



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

MOBILE APPLICATIONS DEVELOPMENT								
I Semester: Common for CSE / CSE(DS) / CSE(CS)								
II Semester: Common for CSE (AI&ML) / IT								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACSD04	Skill	L	T	P	C	CIA	SEE	Total
		0	0	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45			Total Classes: 45			
Prerequisite: Object Oriented Programming								

I. COURSE OVERVIEW:

This course focuses on hands-on experience in designing, developing, and testing mobile applications for various platforms. It helps to gain practical skills in mobile app development, including user interface design, memory management, input methods, data handling, network techniques and URL loading. Students will be able to undertake engineering challenges such as designing and developing mobile applications.

II. COURSES OBJECTIVES:

The students will try to learn

- I. The mobile application development for different platforms using appropriate tools and frameworks.
- II. The user interface design with best practices for usability and user experience.
- III. The process of debugging and troubleshooting for common issues in mobile app development.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

- CO 1 Apply layout management and multi layout techniques to create adaptable user interface.
- CO 2 Develop user interface for mobile application using widgets with event handling.
- CO 3 Design push notifications for incoming messages.
- CO 4 Create mobile application models using appropriate range of methods provided.
- CO 5 Evaluate applications on mobile platforms with different configurations.
- CO 6 Deploy applications to the android marketplace for distribution to app store.

IV. COURSE CONTENT:

GETTING STARTED AN EXERCISES

1.1 HELLOWORLD

1. Flutter and Kotlin are the two leading technologies used to build mobile applications. Kotlin has an easy learning curve because it is very similar to Java. In Flutter, developers must have to learn Dart programming to build an app.
2. In this laboratory students can use either kotlin / flutter.
3. Install Android studio, visual studio with kotlin / flutter on your machine.
4. Write a Hello-world program using android studio and kotlin / flutter source-code editor.

1.2. FOOD ORDERING APPLICATION

Build a food ordering application with the following functionalities:

1. A 'Welcome page' which displays the logo and/or name of the app.
2. A 'Login Page' which asks for users' mobile number and password.
3. A 'Registration Page' which enables users to sign up for the app.
4. A 'Forgot Password Page' which enables users to reset their password.
5. A 'Navigation Drawer' with the app logo and user name on top and menu options to open the following pages:
 - a. Home
 - b. User Profile
 - c. Favorite Restaurants
 - d. Order History
 - e. Frequently Asked Questions (FAQs)
 - f. Log out
6. A 'My Profile' page (where the user's name, phone number, and address is displayed).
7. A 'Favorites' page (where the list of all favorite restaurants is displayed).
8. An 'Order History' page which lists the previously placed orders of the user.
9. An 'FAQ' page which lists some frequently asked questions. You can create any random questions which you feel could be relevant for a food delivery application. (Min. 5 questions)
10. A 'Logout' functionality which takes the user to the login page.
11. A 'Restaurant Details' page which displays the menu items of that particular restaurant, each item's price and the option to add an item to cart.
12. A 'Cart' page which lists the items added to cart and the total amount to be paid.

See also for authentic understanding, click the link <https://www.swiggy.com>; <https://www.zomato.com/deliver-food>; <https://www.ubereats.com>; <https://www.dineout.co.in> and so on. Each student has to refer any one of the web sites stated above.

2. MUSIC PLAYER APPLICATION

Build a music player application with the following functionalities:

1. A 'Splash screen' (gradient background and app logo in center)
2. A 'Navigation drawer' with app logo section at the top along with links to 'All Songs', 'Favorites', 'Settings' and 'About Us'.

3. An 'All songs' screen (where of list all the tracks fetched from offline storage are displayed and user can sort the tracks by name or recently added). This will be the home screen of the app.
4. The app should be able to fetch and play .mp3 and .wav files.
5. A 'Favorites' screen (where list of all the favorite songs is displayed)
6. A 'Settings' screen (where the 'Shake to change song' feature can be enabled or disabled)
7. An 'About us' screen (where we will display information about the app developer and the app version)
8. A 'Now playing' screen with following features:
 - a. Track title and track artist
 - b. Play / Pause button
 - c. Next button
 - d. Previous button
 - e. Shuffle button
 - f. Loop button
 - g. Seek bar
 - h. Mark track as favorite or unfavorite it
 - i. Third party visualizer in upper half background
 - j. A 'Back to list' button in the header which should take the user to the screen he came from (kind of like back button behavior).
 - k. Shake to change song
9. A 'Now playing' bar at the bottom with name of the track playing and play or pause feature. This would appear if the user has moved from 'Now playing' screen to 'All songs' screen or 'Favorites' screen without pausing the track.
10. Background play. The app will continue playing the track if the app gets closed (not killed) without the music being paused.
11. A notification saying "A track is playing in the background" only if the app gets closed (not killed) without the music being paused.
Primary color scheme: #9b2a58, #00032a

See also for authentic understanding, click the link <https://open.spotify.com>; <https://gaana.com>; <https://www.hungama.com>; <https://wynk.in/music> and so on. Each student has to refer any one of the web sites stated above.

3. SMART HEALTH PREDICTION

Build Android Smart Health Prediction application which can be used by all patients or their family members who need help in emergency with the following functionalities:

This application comprises of 3 major modules with their sub-modules:

1. A 'User page' with menu options to open the following pages:
 - a. A 'Patient Login page' which displays patient Login to the application using his ID and Password.
 - b. A 'Patient Registration page' which asks if patient is a new user, he will enter his personal details and he will use Id and password through which he can login to the application.
 - c. A 'My Details page' which patient can view his personal details.
 - d. A 'Disease Prediction page' patient will specify the symptoms caused due to his illness. Application will ask certain question regarding his illness and application predict the disease based on the symptoms specified by the patient and application will also suggest doctors based on the disease.
 - e. A 'Search Doctor page' which the patient can search for doctor by specifying name, address or type.
 - f. A 'Feedback page' which the patient will give feedback this will be reported to the admin.
 - g. A 'Notification page' which the user needs to enter his/her prescription and then the user need to select a time on which he/she wants to receive notification. The application will send the notification regarding the prescribed medicine to the user on their device.
2. A 'Doctor page' with menu options to open the following pages:
 - a. A 'Doctor Login page' will access the application using his User ID and Password.
 - b. A 'Patient Details page' can view patient's personal details.
 - c. A 'Patient's Previous Details page' will get all information about patient's previous case history. That will help him to serve him better.
3. A 'Admin page' with menu options to open the following pages:
 - a. A 'Admin Login page' can login to the application using his ID and Password.
 - b. A 'Add Doctor page' can add new doctor details into the database.
 - c. A 'Add Disease page' can add disease details along with symptoms and type.
 - d. A 'View Doctor page' can view various Doctors along with their personal details.
 - e. A 'View Disease page' can view various diseases details stored in database.
 - f. A 'View Patient page' can view various patient details who had accessed the application.
 - g. A 'View Feedback page' can view feedback provided by various users.

See also for authentic understanding, click the link <https://www.apollohospitals.com>; <https://nirogstreet.com>; <https://www.lybrate.com>; <https://www.portea.com> and so on. Each student has to refer any one of the web sites stated above.

4. HOSTEL MANAGEMENT APPLICATION

Develop the hostel management application which will help to manage the hostel. The hostel managers can keep track of the hostellers' in and out timings and their daily entries. This system is intended to help hostel admin by allowing them to save student records and information about their rooms. It helps the admin from the manual work from which it is very difficult to find the record of the students.

This application comprises of following functionalities:

1. A 'Admin page' with menu options to open the following pages:
 - a. A 'Manage Rooms' page which the admin can choose to add general rooms or bedrooms to the system. If the admin chooses a bedroom, they can add beds. They can add, update or delete rooms.

- b. A 'Manage Students' page which the admin can view, add, update or delete students from the system. They can allocate rooms to the students. Also, they can view the attendance of a student.
 - c. A 'View Attendance' page which the admin can filter by date AND room OR student-id. They can view all the student's attendance.
2. A 'Student page' with menu options to open the following pages:
- a. A 'Login' page which the student can log in to the system using a username and password.
 - b. A 'Profile' page which the student can add or update their profile details.
 - c. A 'Change Password' which they can also change their password to the new one.
 - d. A 'Home' page the student can scan the QR Code and a log will be added. They can view their room allocation details.
 - e. A 'View Attendance' page the students are able to view only their attendance, they can also filter it by date.
3. A 'Guardian page' which the ward wishes to go out from campus for any purpose, the guardian will login through the registered login then the guardian will send the permission request to warden's android phone by specifying the purpose and also duration. After successful sent, the message is available in the warden login for further action.
4. A 'Warden page' after receiving the guardian's message, warden has a choice with options approve and reject. Based on the purpose of out campus, Warden Selects approve or reject. If approves then the message with the ward details is sent to security check which indicates the request made by the guardian is permitted.

See also for authentic understanding, click the link <https://www.hostelsnap.com>; <http://www.ifnoss.com/edu/college-university-software/hostel-management-system.aspx>; <https://www.ezeetechsys.com/absolute>; <https://www.resbird.com> and so on. Each student has to refer any one of the web sites stated above.

5. STAY SAFE WOMEN SECURITY APPLICATION

Build stay safe women security project is used to provide highly reliable security system for the safety of women. The proposed system is based upon advanced sensors and GPS. The basic aim of the system is to develop a low-cost solution for GPS based women tracking system (Women Safety System). The main objective of the system is to track the current location of the person which has an android enabled mobile by extracting the longitude and latitude of that target person.

This application comprises of following functionalities:

1. A 'Scream Alarm' page used perfect for the females as well as other users that need some kind of safety alarm in case, they found out that someone is following or stalking them. It also consists of two other types of scream alarm. It's an initial distraction which will buy some time and allow the user to escape from the trouble.
 - a. Male voice scream
 - b. Police siren.

The user could select one of his/her choice from the "Settings" of the application, as keeping in mind the two other scream alarms are also added in this application as nowadays safety and security is everybody's concern.

2. A 'Fake Call Timer' page which the fake call timer allows the user to make fake calls in the time of need. It helps user to escape from an undesirable situation citing an important call from anyone

who needs him/her urgently and rest depends upon user creativity. This feature also helps the user to escape from boring social events

In order to make a fake call the user have to select the "Fake Call" icon and after that user could write any name from which he/she wants a fake call. User could also set up the timer as per the requirement. The user could also set the default timer from the "Settings" icon of the application.

In a critical situation, the user just has to long term press the fake call button and automatically get a fake call as per the desired selected timer in the settings.

3. A 'Where Are You' which is used to find track friend. While first request is send by the sender. The sender will have to select the "Where Are You" icon and then a new dialog box of "Pick a Friend" will open up. The sender could select any friend and the request will be sent to the receiver. The receiver will accept that request from their end and a message will be sent to the receiver with the present location of the user.
4. A 'Track Me' which will track the user to view the exact dynamic location of the victim. First user have to send the Track Me request at the receivers end. The receiver will accept the request and then his/her name will appear on the friends you are tracking on the bottom of the application. The user could select that friend from there and then it will get automatically re-directed to the Google maps from where the user could view the exact location of the victim and also where's he/she heading to.
5. A 'Friends List' page which shows all the contact numbers of family and friends which are added by the user through contacts. This could be done by selecting the contact icon on the bottom right corner of the friends list.
6. A 'Settings' page which consists of the following features -:
 - a. A 'Emergency Services' page allows the Stay Safe Application to send emergency notifications and SMS with the exact location to the emergency contacts.
 - b. A 'Low Battery Alert' page alert feature allows the Stay Safe Application to send low battery alert and SMS to the emergency contacts.
 - c. A 'Set Scream Sound' page which the user could select any scream sound as per the requirement.
 - d. A 'Fake Call Timer (On Long press)' page which the user could set the fake call default timer as per the requirement.
7. A 'Emergency Distress Signal (SOS)' which the distress signal will be generated by the user in case of an emergency. In order to generate the distress, signal the user have to shake up his/her phone, then a distress signal will appear at the user end with a default timer of 5 sec. In the end distress signal will be sent to the emergency contacts added by the user at the time of registration. The application sends SMS and user details as well as the exact location of the user through a push notification at the receiver end, before sending a distress signal the user first have to turn on the emergency services from the settings of the application.

When user launches the application in his/her Android phone, the very first screen which lands is the Login Screen. First the user have to register himself by entering the details as the respective name and contact number of the user.

See also for authentic understanding, click the link <https://womensafetywing.telangana.gov.in>; <https://nirbhayaapp.com>; <https://safetipin.com>; <https://www.smart24x7.com> and so on. Each student has to refer any one of the web sites stated above.

6. CONTROLLING ANTI RAGGING APPLICATION

Controlling anti ragging system facilitate college students to register a criticism in opposition to ragging immediately. Students would be required to log in, after which they would be capable to

register their complaints. The grievance will then be dispatched to the worried authorities for well-timed action and the motion will be initiated immediately. Previous archives reveal that well timed action was once taken in every case, which in flip resulted in a fall in such cases. Now, with the launch of the app, the Ministry hopes to wipe out the exercise completely.

This application comprises of following functionalities:

1. A 'User Module' page which the person can register with the machine then he/she will get the get entry to in the app. After login done if the any ragging is happened then without delay update the details. Every other flexibility is additionally on hand right here to contact the emergency wide variety also provided.
2. A 'College Admin' page which can operate the action on the failed complaints; complaints can be considered via the admin and can take the perfect action on the complaint.
 - a. A 'Add Complaint' page users can a make complaint against ragging. In this, those who are filling complaint as to fill some fields like Accused Name, Ragging Type, Mobile Number
 - b. A 'View Complaint' page which can view the complaints made by students.

See also for authentic understanding, click the link <http://www.amanmovement.org>; <https://www.nmc.org.in/ActivitiWebClient/open/initiateAntiRaggingHome>; <https://www.antiragging.in>; <https://www.amanmovement.org/raggingmain.html> and so on. Each student has to refer any one of the web sites stated above.

7. EXTRACURRICULAR EVENT TRACKING APPLICATION

Build Extracurricular activities are sources that have long been a part of the educational system; students participate in these activities, which are not part of the standard curriculum or teaching techniques. Participation in all of these activities, or even just one of them has been linked to social and academic success. Students who engage in extracurricular activities gain from the numerous options available to them. Having better grades, higher standardized test scores and educational attainment, attending school more consistently, and having a greater self-concept were all advantages of participating in extracurricular activities.

Our Extracurricular Event Tracking System is developed to track students' hours organizing and participating in cultural events and college fests. This system keeps students updated about upcoming events and maintains track of the events they have attended and the hours they have spent organizing various cultural programs. Thereby, encouraging participation.

This application comprises of following functionalities:

1. A 'Admin' page which contains the following features:
 - a. A 'Login' page which the admin can log in using their credentials.
 - b. A Manage Course which they can add, update, view and delete courses. The courses will be BSC/MSC/Diploma/Engineering, etc. They can add total hours.
 - c. A 'Manage Students' page which the admin can add, update, view and delete students. They can assign courses to the students.
 - d. A 'Manage Events' page which the admin can add, update, view and delete events. They can add details about a particular event. They can choose courses. They can add the link to the Meet.
 - e. A 'View Records' page which to view the records, the admin can choose by course. They can view the students' list and list of records.
2. A 'Student' page which contains the following features:
 - a. A 'Login' page which the students can log in using their credentials.
 - b. A 'Dashboard' page which the students can see the hours completed or the total hours. They can see up to 5 upcoming events ordered by date and time.
 - c. A 'Calendar' page the students can see the Day/Week/Month on the Calendar.

- Day: The system will show today's events on the date. The user can also select any previous date to check any events that happened on that day.
- Week: By selecting any week, the system will show one week's dates & events.
- Month: By selecting the month, the system will show the current month's dates and events.
- d. A 'Records' page which the system will show all the events attended.
- e. A 'Profile' page which the user can view their profile and change the password.
- f. A 'Forgot Password' page which if the user forgets their password, an OTP will be sent via Email or Phone number (Any 1). They would require to enter the correct OTP and reset the password.
- g. A 'Notification' page which the system will send a notification to the user before an event starts, and the dashboard checks the event unattended or hours not completed.

See also for authentic understanding, click the link

<https://www.k12.com/parent-student-resources/extracurriculars-events>,

<https://www.tes.com/for-schools/clubs-and-events/features>,

<https://www.london.edu/masters-degrees/activities-clubs-and-groups>,

<https://preproy.com/blog/best-extracurricular-activities-for-the-engineering-applicant-and-so-on>.

Each student has to refer any one of the web sites stated above.

8. STUDENT MANAGEMENT SYSTEM

Build a student management system will have data on every student, and check the daily attendance of every student. The system comprises 3 major modules with their sub-modules as follows:

1. The 'Admin' page menu options to open the following pages
 - a. A 'Login' page the admin can log in to the system using a username and password.
 - b. A 'Manage Students' page the admin can manage student details and they can add, update and delete details. Also, add a fingerprint while adding the student's details.
 - c. A 'Manage Teacher' page admin will also add teacher's details and add, update and delete details. Teachers will be assigned subjects.
 - d. A 'Manage Grades' page can manage students' grades and add, update or delete grades.
 - e. A 'Manage Subjects' page can also manage subjects by adding, updating and deleting subjects.
 - f. A 'Manage Appointments' page applies to meet parent and waits for a reply.
 - g. A 'Appointments' page parents applied to meet the teacher/admin. The admin will respond to the parent's appointment request.
 - h. A 'Manage Leaves' page able to manage pending and past student leave. They can view a list of all the applied student's leaves. The admin can view all the pending leaves applied by parents. The admin will approve or reject the leave application. Leave Note: They will be able to send a note to the parent related to leaves.
 - i. A 'Medical Certificate' page will be able to view the medical certificate submitted by parents. They can send a note with an acknowledgement in response.
 - j. A 'View Complaint' page can view pending and replied complaints. They will be able to respond to the complaints.
 - k. A 'Warning Letters' page contains the admin can add and view a list of all students with attendance below 80% / total course work below 60%. They can send a warning letter to their parents. Admin will be able to view all warning letters and replies by parent.
 - l. A 'Attendance' page contains Entry and Exit Lecture-wise Attendance. See the attendance list of all Students grade-wise against 2 dates.
 - m. A 'Reports' page contains can view reports of all the student's attendance lists, grade-wise. They can view students' attendance reports for 2,4,6-months with lecture, entry and exit details. They can also view the academic reports of all the students.
 - n. A 'Entry/Exit' page can add entry and exit of the student biometric.

2. A 'PARENTS' page contains following features

- a. A 'Login' page can log in to the system using login credentials.
- b. A 'Profile' page can add or update details to their profile.
- c. A 'Change Password' can also change their old password to the new one.
- d. A 'Forget Password' used if they forget their login password, they can receive a link to change the password on their registered email-id.
- e. A 'Appointments' page contains the parent can apply to meet the admin/teacher and waits for their response. The parent will also receive the admin's request to meet them and they can respond to the request.
- f. A 'Leaves' page contains Parents can view all the leaves including pending leaves. They can view the list of all their applied leaves. Parents can view leaves that have not been replied to by an admin. They can also cancel their applied leaves.
- g. A 'Medical Certificate' page contains Add: Parents can upload the medical reports of their child while applying for leave. They can view all the previously uploaded lists and replies from the admin.
- h. A 'Complaint' page contains Parents can add a new complaint. They can view a list of all the complaints and replies from the admin.
- i. A 'Warnings' page list of the warning letters sent by admin and parents can respond to them.
- j. A 'Attendance' page can view their child's attendance, lecture-wise. Also, they can view the attendance list of the child against 2 dates.
- k. A 'Reports' page contains following features: Academic attendance reports can be viewed by the admin. Parents can view attendance reports of 2/4/6 Months with lecture, entry and exit details. They can also view their child's academic report.
- l. A 'Notifications' page will receive notifications such as when appointment status changes or admin applied, leaves approved/rejected, medical certificate reply, complaint reply, warning letter, student entry/exit, academic marks uploaded by teacher.

3. A 'TEACHER' page contains following features

- a. A 'Login' page can log in to the system using a username and password.
- b. A 'Profile' page can add or update details to their profile.
- c. A 'Change Password' can also change their passwords.
- d. A 'Forget Password' if they forget their login password, they can receive a link to change the password on their registered email-id.
- e. A 'My Subjects' page contains following features
Assigned Subjects: A list of all assigned subjects can be viewed grade-wise.
Students List: The teacher can view the list of the students in that Grade.
- m. A 'Attendance' page contains they can select grade and subject to view attendance. Biometric Attendance: They can take the biometric attendance of students. See the Attendance list of all Students grade-wise against 2 dates, lecture-wise.
- n. A 'Academics' page contains teachers can choose the grade, subject and student for their academic reports. They can view, add and update students' academic details. Teachers can add marks on tests, assignments and final exams. They can update existing marks on tests, assignments and final exams.
- o. A 'Complaint' page contains teachers can add new student complaint. They can view list of all the complaints and replies from admin.

See also for authentic understanding, click the link

<https://www.iitms.co.in/products/student-information-system-sis>; <https://samvidha.iare.ac.in>;

<https://theforest.net/item/clever-course-learning-management-system-theme/8645312>;

<https://markerspro.in> and so on. Each student has to refer any one of the web sites stated above.

9. PHARM EASY APPLICATION

Build a pharm easy application for ordering medicines and tests. This application comprises of following functionalities

1. A "Home Page" which consists of a list medicines & health care product.
2. A "Lab Tests page" contains different medical tests.
3. A "Health Care Products page" contains vitamins and necessary to our body.
4. A "Offers Page" offers on different products and coupons.
5. A "Account Page" contains details of individual customer.
6. A "Products Page" contains a list of products.
7. A "Detailed View of Product" detailed view of selected product.
8. A "Cart page" list of items we selected to buy.
9. A "Delivery Details Page" consists of customer address and contact details.
10. A "Payment Page" how to make payments (cod or online payments).
11. A "Success page" show transaction success.
12. A "Bottom APP Bar" consists of logos which opens the corresponding pages(fragments).
 - a. Home page
 - b. Test Page
 - c. Health Care Page
 - d. Offers Page
 - e. Account Page

See also for authentic understanding, click the link <https://pharmeasy.in>; <https://www.netmeds.com>; <https://www.medlife.com>; <https://www.practo.com> and so on. Each student has to refer any one of the web sites stated above.

10. NEWS APPLICATION

Build a news application is to connect news articles from all around the world and deliver it to user as fast as possible in best visualize way. This application comprises of following functionalities:

1. A 'User Interface' page should be able to select from different categories, countries and newspaper. Short News as list view with header, little description and image before showing full article can be helpful to user to determine what type of news they are looking for. View Holder can be used for this list view for better and fast experience.
2. A 'Admin Panel' page controls the User and Writers logins from database. Writers can add news, update and delete from its database as per required. Main Admin can add Users, Writers, and News. He can also approve, update and delete it. Using this approach, we can create network in local areas connect by writers and local admins which will provide news at local level and we can also implement location feature which will update local news of different location or city.
3. A 'Global Support' page contains different type of newspaper will be available from all around the world in different languages with this user will be able to get news from all around the world.
4. A 'Short News' page News will be displayed in short format with title, image and little description in list view. It will help user to access required news faster.
5. A 'Search Option' page which user will be able to search from not only one source but many different sources available within API.
6. A 'Favorites / Offline Reading' page which News can be added as favorites which will automatically will be saved for offline reading.
7. A 'Sharing' page which user will be able to share news easily on social media.

See also for authentic understanding, click the link <https://indianexpress.com>; <https://www.bbc.com/news>; <https://www.ndtv.com>; <https://www.hindustantimes.com> and so on. Each student has to refer any one of the web sites stated above.

11. AIR TRANSIT TRIP PLANNER APP

Build the air transit trip planner which This passenger on transit will spend their time at the airport while waiting for the next flight without any planning to visit tourism places nearby due to short period of time and much information needed to plan a short trip. This is such a waste because they actually can boost countries' economy in the tourism sector if they spend their time to visit some tourism places nearby the airport. Because of that, Air Transit Trip Planner aims to help these passengers on transit by planning a short trip to the nearby tourism places within the transition hour they have.

Air Transit Trip Planner also using Google Map API as a map to guide user and Google Places API as a data center to grab all the tourism places and its details. The output of this calculation is a suggestion of short trip planner for the user (passenger on transit). The trip planner will list down the tourism places user can visit within their flight transition hour, the distance to go there and also time taken to go there. Indirectly, this Air Transit Trip Planner application also helps to boost economy in the tourism sector of a country.

This application comprises of following functionalities:

1. A 'Main Page' which the user will see when they launch the application. In the background when this interface prompts, the system actually will automatically detect user current location by using GPS or Google Places. If no internet access or GPS is turn off, the system will prompt a pop up asking the user to turn on GPS or connect to internet. But if everything is fine, user just need to key in their transit hour and departure time then click enter.
2. A 'Tourism places' page will calculate how many tourisms places the user can visit within the transit hour they have by using the algorithm.
3. A 'place details" page will direct to new user interface with scrollable list view.
4. A 'pop up' page when user click each mark on map. When the user clicks the mark, the pop up will show the address of each location.
5. A 'GPS Navigation' page is using satellite and it is implementing context awareness concept where it will direct user to their destination. This interface also has voice navigation which will help the user to hear the navigation while driving rather than looking at the map continuously.

See also for authentic understanding, click the link <https://travelplanner.co.in>; <https://www.expedia.com>; <https://www.orbitz.com>; <https://www.kayak.com> and so on. Each student has to refer any one of the web sites stated above.

12. STUDENT-FACULTY DOCUMENT SHARING SYSTEM

Develop Student-Faculty Document Sharing System. This application is an online portal between students and faculty. This innovative system allows college faculty to share important data as well as notifications with engineering students. It consists of a faculty login along with student login. Since college faculty operate through pc and document uploading is simpler through a pc, the faculty login is to be performed through a computer. Faculty may upload documents of subject syllabus, timetable document, notifications, notes etc through their provided login. The documents are uploaded by faculty to different corresponding departments. We propose to build this system on an online server that allows faculty to upload data and students may view search and download required documents through their android device. Here students only see and download data of their particular semester. Faculty may access and upload/edit documents to any semester or add any notice as desired.

This application comprises of following functionalities:

1. A 'User login' page allows only the registered users to login in order to use this location tracking application.

2. A 'Document details' page stores documents in word and pdf format and also allows students to view particular data.
3. A 'Server management' page which displays the server smartly handles data and allows students with an android device to access data as well as faculty to upload document details.
4. A 'Faculty Upload' page allows faculty to upload documents to server.
5. A 'Student Download' page allows student to download only allowed semester data through his android phone using an active internet connection

See also for authentic understanding, click the link <https://akanksha.iare.ac.in>; <https://moodle.org>; <https://classroom.google.com>; <https://nevonprojects.com/student-faculty-document-sharing-android-project> and so on. Each student has to refer any one of the web sites stated above.

13. ONLINE RECRUITMENT SYSTEM

Build online recruitment system with the following functionalities:

1. A 'Administrator' page stores the information of the user's login and the password data. This provides security to the system and keeps the record of which user entered in the system at what instance of time. It has the following attributes:
 - a. Username: It stores the name of the admin which acts as the unique name given to the manager of the firm.
 - b. Password: This attribute holds the secured keyword given to every manager of the educational institutions who need access to the system
 - c. Login-Time: The login time of the admin will be recorded in this field which helps in tracking the admin performance.
 - d. Logout-Time: It stores the logout time of the admin from the system
2. A 'Job Seeker' page stores the information of the candidate who registers to the system for participation in the recruitment process, the Job Seeker entity is created. It will have all the required data about the applicant. It has following attributes
 - a. Can-Id: Candidate Id is a unique number given to each candidate who registers in the system
 - b. Can-Name: Candidate Name is the information required for details of the applicant who registers in the system.
 - c. Resume/CV: In this attribute job, seekers can store their resumes which can be reviewed by the organization if they want to further check the candidate
 - d. Projects: Every candidate has many projects which they have created or worked on, which they want to share with them, recruiters.
 - e. Personal-Info: This attribute holds all the information the recruiters needed from the candidate apart from its technical skills and eligibility.
 - f. Contact: This stores the contact information of the candidate like phone number and email id
3. A 'Skill' page is an essential part of the system as it works on both from recruiter and job seeker. It has the following attributes
 - a. Skill-Id: As every set of skills is unique so every set is given a unique number that acts as its id in the system.
 - b. Technical: It will store the technical skill by the applicant.
 - c. Academic-details: It will store the detailed information of the student in an academic field like high school marks, senior secondary marks. It will also have the graduation percentage is necessary for the skill.
 - d. Cocurricular-activities: Every skill does not only require the technical talent of the student it also needs other social skills.

4. A 'Requisition' page every employer will make the requisition of the application for the given post. From the application received from the number of the job seekers, the company will check their eligibility and decide whether he/she is compatible for the post or not. Then the shortlisted student will go for further rounds of the recruitment process as per the employer. It has following attributes
 - a. Req-Id: Every requisition present in the system given by each employer has unique numbers assigned to it.
 - b. Emp-Id: This attribute will hold the information of the employer who is giving this requisition.
 - c. Post: Every requisition given by the employer belongs to a specific post
 - d. Skill-Id: It is a reference to a skilled entity that implies the required skill set for the specific post.
 - e. Package: This attribute stores the information regarding the pay scale or salary
 - f. Criteria: In the criteria attribute, data regarding the process of recruitment is stored.
5. A 'Employer' page will store the detailed information of the employer present or registered in the system. Thus, making it one of the essential entities in the system. Before applying for any post, the applicant also wants to know about the company or the employer who has given the requisition. It has the following attributes
 - a. Emp-Id: It is the unique number given to the employer to differentiate from others.
 - b. Emp-Name: It will hold the name of the employer which is registered in the system.
 - c. Information: This entity will hold the information of the employer like when it is founded, what kind of projects they are working on
 - d. Key-Persons: It holds the data of the important persons of the company and the point of the contact for the interested candidates.
6. A 'Interview' page has information about the interviews that will happen for the specific requisition. As the interview is an important part of any recruitment process as in this the employer and candidates come face to face and they can judge each other. It has following attributes
 - a. Int-id: It is the unique number given to each interview process that happens in the system
 - b. Int-type-id: As there are many kinds of interviews that can happen during the recruitment process.
 - c. Req-Id: It will hold the reference of the requisition for which a specific employer is conducting this interview.
 - d. Remarks: This has the remarks of the interviews which is given by the employers.
 - e. Emp-Id: It holds the data of the employer who is conducting this interview and managing the whole process.
7. A 'Interview-Type' as there is various type of interview process which happens in the recruitment like technical for checking the technical knowledge of the candidate or the HR interview to test the social and interpersonal skill of the applicant. It has following attributes
 - a. Int-type-id: It is the unique number given to each type of interview
 - b. Int-type-Name: It holds the name of the type of interview.
8. A 'Offer-Letter' when candidates apply for the job and it takes every criterion provided for a specific post. If it qualifies for the post the company will provide him/her with the offer letter. It is a document that makes the offer to the candidate for joining the employer's firm. It has detailed information regarding the package and the work environment of the company. It has following attributes
 - a. Of-id: Each offer letter is given a unique and distinct number
 - b. Emp-Id: It is the number given to the employer as it gives the information about which company has given this letter.
9. A 'Experience' to show the talent each applicant writes the experience they have gain in the previous years. It helps the employer to see which applicant has the relevant knowledge

required for the post. So, they can hire a person who has more potential than others. It has following attributes

- a. Exp-Details: It holds the information candidate has learned during the work.
 - b. Exp-Organization: The name of the organization in which the applicant has gained the experience.
10. A 'Feedback' page is holds the feedback of the job seekers about their recruitment process for an employer or a requisition. It has the following attributes:
- a. Feed-Id: It is a unique number given to each feedback. It makes the remark distinct and identifiable for the employers to take note of.
 - b. Emp-id: It is a reference to the employer for which this feedback is given
 - c. Feed-details: It holds the remark given by the applicant

See also for authentic understanding, click the link <https://www.tracker-rms.com>; <https://www.bullhorn.com/glossary/online-recruitment-system>; <https://www.manatal.com>; <https://www.whatishumanresource.com> and so on. Each student has to refer any one of the web sites stated above.

14. STUDENT COUNSELING MANAGEMENT SYSTEM

Build Student Counseling Management System with the following functionalities

1. A 'Student' page will store the record of the student registered for the counseling. It is essential for the system as a separate unit which has all the information regarding the student and their personal and professional data. So, it will have the 10th and 12th percentage, rank in the entrance exam will also be asked from student to give the preferences according to it. It has the following attributes:
 - a. Name: This will store the name of the student as it needed while saving the required
 - b. DOB: The date of birth of the student as mention in the high school certificate and will act as the candidate key in the database model
 - c. Student-id: It is a unique alphanumeric number assigned to every student who registers for the counseling
 - d. Password: It is an alphanumeric field that has the constraint of having a minimum of 8 digits and at least one alphabet with numbers
 - e. 10th Percentage: This is used to get the student's percentage in high school which some universities check before giving admission to the student.
 - f. 12th Percentage: It is an academic field that requires the student to give information about the 12th standard.
 - g. Rank-Entrance-Exam: This attribute gets the entrance exam rank from the student which they have got according to their performance in the exam
2. A 'Choices' page is needed to get the preferences from the student based on their rank in the entrance exam. The number of choices given to the student can be multiple based on the institution that requires the seats available for the courses. These preferences will go to the courses entity which then checks which selection is eligible for the student, this evaluation will be based on the number of seats available and the rank of the student. This is also will be referenced in the allotment of the seats where the allotted seats are recorded. It has the following attribute:
 - a. Rank-Entrance-Exam: This attribute gets the entrance exam rank from the student which they have got according to their performance in the exam.
 - b. 1st Preference: This will be a simple attribute that holds the first preference of the student which he/she will select from the pool of choices.
 - c. 2nd Preference: It will hold the second preference of the student as it is not always possible to get the first selected choice as it may have got filled or the student with a higher rank got that seat.

3. A 'Courses' page will have all the courses provided by the institutes. All the courses will have institute code will differentiate if the same courses are provided by the different institution. Every course has the define the seats available and the allotted seats along with the total seats available which will provide transparency in the system. It has the following attribute:
 - a. Course-code: A unique number given to every course not depends on which university to it belongs, it helps in maintaining the record unique and distinct so act as the primary key for the entity.
 - b. Institute-code: Every institute that has register itself for the system of counseling has given a unique code that differentiates it from other institutes which have the same courses.
 - c. Total-seats : It will have the total seats available for that course provided by the Institute.
 - d. No-of-seats: It is a composite attribute which has the further information about a number of seats allotted and the vacant seat left for the course.
4. A 'Course-Name' page will contain the name of the course and the unique id of that course. As the many institutes provide the same course it would be a difficult job to assign a different code to the same course. So, this field will be normalized. It has the following attribute:
 - a. Course-code: A unique number is given to every unique course.
 - b. Course-name: The name of the course will be stored in this attribute.
5. A 'Allotment of Seat' page will store the information of the student after the seat is confirmed for allotment. It has the following attribute:
 - a. Student-id: Student unique id number.
 - b. Rank-Entrance-exam: Rank gave to the student as per his/her performance in the entrance exam
 - c. Preference-no.: The preference which got allotted, as per the choices are given to him.
 - d. Course-code: The course code which got selected for.
 - e. Institute-code: The institute allotted the seat.
6. A 'Institutes' page will store the information regarding the institutes which are participating in the counseling. Each one of them has to publish their courses for which they want students with the number of the total seats. It has the following attributes:
 - a. Institute-code: Every institute that has register itself for the system of counseling has given a unique code that differentiates it from other institutes which have the same courses.
 - b. Institute-name: It will hold the name of the institute as mention by them in the registration process.
 - c. City: It depicts the city to which the institute belongs to as it helps as a candidate key.
 - d. Password : It is an alphanumeric field that has the constraint of having a minimum of 8 digits and at least one alphabet with numbers.
7. A 'Admitted-Student' page maintains their own record of which student has admitted to their institute and the courses what courses they have opted for. It has the following attributes:
 - a. Student-id: Student unique id number.
 - b. Course-code : The course code which got selected for.
 - c. Institute-code: The Institute for which the seat is allotted. Institute is related to this entity as every university will have a database of how many students have been admitted to its courses.

See also for authentic understanding, click the link <https://www.academiaerp.com>; <https://collegedunia.com/exams/cuet/counselling>; <https://nchmcounselling.nic.in>; https://www.cdac.in/index.aspx?id=edu_acts_Login_cv11 and so on. Each student has to refer any one of the web sites stated above.

15. DATA MART MANAGEMENT SYSTEM

Build a Data Mart Management system with the following functionalities

1. A 'Master Maintenance' page maintains the following master details for various purposes. It has the following attributes
 - a. Suppliers Details
 - b. Sub location In-charges Details
 - c. Retailers Details
 - d. Products Details
2. A 'Shipment' page provides you a number of functions to maintain the flow of goods in warehouse. It has the following attributes
 - a. Transfer inventory
 - b. Put inventory on hold
 - c. View inventory balances
 - d. View inventory transactions
3. A 'Billing' page warehouse billing process allows the retailer to generate new bills and also allows viewing of existing bills.
4. A 'Reports' page reports process allows the user to produce the reports necessary for day to day warehouse operations. The standard reports are
 - a. Inventory Reports
 - b. Purchase Order Reports
 - c. Administrative Reports

See also for authentic understanding, click the link <http://www.datamartsys.com>; <https://netresultsgroup.com>; <https://www.indiamart.com>; <https://uniondatamart.com> and so on. Each student has to refer any one of the web sites stated above.

16. RESTAURANT RESERVATION AND TABLE MANAGEMENT SYSTEM

Build a Restaurant Reservation and Table Management system is a Web application designed to help you (and your coworkers) to select the restaurant you are going to eat in. You can manage users, restaurants, menus, prices, give notations to each lunch, etc.

1. A 'Reservation Management' page functionalities are
 - a. Easily enter or modify reservations while viewing guest histories.
 - b. Capture phone numbers, email and mailing addresses.
 - c. Allow management blocking and VIP pre-assignments.
 - d. Reduce no-shows with enhanced customer tracking.
 - e. Take reservations from your website or Open Table 24 hours.
2. A 'Table Management' page functionalities are
 - a. Maximize seat utilization with walk-in and waitlist functionality.
 - b. Instantly track covers for more efficient kitchen and server management. Increase table turns by tracking party status. Store multiple reservation sheets for holidays and special events.
 - c. Hold and combine tables for large parties.
 - d. Record and view shift notes for each day
3. A 'Guest Management' page functionalities are
 - a. Identify regulars and VIPs
 - b. Track customer preferences to meet and anticipate special requests
 - c. View customer reservation histories at-a-glance
 - d. Track special occasions such as guest birthdays and anniversaries Marketing Management
 - e. Conduct powerful email marketing campaigns to increase repeat business.
 - f. Print mailing labels to reach select target audiences.
 - g. Track and reward concierge business.

4. A 'Increase control' page functionalities are
 - a. Manage reservations from the back-office or any other location. Simultaneously control multiple restaurants from key centralized locations.
 - b. Share guest data across sister restaurants.

See also for authentic understanding, click the <https://www.elluminatiinc.com/restaurant-reservation-system>; <https://restaurant.opentable.com>; <https://www.tornosubitodubai.com>; <https://indiarestaurant.co.in> and so on. Each student has to refer any one of the web sites stated above.

17. SECURE STOCK EXCHANGE SYSTEM

Build a secure stock exchange system that is designed for the sale and purchase of securities of corporations and municipalities. A stock exchange sells and buys stocks, shares, and other such securities. In addition, the stock exchange sometimes buys and sells certificates representing commodities of trade.

The system "Secure Stock Exchange System using Web Services" consists of 3 modules

1. A 'Stock Markets and Investments' page functionalities are
 - a. Stock Exchange Listing
 - b. Stock Options & Analysis
 - c. Stock Market Crash
 - d. Selling Stock Certificates
 - e. Stock Market Forecasts
2. A 'Stock Options' page contains different types of Stocks
 - a. Stock Option Valuation
 - b. Restricted Stock Options
3. A 'Related Information' page functionalities are
 - a. Day Trading Stocks
 - b. Stock Quotes & Stock Ticker
 - c. Stock Charts
 - d. Share Portfolio Management

See also for authentic understanding, click the <https://stocksandsecurities.adityabirlacapital.com>; <https://www.nseindia.com>; <https://www.jpx.co.jp/english>; <https://www.mstock.com> and so on. Each student has to refer any one of the web sites stated above.

18. COUNTRY CARGO AND EXPRESS COURIERS SYSTEM

Build a project country cargo and express couriers system to deal with the queries of manger. How much more time it will take to reach the place, and whether received in original state. Queries among the officers regarding handling etc. User satisfaction guest book where user should put some notes about service and other suggestions. User complaint registers to help us get better feedback for our failures as a hospitable interface. Providing an interactive interface for the user query for online status of the packets booked and delivered.

Modules:

1. A 'LOGIN MASTER' page is the specific module, which only has to deal with the updating of the database. Two types of user can login administrator and the employee. It checks for a valid candidate when the user enters his user id password and link to the correct page and link to the registration page. It is divided into following functions.
 - a. USER ID CHECKER: As user id rules the system for updating (control panel). So his uniqueness and type of his user id know a person whether he is master or one of the employee. As it is to provide the viable candidate system, so the user id is being validated with password in different cases to validate the genuinely of the candidate.

- b. THE LOGIN STATUS MASTER: This module keeps the status of who and when logged in and for which purpose and for how much time.
2. A 'REGISTRATION MASTER' page as this module is only accessible through administrator password.

This modules deal with the different state of registration as-

 - a. Registration form display
 - b. Client's does validation being handles by validation master
 - c. Unique user id checker (checks that the user id being entered by the candidate is unique or no)
 - d. Auto user id generator (user id field by taking the email id of the user if it is unique or suggest by combining it will some number).
3. A 'COURIER STATUS NOTIFICATION MASTER' module handles the query of customer and displays the result according to that customer is asked to enter the booked id in the specified input area. On the basis of input the detail regarding where material exactly is shown.

This module contains the following sub modules-

 - a. QUERY HANDLER: This module handles to and from the courier and cargo differentiation master searches the data in the database, which through different conversion through numbers of tables shows the result regarding where exactly the cargo is?

The booking id is first searched into the courier booked table. Each booking id has a unique number associated with the different offices and also with the courier.

On the basis of that booking id, matched with the lot id, and then with the medium and after that medium halted at which station. These statuses are shown.
4. A 'DELIVERY STATUS NOTIFICATION' page module deals with the delivery status whether the following courier has been delivered to the destination or not, how much time it will take to reach the destination. It has following sub modules-
 - a. DISTANCE CALCULATOR: It takes the data from the route table that specifies distance between the current city (the city through which tile courier is passing and the destination).
 - b. TIME CALCULATOR: An average time is calculated on the basis of the average time taken to reach the two adjoining city subsequently to the destination.
 - c. DELEVERED STATUS: It checks the current status if the current status of the courier gives the destination address and after taking the received detail. It display whether the courier is on its way or delivered successfully.
5. A 'BOOKING DETAILS FOR CARGO' page for cargo booked, source office, destination office, container, truck detail, date dispatched etc regarding booking of new courier with a unique id. It includes the following sub modules-
 - a. CARGO STATUS : This specially deals with the updating at intermediate office about the truck number that passed through office.
 - b. LOADING UNLOADING DETAILE :This deals with the loading and unloading cargo from one truck to another truck or one container to another container and other entries to keep the site working.
6. A 'CUSTOMER QUERY HANDLER MASTER' module specially deals with the handling of query of the customer. This module has following sub modules –
 - a. CUSTOMER QUERY HANDLING : This module generates a input form through which customer can directly interact with tile intermediate office where there courier & cargo is! Through different function and tables.

- b. CUSTOMER COMPLAINT REGISTER : Customer can directly enter the complaint regarding end office, and the response is sending through the head office. This complaint is only viewable through administrator account.
7. A 'CARGO STATUS NOTIFICATION MARKER' page modules handles the query of customer and display the result according to that customer is asked to enter the booked id in the specified input area. On the basis of input the detail regarding where there material exactly is shown. This modules contains the following sub modules-
- a. QUERY HANDLER : This modules handles the query of the customer searches the data in the database, through number of tables shows the result regarding where exactly the cargo is? The booking id is first searched in to the cargo booked table. Each booking id has unique number associated with the different offices and also with the cargo. On the basis that booking id, matched with the container, and then with the truck, and after that true halted at which station. The status is shown.
8. A 'DELIVERY STATUS NOTIFICATION SYSTEM FOR CARGO' system deals with the delivery status whether the following cargo has been delivered to the destination or not or how much time it will take to reach the destination. It has following sub modules-
- a. DISTANCE CALCULATOR: It takes the data from the route table that specifies distance between the places then calculates the distance between the current cargo (the city through which the cargo is passing and the destination).
 - b. TIME CALCULATOR: An average time is calculated on the basis of the average time taken to reach the two adjoining city subsequently to the destination average truck halt time and a time in day returned.
 - c. DELEVERED STATUS: It checks the current status if the current status of the cargo gives the destination address and after taking the received detail. it display whether the cargo is delivered successfully or not.

See also for authentic understanding, click the <https://worldwideexpresscouriers.com>; <https://www.vxpress.in>; <https://www.tciexpress.in>; <https://www.bluedart.com> and so on. Each student has to refer any one of the web sites stated above.

V. TEXT BOOKS:

1. Reto Meier, *Professional Android 4 Application Development*, Wile Publication, 1st Edition, 2012.

VI. REFERENCE BOOKS:

1. Bill Phillips and Chris Stewart, Kristin Marsicano *Android Programming*, The Big Nerd Ranch Guide, O'Reilly, 3rd Edition, 2017.
2. Dawn Griffiths, David Griffiths, *Head First Android Development: A Learner's Guide to Building Android Apps with Kotlin, Third Edition*, O'Reilly, 3rd Edition, 2021.
3. Antonio Leiva, *Kotlin for Android Developers: Learn Kotlin while developing an Android App*, CreateSpace Independent Publishing, 1st Edition, 2016.

VII. WEB REFERENCES:

1. <https://www.javatpoint.com/android-tutorial>
2. <https://www.tutorialspoint.com/android/index.htm>
3. <https://docs.flutter.dev/>
4. <https://developer.android.com/courses/android-basics-compose/course>
5. <https://developer.android.com/guide>

VIII. MATERIALS ONLINE

1. Course Template
2. Lab Manual