**Academic Year:** 2023-24 Even Semester

**Class (Branch):** SY B. Tech CSE

**Title of the Course:** Mini Project-1

**Course No.:** UCSC0408

**Course Description, Details of Exercises, Evaluation Scheme and Rubrics for the Course Level/ Multi Course Project Based Learning (PBL)**

**COURSE DESCRIPTION:**

In this mini project, the students will apply Project Based Learning to a multi-course environment for solving different real world problems. The students shall use the concepts they have learned in their S.Y. B. Tech Program (SEM-III) & the courses they are learning in the current semester i.e. SEM-IV. Students will develop a solution to an identified problem.

**Course Pre-Requisite:**

Students shall have the basic knowledge of:

1. Understanding project scope, objectives, and constraints.
2. Proficiency in relevant technical tools and methodologies.
3. Effective communication and collaboration within project teams

**Course Learning Objectives:**

1. To impart practical knowledge and hands-on experience in applying theoretical concepts to real-world engineering problems, enhancing students' understanding of engineering principles.
2. To develop critical thinking, problem-solving, and project management skills through the execution of mini projects, fostering creativity and innovation in engineering solutions. To impart ………………………………..

**Course Outcomes:**

|  |  |  |
| --- | --- | --- |
| **COs** | **After the completion of the course the students will be able to** | **Bloom’s Taxonomy** |
| **Descriptor** |
| CO.1 | Identify real world problems which can be solved using CS concepts and technologies. | Analyze |
| CO.2 | Describe the the proposed solution to the real world problem using technical report. | Understand |
| CO.3 | Implement the proposed solution using Computer Science & Engineering techniques | Apply |
| CO.4 | Build detailed project report. | Create |

**CO-PO Mapping:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | 2 | 1 |  |  |  | 1 |  | 1 | 3 | 2 | 2 | 3 | 3 | 3 |
| **CO2** | 2 | 2 | 3 |  | 3 | 1 |  | 2 | 3 | 2 | 2 | 3 | 3 | 3 |

**Course Assessment Scheme:**

|  |  |
| --- | --- |
| **Assessment** | **Weightage (Marks)** |
| ISE1 | 50% |
| ISE2 | 50% |

**ISE:** Based on Project Based Learning/ Mini-Project assigned/ Presentation/ Group Discussion/ Internal oral etc.

**TECHNICAL DETAILS**

**Project Title: Real Time Parking Space Recommendation.**

**Project summary** **:**

A real-time parking space recommendation app is a revolutionary solution aimed at streamlining the process of finding parking in urban areas, transforming it into a user-friendly experience. It goes beyond mere convenience, integrating technology into city infrastructure and vehicles to create interconnected systems that function seamlessly. By guiding cars, motorcycles, and other vehicles to available parking spaces with precision, the app eliminates the frustration of circling and contributes to a reduction in carbon emissions, thus playing a pivotal role in promoting sustainable living.

Developed using Java and integrated with Navigation Maps, this app represents a significant leap forward in modernizing urban mobility. Its primary function is to provide real-time guidance to available parking spaces, not only simplifying parking but also supporting sustainable practices by minimizing unnecessary driving and carbon emissions.

The app operates by collecting real-time data on parking availability, processing it, and then relaying it to drivers swiftly and efficiently. By automating parking space management, it enables drivers to locate vacant spots promptly while assisting parking operators in effectively managing their space inventory. Drawing data from diverse sources, including user inputs and Google Maps, it ensures the provision of up-to-date parking information.

In conclusion, the development of a real-time parking space recommendation app marks a significant advancement in urban mobility, aligning with the vision of Smart Cities. Beyond enhancing convenience, it serves as a catalyst for sustainable urban living by simplifying parking processes and reducing environmental impact.

**Key words:**

**Introduction (under the following heads):**

**a) Origin of the proposal:**

- Inspiration from the increasing challenges faced in urban parking management.

- Recognition of the need for innovative solutions to optimize parking space utilization.

- Awareness of the potential benefits of real-time technology in addressing parking issues.

**b) Definition of the problem**:

- Limited availability of parking spaces in urban areas leading to congestion and inefficiency.

- Inadequate utilization of existing parking infrastructure due to lack of real-time information.

- Difficulty for drivers in finding suitable parking spots, resulting in carbon emission and wasted time.

**c) Objective:**

- To develop a real-time parking space recommendation system to address urban parking challenges.

- To provide drivers with accurate and timely information about available parking spaces.

- To optimize parking space utilization, reduce congestion, and enhance overall urban mobility.

**Review and status of Research and Development in the subject:**

**a) International Status**:

- Real-time parking space recommendation systems have gained significant attention internationally.

- Various countries have implemented or are researching such systems to address urban parking challenges.

- Notable advancements include smart parking solutions using IoT sensors, machine learning algorithms, and mobile applications.

**b) National Status:**

- In India there is a growing awareness of the need for smart parking solutions.

- Some cities have initiated pilot projects for real-time parking guidance systems.

- However, there's still a gap in widespread implementation and optimization of such systems at the national level.

**c) Importance of the Proposed Project in the Context of Current Status:**

- The proposed project holds significant importance in addressing the existing gaps in parking management.

- It aims to provide a tailored solution to specific parking challenges.

- By offering real-time recommendations, the project can contribute to reducing traffic congestion, pollution, and driver frustration.

**d) Review of Expertise Available with Proposed Investigating Group/Institution**:

- The investigating group/institution possesses expertise in areas such as data analytics, machine learning, and urban planning.

- They have prior experience in developing and implementing technology-driven solutions for urban challenges.

- The team comprises members with diverse skill sets necessary for the successful execution of the project.

**e) References:**

A Review of Current Technologies and Future Directions' by Smith et al., 'Urban Parking Management: Challenges and Solutions' by Johnson and Garcia.

**Work plan:**

**a) Methodology:**

- Develop algorithms for real-time parking space recommendation based on data analysis and machine learning.

- Implement a prototype system integrating sensors, databases, and mobile applications for testing and validation.

**b) Organization of Work Elements:**

- Data collection and analysis

- Algorithm development

- Prototype system design and development

- Testing and validation

- Documentation and reporting

**c) Time Schedule of Activities with Milestones:**

- Month 1: Data collection and analysis

- Month 2: Algorithm development

- Month 2: Prototype system design and development

- Month 3: Testing and validation

- Month 3: Documentation and reporting

**d) Suggested Plan of Action for Utilization of Research Outcome:**

- Collaborate with local authorities and parking management companies for potential implementation.

- Publish research findings in academic journals and present at conferences.

- Provide recommendations for policy improvements and urban planning strategies based on project outcomes.

**Novelty/ Newness in the Work:**

The novelty of a real-time parking space recommendation app with programmes, algorithms and navigations lies in its unique approach to solving a common urban problem without relying on AI or sensors.

**1.Integration with navigations:** The app leverages the power of maps to provide real-time data on parking availability. This integration allows users to not only find available parking spaces but also get directions to them.

**2.User-Friendly Interface:** The app is designed with a user-friendly interface that makes it easy for users to navigate and find information quickly

**3.Real-Time Updates:** The app provides real-time updates on parking availability, ensuring that users always have the most current information.

**4.Diverse Functionality:** The app offers diverse functionality, including real-time parking availability, reservation-based parking, payment and mobile wallet integration, and navigation and routing.

**5.Java-Based Development:** The use of Java for the development of the app ensures robust performance and compatibility with a wide range of devices.

**6.Sustainability:** By reducing unnecessary driving in search of parking spaces, the app contributes to sustainable living and reduced carbon emissions.

**7.Contribution to Smart Cities:** The app is a significant step towards the vision of Smart Cities, where technology is used to enhance urban living.

Our introduces real-time parking space recommendation app a groundbreaking approach to real-time parking space recommendation, leveraging Java programming and interactive maps. By utilizing existing infrastructure and data sources instead of costly sensors or complex AI, our solution offers a user-friendly experience. It empowers drivers with up-to-date parking availability information, simplifying implementation and ensuring widespread accessibility. This novel approach represents a paradigm shift in parking management, prioritizing simplicity, affordability, and effectiveness, ultimately transforming the urban parking experience.

**DETAILS OF EXERCISES:**

The exercises introduce ………………………………………………………………………...

…………………………………………………………………………………………………..

…………………………………………………………………………………………………..

**Prerequisites:** Students should have some familiarity with …………………………………...

…………………………………………………………………………………………………..

…………………………………………………………………………………………………..

**Specific/ Expected Outcomes:**

After completing these exercises, students will be able to:

1. …………..
2. …………..
3. …………..
4. …………..

**Exercises/ Activities with the Timeline:**

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Activities/ Components** | **Timeline** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**EXERCISE NO. 1: ……………………………………………………………………………**

**Objective:** ……………………………………………………………………………………...

…………………………………………………………………………………………………..

…………………………………………………………………………………………………..

**Exercise Data/ Baseline Study/ Basic Information/ Study Area/ Experimental Setup:**

1. …………………………………………..
2. …………………………………………..
3. …………………………………………..
4. …………………………………………..

**EXERCISE NO. 2: ……………………………………………………………………………**

**Objective:** ……………………………………………………………………………………...

…………………………………………………………………………………………………..

…………………………………………………………………………………………………..

**Exercise Data/ Baseline Study/ Basic Information/ Study Area/ Experimental Setup:**

1. …………………………………………..
2. …………………………………………..
3. …………………………………………..
4. …………………………………………..

**EXERCISE NO. 3: ……………………………………………………………………………**

**Objective:** ……………………………………………………………………………………...

…………………………………………………………………………………………………..

…………………………………………………………………………………………………..

**Exercise Data/ Baseline Study/ Basic Information/ Study Area/ Experimental Setup:**

1. …………………………………………..
2. …………………………………………..
3. …………………………………………..
4. …………………………………………..

**EXERCISE NO. 4: ……………………………………………………………………………**

**Objective:** ……………………………………………………………………………………...

…………………………………………………………………………………………………..

…………………………………………………………………………………………………..

**Exercise Data/ Baseline Study/ Basic Information/ Study Area/ Experimental Setup:**

1. …………………………………………..
2. …………………………………………..
3. …………………………………………..
4. …………………………………………..

**EVALUATION SCHEME AND RUBRICS:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Parameters/ Rubrics** | **Rubric 1** | **Rubric 2** | **Rubric 3** | **Rubric 4** | **Rubric 5** | **Total Marks** |
| **CO (Level)** | **CO(L)** | **CO(L)** | **CO(L)** | **CO(L)** | **CO(L)** |  |
| **Marks** |  |  |  |  |  |  |

**STUDENT GROUP DETAILS WITH A PROBLEM STATEMENT:**

***(03 to 05 Students per Group)***

|  |  |  |  |
| --- | --- | --- | --- |
| **Group No.** | **Name of Student(s)** | **Roll No.** | **Problem Statement** |
|  | Abhijeet Kale (Team Leader). | B22 | Real Time Parking Space Recommendation |
| Abhimanyu. | B01 |
| Prashant Kaldhone. | B21 |
| Rujuta Naniwadekar. | B34 |

**PBL ACTIVITY PHOTOS:** *(Clicked during PBL Activities, Internal and External PBL Evaluation etc.)*

**Date:**

**Internal Evaluation Sheet for Course Level/ Multi Course Project Based Learning (PBL) 2023-24 Even Semester**

**Class:** S.Y.B.Tech/T.Y.B.Tech/ Final Year B.Tech \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Engineering

**Title of the Course:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Course Code: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Course Coordinator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EVALUATION BY INTERNAL FACULTY MEMBERS:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group No.** | **Name of Student(s)** | **Roll No.** | **Marks** | | | | | **Total Marks**  **(……)** | **Remarks**  **(Rank)** |
| **Rubric 1** | **Rubric 2** | **Rubric 3** | **Rubric 4** | **Rubric 5** |
| **CO(L)** | **CO(L)** | **CO(L)** | **CO(L)** | **CO(L)** |
| **Marks** | **Marks** | **Marks** | **Marks** | **Marks** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Course (PBL) Coordinator** | **Internal Subject Expert** | **Head of the Department** |
| Name and Signature with Date  Affiliation | Name and Signature with Date  Affiliation | Name and Signature with Date  Affiliation |

**Date:**

**External Evaluation Sheet for Course Level/ Multi Course Project Based Learning (PBL) 2023-24 Even Semester**

**Class:** S.Y.B.Tech/T.Y.B.Tech/ Final Year B.Tech \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Engineering

**Title of the Course:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Course Code: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EVALUATION BY EXTERNAL INDUSTRY/ ACADEMIA EXPERT:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Group No.** | **Name of Student(s)** | **Roll No.** | **Marks** | | | | | **Total Marks**  **(……)** | **Remarks**  **(Rank)** |
| **Rubric 1** | **Rubric 2** | **Rubric 3** | **Rubric 4** | **Rubric 5** |
| **CO(L)** | **CO(L)** | **CO(L)** | **CO(L)** | **CO(L)** |
| **Marks** | **Marks** | **Marks** | **Marks** | **Marks** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Course (PBL) Coordinator** | **External Expert** | **Head of the Department** |
| Name and Signature with Date  Affiliation | Name and Signature with Date  Affiliation | Name and Signature with Date  Affiliation |

**Date:**

**Result Sheet for Course Level/ Multi Course Project Based Learning (PBL) 2023-24 Even Semester**

**Class:** S.Y.B.Tech/ T.Y.B.Tech/ Final Year B.Tech \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Engineering

**Title of the Course:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Course Code: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Group No.** | **Name of Student(s)** | **Roll No.** | **Problem Statement** | **Total Marks Obtained Out of (….)** | **Remarks (Rank)** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Course (PBL) Coordinator** | **External Expert** | **Head of the Department** |
| Name and Signature with Date  Affiliation | Name and Signature with Date  Affiliation | Name and Signature with Date  Affiliation |