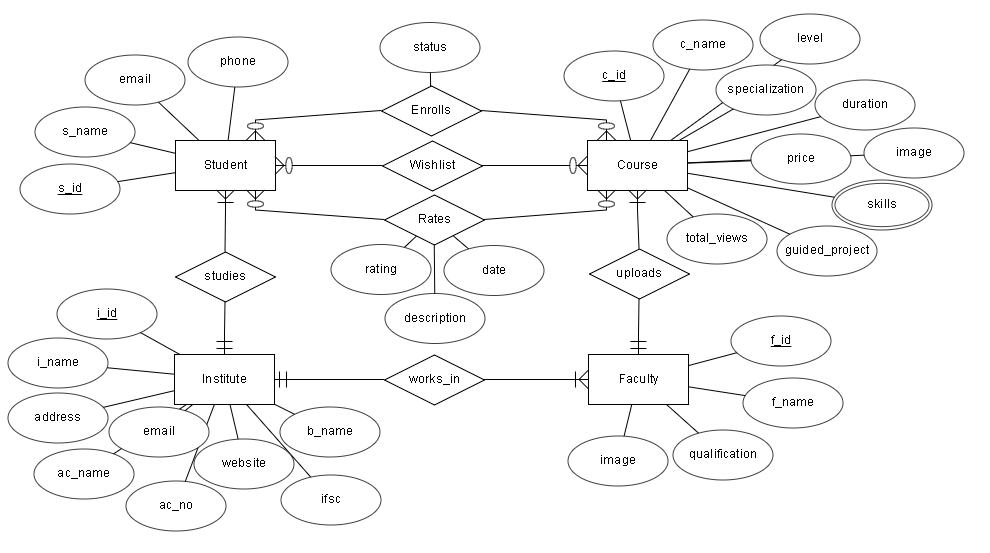
The below figure shows the ER diagram and ERD is a model that identifies the concepts or entities that exist in a system and the relationships between those entities.

Figure 2.1

**Entities**

* **Institute: -**

This entity stores Institute details such as name, address, email, image, institute website link, account number, IFSC, account holder name. i\_id is the primary key. email is used for login. Bank account details is needed because the students must pay the fees for the institute to get access for a course.

* **Faculty: -**

This entity stores the faculty details such as name, qualification, image, i\_id. Here f\_id is the primary key. i\_id is the foreign key which refers to the institute to which the faculty works for. Faculty will upload the courses.

* **Student: -**

This entity stores Student details such as name, email, phone number. s\_id is the primary key. i\_id is the foreign key which refers to the institute in which the student studies. A student can add a course to Wishlist, and he/she can enroll for the course by paying the fees. After completing the course, he/she can give the rating for that course which would help other students.



* **Course: -**

This entity stores many attributes related to a course such as name, description, playlist\_id, specialization, level, skills, duration, price, image, total\_views, guided\_project, date, no\_videos, rating. c\_id is the primary key. f\_id is the foreign key which refers to the faculty who has uploaded the course. playlist\_id stores the playlist id of the YouTube playlist which is unlisted (playlist can be accessed only through link). skills attribute is multivalued attribute. no\_videos will store the number of videos in the playlist, duration will store the total duration of the playlist and values of both attributes are calculated before inserting a course using the YouTube data API v3. guided\_project is Boolean attribute which will store 1 if the course is guided project else 0. Initially rating will be zero, when a student gives a review then the trigger which we have created will be fired and the rating will be updated.

**Relationship between Entities**

* Student—Enrolls—Course

**Constraint** **Cardinality ratio**

**Student** Optional Many

**Course** Optional Many

* Student—Wishes—Course

**Constraint** **Cardinality ratio**

**Student** Optional Many

**Course** Optional Many

* Student—Rates—Course

**Constraint** **Cardinality ratio**

**Student** Optional Many

**Course** Optional Many

* Student—Studies in—Institute

**Constraint** **Cardinality ratio**

**Student** Mandatory Many

**Institute** Mandatory One

* Faculty—Works in—Institute

**Constraint** **Cardinality ratio**

**Faculty** Mandatory Many

**Institute** Mandatory One



* Faculty—Uploads—Course

**Constraint** **Cardinality ratio**

**Faculty** Mandatory One

**Course** Mandatory Many

**2.2. Design**

**Schema diagram:**

* Schema diagram is a skeletal structure that represents the local view of the entire database.
* Pointed arrow is used here to represent the foreign keys of tables (attribute at the head of the arrow represents parent key and attributes at the tail represents child key).

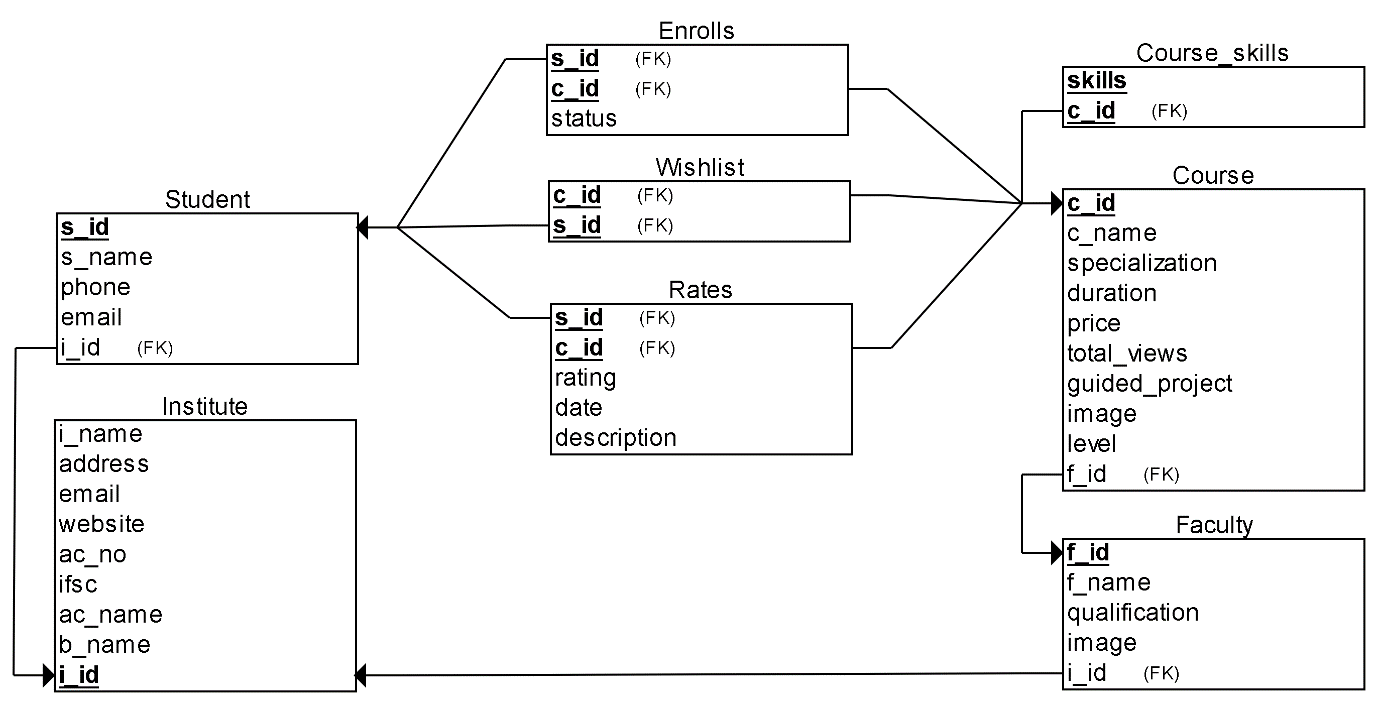


Figure 2.2



**2.3. HTML**

* HTML stands for Hyper Text Markup Language.
* HTML is the standard markup language for creating Web pages.
* HTML describes the structure of a Web page.
* HTML consists of a series of elements.
* HTML elements tell the browser how to display the content.

**HTML TAGS**

* The <!DOCTYPE html> declaration defines that this document is an HTML5 document.
* The <html> element is the root element of an HTML page.
* The <head> element contains meta information about the HTML page.
* The <title> element specifies a title for the HTML page (which is shown in the browser's title bar or in the page's tab).
* The <body> element defines the document's body, and is a container for all the visible contents, such as headings, paragraphs, images, hyperlinks, tables, lists, etc.,
* The <h1> element defines a large heading.
* <p> element defines a paragraph.

**Examples: -**

**<p>**Paragraph**</p>**

**<h2>**Heading tag**</h2>**

**<b>**Bold**</b>**

**<i>**Italic**</i>**

**<u>**Underline**</u>**

**<br>**Tag: br stands for break line, it breaks the line of the code.

**<hr>** Tag: hr stands for Horizontal Rule. This tag is used to put a line across the webpage

**W3.CSS**

* W3.CSS is a modern framework with built-in responsiveness and easy to learn and use compared to other CSS frameworks.
* It aims to speed up and simplify web development and support modern responsive devices like Mobile, Laptop, Tablet and Desktop.
* W3.CSS was designed to be a high-quality alternative to Bootstrap.



* W3.CSS is free for everyone to use. Anyone can use it by simply linking the style in their webpage.

**2.4. Django MVT System**

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**Figure 2.3**

The MVT (Model View Template) is a software design pattern. It is a collection of three important components Model, View and Template.

**Model:** This is an abstraction layer for structuring and manipulating the data of the Web Application. It acts as an interface for maintaining data. This is a logical data structure behind the entire application and helps to handle the database.

**View:** This layer encapsulates the logic responsible for processing a user’s request and returns a response. It is a user interface to execute the logic and interact with the models. It is responsible for displaying all or a portion of data to the user.

**Template:** The template layer provides a designer-friendly syntax for rendering the information to be presented to the user. It contains the static parts of the desired HTML output 16 along with some special syntax, also known as Django Template Language (DTL), describing how dynamic content will be inserted.



**2.5. Django Admin Interface**

Django provides an admin site to allow CRUD (Create Read Update Delete) operations on registered app model. It is a built-in feature of Django that automatically generates interface for models. We can see the URL entry for admin in urls.py file, it is implicit and generated while creating a new project.

1. urlpatterns = [
2. path('admin/', admin.site.urls),
3. ]

It can be easily accessed by after login from the admin panel, lets run the server python3 manage.py runserver and access it through the localhost:8000/admin.

A login form will be displayed,

Graphical user interface, application, website

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Figure 2.4

To login, first create admin (super user) user and provide password as we did here:Text

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Figure 2.5



Super user is created successfully, now you can login with the username and password that you have given while creating the superuser. After login you will see a page as shown below:

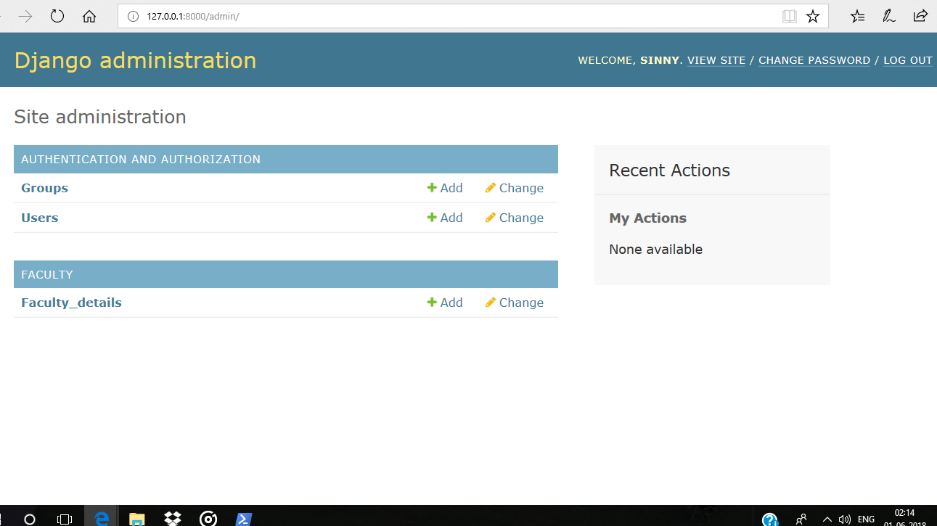


Figure 2.6

It is an admin dashboard that provides facilities like creating groups and users. It also used to manage the models.



**2.6. Implementation**

**2.6.1 Flowchart for Student, Faculty, Institute registration:**

Start

Collect faculty name, email id, phone no , qualification, institute, image, password

Collect student name, email id, phone no, institute, password

Collect institute, Address, image, email, website

Add collected data

to backend

Stop



**2.6.2 Flowchart for user login**

Start

Collect email id, Password

False

Check whether email name & Password are present in backend

True

Display user part page

Stop



**2.6.3 Flowchart for user part page:**

Start

Collect email id, Password

False

Check whether email name & Password are present in backend

True

Display user part page

Stop



**2.6.4 Flowchart for user part page:**

Start

If user click explore button

True

Display explore page

False

If user click my course button

True

Display mycourse page

True

False

If user click wishlist button

True

Display wishlist page

Stop



**2.7. APIs used**

|  |  |
| --- | --- |
| **YouTube Data API V3** | |
| **APIs used** | **Explanation** |
| playlistItems().list() | In this function we have passed four parameters: part, playlistId, maxResults and pageToken.  part is string which contains comma separated playlistItem resource properties. We have used contentDetails (to get video ids of all videos in the playlist) and snippet (to get title, description, and thumbnail of each video of the playlist) properties in part.  With a single request we can fetch maximum of 50 objects of the given properties. If the playlist has more than 50 videos, then we will get nextPageToken (page token of next page) in the response. Now we can use this token as a parameter to fetch next 50 videos. |
| Videos().list() | In this function we have passed two parameters: part, id.  Here part contains videos resource properties. We have used only one property that is contentDetails (to get duration of video whose id is given).  id is string which contains comma separated video ids. We can fetch duration of multiple videos (maximum of 50) at a single time. |

Table 2.1

|  |  |
| --- | --- |
| **YouTube Player API** | |
| **APIs used** | **Explanation** |
| YT.Player() | This function is used to create a Player object. This function will take two parameters: first parameter is DOM element or id of HTML element where the API will insert <iframe> tag containing the player, and second parameter is a JavaScript object which specifies the player options.  The object contains the properties such as width, height, videoId, playerVars, events.  playerVars is an object which contains player parameters such as rel (related videos), autoplay, controls etc. These parameters are either set to 0 or 1.  Events is an object which contains events and their corresponding handler functions. |
| playerObj.getDuration() | Here playerObj is the object that we created using above function. The function getDuration will return the duration of the playerObj video in seconds. |
| playerObj.getCurrentTime() | This function will return the current playing time of the playerObj video in seconds. |

Table 2.2



|  |  |
| --- | --- |
| **Django APIs** | |
| **APIs used** | **Explanation** |
| request.GET.get | request.GET contains the GET variables. These are what you see in your browser's address bar. The. get() method is a method used for dictionaries . |
| Request.POST.get | request.POST contains the POST variables. This function is used to get the variables that are sent with http post request. |
| objects.filter | Objects.filter is to get a matching result from the database, return a list of objects. |
| objects.get | It is a method of accessing objects in python. It returns the value associated with that object. |
| objects.raw | This method takes a raw SQL query, executes it, and returns a django.db.models.query.RawQuerySet instance. This RawQuerySet instance can be iterated over like a normal [QuerySet](https://docs.djangoproject.com/en/4.0/ref/models/querysets/" \l "django.db.models.query.QuerySet" \o "django.db.models.query.QuerySet) to provide object instances. |
| objects.set\_cookie | The set\_cookie() method in DjangoHttpResponse has a name: Name of the cookie.value: Value you want to store , int or string but it will return string. |
| request.COOKIES.get | Using request.COOKIES.get () Django also provides a method to get the desired value from the cookie. You can directly access that value using get method over request object. |
| objects.latest | Returns the latest object in the table based on the given field(s). |
| objects.create | To create and save an object in a single step, we can use the [create()](https://docs.djangoproject.com/en/4.0/ref/models/querysets/#django.db.models.query.QuerySet.create) method. |

Table 2.3



**Chapter 3**

**Results**

**3.1 Explore**

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Figure 3.1

It is the main page of our mini project which contains student, faculty, institute login button and complete course details.

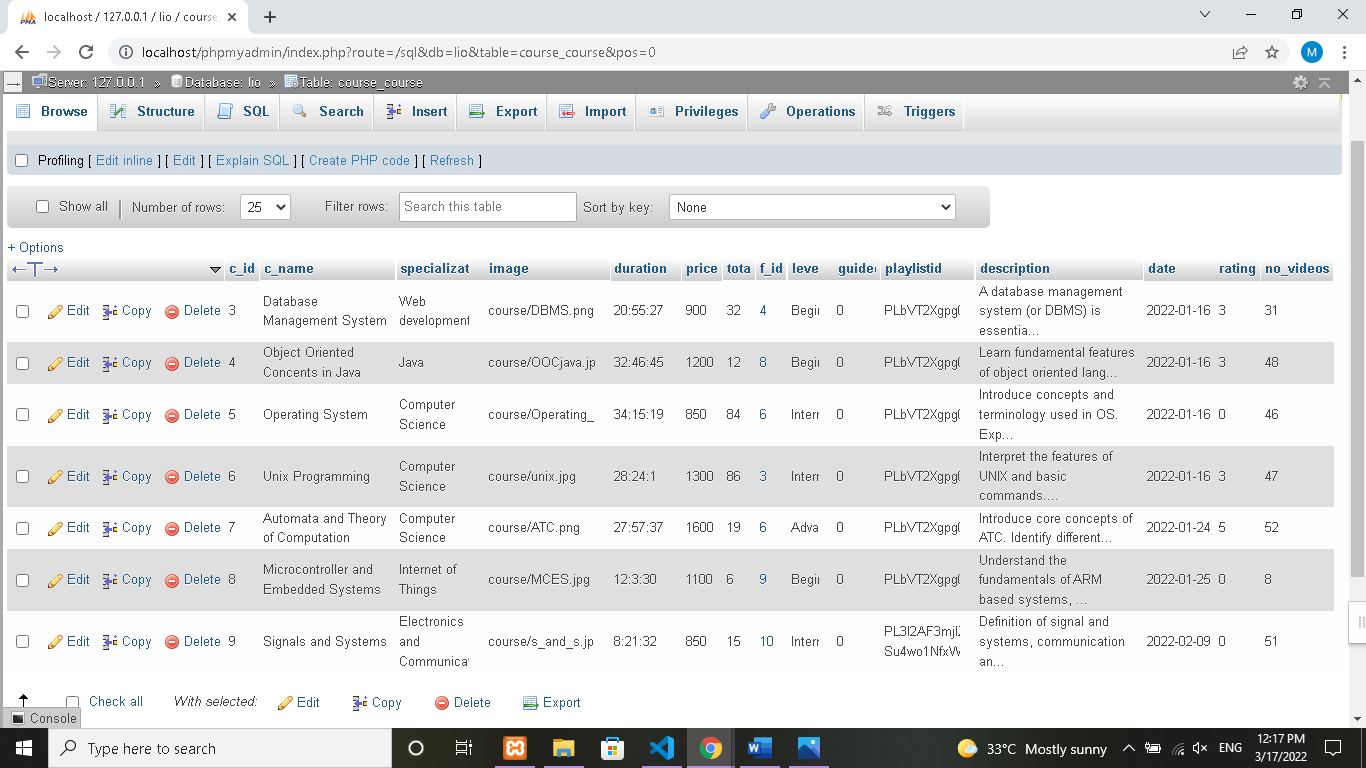
****



Figure 3.2

This picture shows the course table. This table consists of course id and course name, specialization, image, duration of course, price, faculty id, levels whether it is for beginners, intermediate or advanced, guided projects, playlist\_id, description of course, uploaded date, ratings, total number of videos.

**3.2 Search**



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Figure 3.3

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Figure 3.4



**Graphical user interface, application

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There is a search feature which will take a keyword as an input and returns courses which has that keyword. Apart from searching the courses by their title and description, this feature will also search the courses which belong to a particular institute as shown in the Figure 3.3. It also searches the courses which are thought by a particular lecturer as shown in the Figure 3.4. It also searches the courses which teaches a particular skill as shown in the Figure 3.5.

**3.3 Course Details**



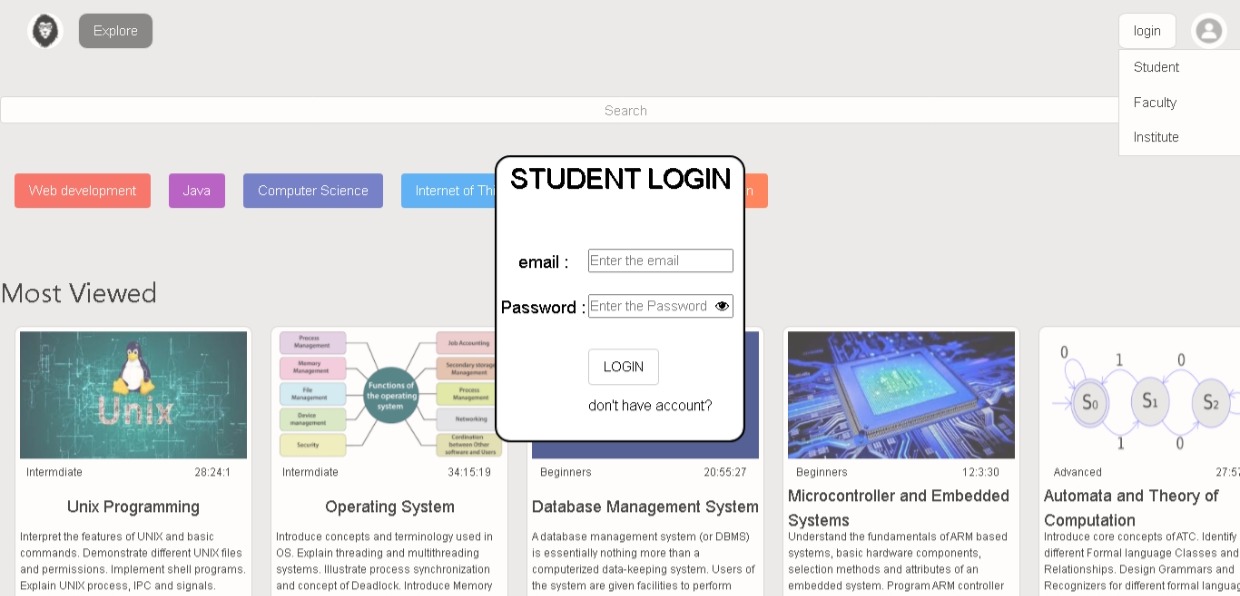
**Graphical user interface, application, Teams

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This page contains detailed information of a course, the faculty who has thought this course, the institute to which this course belongs, ratings and feedback details given by the students who have already enrolled for this course. Student can add this course to Wishlist or enroll to this course.

**3.4 Login and Register**



****Figure 3.7

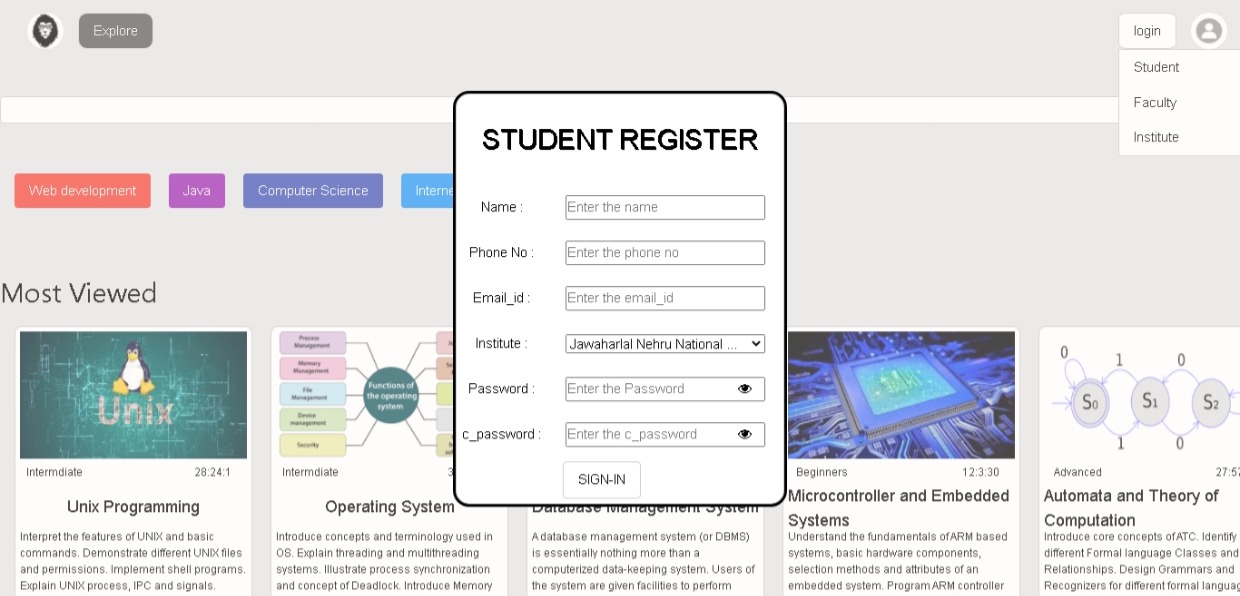
****

Figure 3.8

Figure 3.7 and Figure 3.8 shows the login and register page for students respectively. The student has login with his credentials before accessing my courses page and Wishlist page. If a student is not yet registered then he can register himself by giving some details such as name, email, phone number, and the institute in which he studies. Similarly faculty and institute can also register themselves and login.

**3.5 Student**



**Graphical user interface, text, application, email

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Figure 3.9 shows the student table. This table stores students’ details such as name, email, phone number, institute id of the institute in he studies, and it also stores the password which is hashed.

Figure 3.10 shows the explore page after a student is logged in. When a student is logged in then he is redirected to explore page where his name will be displayed. This page will also give a list of courses which will be free for him. These are the courses which are from the institute in which the student studies. Every student gets the courses uploaded by his institute for free.

Application

Description automatically generated with medium confidenceFigure 3.10



**3.5.1 My Courses**

Graphical user interface, website

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Figure 3.11 shows my courses page of a student. It includes all the courses to which the student has enrolled. The enrollment details are stored in a database table as shown in the Figure 3.12. It stores the student id of the student, course id of the course to which he has enrolled and the watched list which contains the indices of the video that has student has watched. My courses page shows the progress of the student in each course with the help of watched list. Figure 3.13 and Figure 3.14 shows the course page where video will be played. Right half of the page contains the list of blocks for each video in that course. Each block includes the title, description, thumbnail and duration of the video, and with a icon, it shows whether the video is watched or not.

****



Figure 3.12

Figure 3.13

**Graphical user interface

Description automatically generatedGraphical user interface, application

Description automatically generated**Figure 3.14

**Graphical user interface, text, application, email

Description automatically generated3.5.2 Ratings**



**Graphical user interface

Description automatically generated**Figure 3.15

Figure 3.16

Figure 3.15 shows the Rating table. This is the table which consists of the rating given by the students to particular course. It stores the student id of the student, course id of the course, and the rating and review the student has given for that course.

Figure 3.16 shows the rating form which is popped on clicking review button in my courses page. Using this form the student can give the rating. Only enrolled students can give the rating for the course.

**Graphical user interface, text, application, email

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**Graphical user interface, website

Description automatically generated**Figure 3.17

Figure 3.18

Students can Wishlist courses of which's data will be stored in Wishlist database.id will be given to every course wish listed by student separately and it will act as primary key to select every row of database independently. Data bases consist of id, c\_id\_id, s\_id\_id table which stores id of given to wish listed course, course id and student id respectively

When student login with id, he will be directed to explore page. Students can Wishlist courses which he wants, and it could be seen in Wishlist page. Whenever student want to enroll the course, he will click on to thumbnail and he can enroll.

**Graphical user interface, text, application

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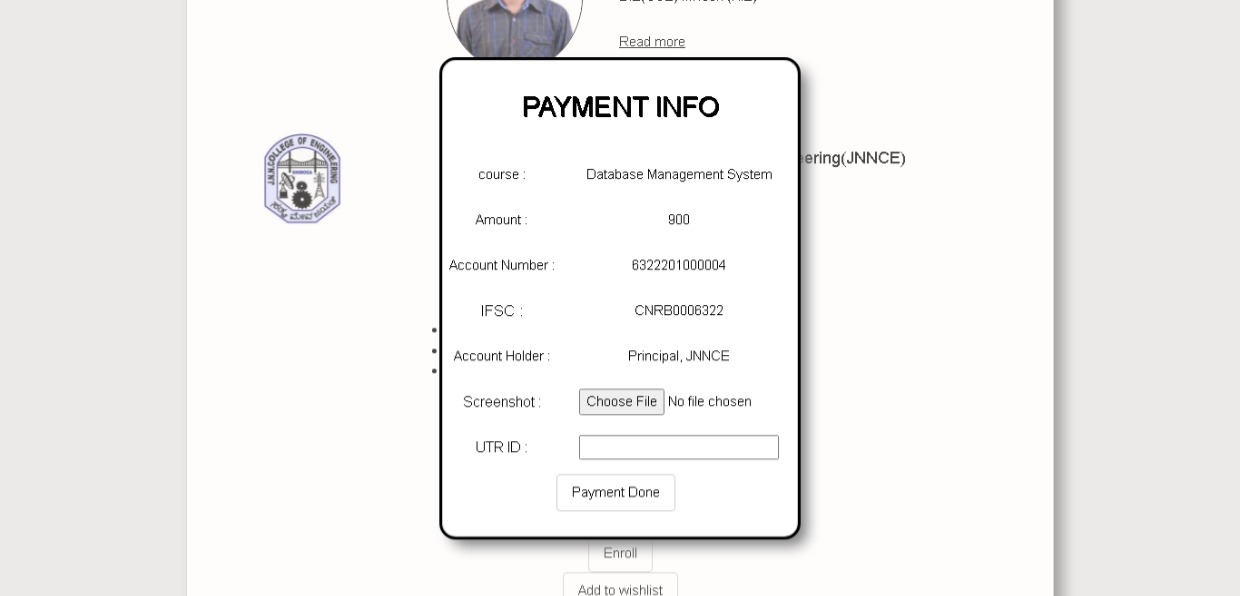
****Figure 3.19

Figure 3.20

Whenever student want to buy some course, he will click on the enroll button and he will be directed to payment form. Where he should upload screen shot and UTR number of transaction and clicks on payment done button to enroll the course.

**3.6 Faculty**



**Graphical user interface, text, application, email

Description automatically generated**Figure 3.21

Faculty database will consist of all data including faculty id, faculty name, faculty qualification, image of faculty, password, i\_id\_id, email, phone number of faculty in f\_id, f\_name, qualification, image, password, i\_id\_id, email, phone table.

**3.6.1 My courses**

When lectures login with their IDs. Page will be directed to explore page. When they click on My courses, page My courses will opens which contains all the videos which are uploaded by particular lecturer. There will be upload button. On clicking that, Upload form will opens where user has to give all necessary information and can upload the video.

**Graphical user interface, text, application

Description automatically generated**



Figure 3.22

**3.6.2 Upload**

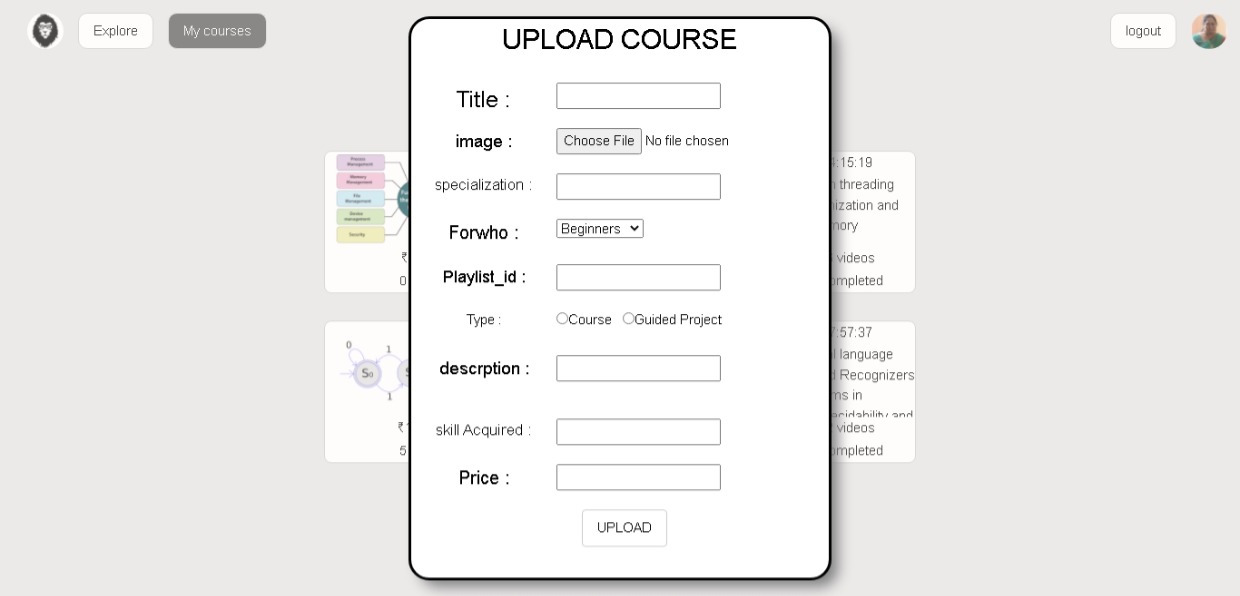
****

Figure 3.23

When lectures login with their IDs and want to upload the video then it will be facilitated by 'upload' page. Where he have to give Title, Thumbnail, specialization, Forwho, playlist id of YouTube, description, skill acquired by course, price.

**3.7 Institute**



**Graphical user interface, text, application, email

Description automatically generated**Figure 3.24

Data base of institutions which have i\_id, i\_name, address, image of institution, email address, website, ac\_name, ac\_no, b\_nam, ifsc, password. This data table will have information which will be necessary to identify institution, it's courses and to make transactions.

**3.7.1 Approvals**

This page belongs to institutions. When institution login with their IDs, they will get Explore and Approval page. In Approval page they see all the applications of students who want to enroll for particular course. If students are from same institution then they will get some offers otherwise institutions will have approve explicitly.



**Graphical user interface, text, application, email

Description automatically generated**

Figure 3.25

**Graphical user interface, application, Word

Description automatically generated**

Figure 3.26

**3.8 Form Errors**



**Graphical user interface, text, application

Description automatically generated**Figure 3.27

If the user commits any error while filling the form, then the error block will be displayed after submitting that form as shown in the above figure.

**Chapter – 4**



**Conclusion and Future Scope**

The problem in live class is that there is no guaranteed bandwidth which causes packet loss and this effects the continuity of the class. But in online learning as our project, videos are prerecorded and available at any time. Therefore, it is time flexible. Since the videos are prerecorded, if there is any packet loss then they can just go back few seconds in the video. And these courses are self-paced. Once the student is enrolled for a course then he can watch the videos any number of times.

**Future Scope:**

* A feature for users to change their passwords, image, phone number.
* A feature for faculty to update the title, description, skills, price, level (for who). And a feature to update the number of videos and duration if they have added or removed a video from the playlist.
* A feature where the faculty can add assignments while uploading the course or can add it by updating an existing course.
* A feature where the institute has to verify that the faculty or student who claims to work or study in their institute respectively is true.
* A feature where the institute can provide the certificate to the students who completes the course.



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