Software Engineering Lab: 3220404

Course outcomes focused on employability/entrepreneurship and skill development

S No.	Course Outcome (CO)	Mapping
1	**Design** the software using modern tools and techniques	Skill Development
2	**Develop** and test the software through different approaches	Skill Development
3	**Prepare** technical report on experiments conducted in the lab	Skill Development

LIST OF EXPERIMENT

1: Identify the requirements from problem statements
Requirements, Characteristics of Requirements, Categorization of Requirements, Functional Requirements, Identifying Functional Requirements

2: Estimation of project metrics using estimation techniques like COCOMO model
Project Estimation Techniques, COCOMO, Basic COCOMO Model, Intermediate COCOMO Model, Complete COCOMO Model, Advantages of COCOMO, Drawbacks of COCOMO, Halstead's Complexity Metrics

3: Modeling UML Use Case diagrams and capturing Use Case Scenarios Use case diagrams, Actor, Use Case, Subject, Graphical Representation, Association between Actors and Use Cases, Use Case Relationships, Include Relationship, Extend Relationship, Generalization Relationship, Identifying Actors, Identifying Use cases, Guidelines for drawing Use Case diagrams

4: E-R modeling from the problem statements
Entity Relationship Model, Entity Set and Relationship Set, Attributes of Entity, Keys, Weak Entity , Entity Generalization and Specialization , Mapping Cardinalities , ER Diagram, Graphical Notations for ER Diagram , Importance of ER modeling

5: Modeling UML Class diagrams and Sequence diagrams
Structural and Behavioral aspects, Class diagram, Elements in class diagram, Class, Relationships, Sequence diagram, Elements in sequence diagram, Object, Life-line bar, Messages

6: Modeling Data Flow diagrams
Data Flow Diagram, Graphical notations for Data Flow Diagram, Explanation of Symbols used in DFD, Context diagram and leveling DFD

7: Create flow chart for an algorithm using Raptor Assignment, Call, Input, Output, Selection and Loop symbols.

8: Estimation of Test coverage metrics and structural complexity
Control Flow Graph, Terminologies, McCabe's Cyclamate Complexity, Computing Cyclamate Complexity, Optimum Value of Cyclamate Complexity, Merits, Demerits.

9: Designing Test Suites
Software Testing, Standards for Software Test Documentation , Testing Frameworks ,Need for Software Testing ,Test Cases and Test Suite , Types of Software Testing , Unit Testing , Integration Testing , System Testing , Example , Some Remarks.

10: Statechart and Activity Modeling
Statechart Diagrams, Building Blocks of a Statechart Diagram, State, Transition, Action, Guidelines for drawing Statechart Diagram, Activity Diagrams, Components of an Activity Diagram, Activity, Flow, Decision, Merge, Fork, Join, Note, Partition, A Simple Example Guidelines for drawing an Activity diagram.

Microprocessor & Embedded Systems :3200403

(SKILL BASED MINI PROJECT LIST)

1. Design and develop a robot to collect physical components
2. Design and develop a line follower robot
3. Design and develop a race car which is controlled using different wireless protocols
4. Design and develop a smart safety helmet for driver health monitoring
5. Design and develop an early accident detection system for the vehicles
6. Design and develop smart safety gadgets for physically/mentally disables person.
7. Design and develop smart pet feeder system
8. Design and develop an attendance system using facial recognition
9. Design and develop smart scanner machine for library books
10. Design and develop smart solutions for critical health infrastructures
11. Design and develop a smart solution to manage the data entries for grocery shop
12. Design and develop an example of Industry 4.0

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LIST OF SKILL BASED MINI PROJECT

Note: In every project students must have to

- Design the SRS of the project.
- Draw the various ER diagram, DFD and Use Case diagram of the project.
- Design the test case of the project.

Mini Skill Project 01

Delivery Agent System

There are many online shopping portals such as Flipkart, Amazon, Snapdeal, etc. are active in the Indian market. One major task is to deliver an online books T-shirt to the customers as first as possible in a cost-effective (cheapest) manner. A delivery agent system, which would automatically receive a delivery request from an online portal and identify the couriers, whom the delivery job can be assigned.

Input:

- Shipping details (source and destination) locations
- Couriers' details in different localities.
- Service offering for each courier company

- **Functions:**

- Booking delivery
- Status of delivery
- Cancellation of booking

Output:

- Booking confirmation, if booking is successful.
- Reporting delivery status
- Cancellation of booking confirmation

Mini Skill Project 02

Payroll Management System (PMS)

The Employee and Payroll Systems objective is to provide a system which manages the employee details, the Payroll activity done in a company depending upon the employees'attendance and its calculation which is very huge. The users will consume less amount of time through computerized system rather than working manually. The system will take care of all the payroll activities like managing each employee's attendance, the number of leaves taken by that particular employee and calculation in a very quick manner and it avoids Data storing is easier. Paper work will be reduced and the company staffs spend more time on monitoring the progress. The system is user friendly and easy to use. All the important data's will be stored in the database and it avoids any miscalculation. The "Employee and Payroll System "is based on maintaining each employee records and calculating his/her salary depending on the workdays. The first activity is based on saving the employees details where each employee will be given a unique Employee ID. Now based on the no of days an

employee attended per month, salary will be calculated by checking the no of workdays of a company and his/her basic salary and a separate salary slip will be provided for reference.

Inputs:

- Employee details (employee no, name, address, designation, department, achievements) Accounts details (salary of each employee, deduction, TA, DA, HRA, other allowance, PF)
- Leave information (no of leave taken by each employee)

Output:

- Salary slip
- Detailed salary report
- Deduction details
- Leave information

Mini Skill Project 3

Online Toll Plaza System

Now-a-days, cashless transaction is becoming popular among the users because it is easy to handle, and it does not require carrying cash in hand. Typically, in India, road tolls are collected from cars manually for which the cars need to stop to pay the toll fee. In contrast, the objective is to make the system Online, so that the toll fee is automatically deducted from the user. Therefore, users credit their Online account (consider this as eWallet), and money is automatically deducted when the cars pass the toll system. As a result, the users do not have to wait for manual toll fee payment. Concurrently, administrator can also view all transactions from anywhere. Finally, the administrator can view the total income in a day-to-day basis, and can also analyze the traffic pattern as well.

Inputs:

- User Information (Name, Car Number, Email Address, Password, Money in eWallet)
- Administrator Information (Email Address, Password)

Operations:

- User
  - Log-In
  - Credit in eWallet
  - Check eWallet Balance
  - Log-Out
- **System**
  - Check the car number
  - Required Fee Available
  - Allow the car to pass
  - Deduct money from eWallet
  - Required Fee NOT Available
  - Do Not Allow the car to pass
  - Fee Payment is done manually
  - Allow the car to pass
  - Total Income is stored in a database
- **Administrator**
  - Log-In
  - View transactions
  - View total income

Outputs:

- Display day-wise transactions to administrator
- User can view his/her own transactions

Mini Skill Project 04

Online Examination System

Now-a-days, online examination system has become popular for competitive examinations because of its unique features such as auto-evaluation, speed and accuracy. Moreover, it also helps environments by reducing the use of paper. In such a system, students are asked to select answers from multiple options given for a single question. Likewise, there are several questions which appear in the students' systems. The questions and multiple options are saved in a database along with desired answers. Typically, a student can edit an answer after saving it, however, editing cannot be done after submitting the answer. Another user is also there —administrator. The administrator can create, modify and delete questions and accordingly, the question is updated in the system.

Inputs:

- Subject Information with Code, so that all subjects can be identified using unique codes.
- User Information
- If Student- Student Information (Name, Roll No, Email Address, Contact Number, Password)
- If Administrator (Email Address, Password)
- Set of Questions with multiple answers for each stored in a database along with desired answers.

Operations:

- Administrator
  - Log-In
  - CREATE, MODIFY or DELETE questions. Accordingly, the question set must be updated.
  - Log-Out
- **Student**
  - Log-In (Time starts)
  - Answer the questions — SAVE and SUBMIT
  - Log-Out (Automatically logged out after Timeout)

Outputs:

- Display the result in DESCENDING order according to obtained marks with Roll Number.
- The result is also saved into a database for future use.

Mini Skill Project 05

Fingerprint based ATM System

Fingerprint Based ATM is an application where fingerprint of the user is used to withdraw and transfer many from ATM. The finger print features are different for each human being so the user can be identified uniquely. Fingerprint based ATM is safer and secure. By using this system we are safe from losing ATM card and no need to carry it. User has to use the fingerprint for doing banking transaction from ATM. The user has to login using his fingerprint and he has to enter the pin code in order to do further transaction. The user can withdraw money from his account. User can transfer money to various accounts by mentioning account number. To withdraw money user has to enter the amount he want to withdraw. User can also view the balance available in his respective account.

Input:

Login: User can login to the system using his fingerprint.

Add Pin Code: User has to scan finger and add pin code for doing transactions.

Output:

Withdrawal of cash: User can withdraw cash by entering the amount.

Transfer of Money: User can transfer cash to other accounts by entering the account number.

View Balance: User can also view balance in his account.

View Transaction: User can view last ten transactions.

Mini Skill Project 06

Finger Print Based Voting System (FVS)

FVS system is an application where the user is recognized by his finger pattern. Since the finger pattern of each human being is different so the system allows the voter to vote through his fingerprint. Finger print is used to uniquely identify the user. Voter can vote the candidate only once, the system will not allow the candidate to vote for the second time. The system will allow admin to add the candidate name and candidate photo who are nominated for the election. Admin will register the voters name by verifying voter. Admin will authenticate the user by verifying the user's identity proof and then admin will register the voter. The number of candidate added to the system by the admin will be automatically deleted after the completion of the election. Admin has to add the date when the election going to end. Once the user has got the user id and password from the admin the user can login and vote for the candidate who are nominated. The system will allow the user to vote for only one candidate. The system will allow the user to vote for one time for a particular election. Admin can view the election result by using the election id. Even user can also view the election result.

Input:

Placing of finger for identification

Casting of vote

Output:

Display after the vote casting

Results viewed by the Admin

Mini Skill Project 07

Android Patient Tracker

Android patient tracker is an application to aid in dispensary patient data management and viewing it. The system is developed to help doctors to enter as well as view patient history and patient details. This application can be installed on doctor android phone to be used for further login. This system allows the doctor to open application and enter the details of any patient that is taking treatment under his observation. The application allows doctor to insert Patient data such as patient name, disease, medication provided, treatment history, cost etc. The doctor can view this data when needed. The application allows doctor to search patients by name as well as date.

Modules

1. Doctor Module: Doctors can register and can make their account here. They can access the patient detail after making account into this module. Also doctors can post any status or update to inform the patients.
2. Patient Module: Accounts of the patient are made up in this module and patients can add his status and other queries into this module.
3. Data Module: This module can only be access by the doctors. All the data which the patient cannot be enter into the system by themselvescan be entered into this module by doctors.
4. Admin Module: All the data and information which is uploading for the easy access by the doctors is done via the administration.

Technologies used in the android patient tracker using smartphone device project

- Java
- Android
- Basic4Android
- SQL
- Kivy
- Ms SQL Server

Software Requirements

- Andorid software development kit (SDK)
- Windows XP
- Java Development Kit (JDK)
- Notepad
- Android debug bridge

Hardware Requirements

- Hard Disk – 2 GB.
- RAM – 1 GB.
- Processor – Dual Core or Above.
- Mouse.
- Keyboard.
- Monitor.
- Printer.

Mini Skill Project 08

Smart Security System for Women safety

Today in the current global scenario, the prime question in every girl's mind, considering the ever rising increase of issues on women harassment in recent past is mostly about her safety and security. The software or application has access to GPS and Messaging services which is pre-programmed in such a way that whenever it receives emergency signal, it can send help request along with the location co-ordinates to the parents.

Software Algorithm

1. Assign the transmitter and receiver pins of GPS module.
2. Set the serial buffer with baud rate 9600 and bit rate 4800.
3. Now set a loop which will then trigger the following actions:

a) Scan the contact number from SIM.
b) Get data from GPS module.
c) Convert the longitude and latitude obtained from GPS into a Goggle URL.
d) Attach this URL with an alert message.
e) Send this message to pre-selected mobile numbers from SIM memory periodically until device is reset

Mini Skill Project 09

Smart health prediction system

The age of digital technology requires the world to provide the best possible health care system to ensure that citizens and communities are alive and well. Users can use this cloud-based web application anytime they feel uncomfortable in their lives and try to ignore it. They can visit the app and provide details of their problem and other information related to their bodies such as weight and height and based on that our app will provide accurate information related to their health.

1. Patient Registration
2. Patient Login
3. Viewing Diseases/Symptoms Details
4. Selection of Disease Selection
5. Diseases Prediction Based on the patient diseases, symptoms and personal details like height and weights, decisions will be made.
6. Results Reports will be generated based on all analysis made previously and then BMI and Report will be shown on the final stage of application.

Mini Skill Project 10

E-commerce Website

This project deals with developing a Virtual website **'E-commerce Website'**. It provides the user with a list of the various products available for purchase in the store. For the convenience of online shopping, a shopping cart is provided to the user. After the

selection of the goods, it is sent for the order confirmation process. The system is implemented using Python's web framework Django.

Customer Interface:

1. Customer shops for a product
2. Customer changes quantity
3. The customer adds an item to the cart
4. Customer views cart
5. Customer checks out
6. Customer sends order