

KHOJ

WINTER SCHOOL 2022



**NAVRACHANA
UNIVERSITY**

KHOJ WINTER SCHOOL

December 2022

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ABOUT KHOJ WINTER SCHOOL – 2022

The Khoj program has been one of the defining social immersion activity at Navrachana University. Conceived right during the inception of the University, the Khoj program was envisaged to be a vehicle to inculcate social awareness, empathy and inter-disciplinary skills amongst our students, with a larger aim of proposing solutions to societal problems through innovation.

To further strengthen these foundational ideas of Khoj program and to engage on topics that are relevant and can be made visible to the society at large, the program is now conceived as a larger and more ambitious activity that is undertaken by students and faculty members during the semester break under the umbrella of KHOJ WINTER SCHOOL. The aim is to administer the Khoj program as intense, rigorous and field based activity in workshop mode while addressing a pressing social issue in the region in and around Vadodara. This format should lead to an uninterrupted and concentrated involvements of the students and their mentors.

Faculty members of Navrachana University, have proposed some very innovative and relevant Khoj Projects, that they wish to pursue with the student. The project touch upon various contemporary issues of concerns such as urban labor, migration, traffic, ecology, farming practices, public spaces, social behaviour etc. to name a few. This time around the students are free to choose Khoj project of their choice. Most Khoj project will demand either an inter-disciplinary or multi-disciplinary ways of working and hence we would also want students from different Schools to sit together in the projects and try and understand the issue and find solution through collaboration.

The Khoj Winter School will end in a public exhibition of all the project during the first week of January, 2023.

Prof. Pratyush Shankar
Provost, Navrachana University
November 2022

Waste Management Awareness and Practices among School Students.

Code: KHJ101



Dharti Parikh, Assistant Professor,
School of Business and Law.
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Duration: 19-12-2022 to 28-12-2022

Abstract:

The goal of the project is to get students involved in helping to educate school children about waste management. Students must be aware of environmental issues in order to efficiently fulfil their part in sustainable waste management. Hence, students will speak with higher secondary students from the chosen schools in the Vadodara region and find out how they are coping with the rubbish in their immediate surroundings. Following their understanding of the students' real behaviours, they will instruct the students on the significance of waste disposal for the sustainability of the environment.

Learning Objective:

- To educate students about their social responsibility to waste management.



Pedagogy:

This project will be divided into three sections:

- Students will contact school students to gain an understanding of and practice with waste management (with the permission from school authorities).
- Next, students will create a questionnaire to collect data and obtain information.
- Based on the information gathered, students will create an awareness campaign to encourage more waste management among school-aged students.



Advaita Jalan, Associate Professor,
School of Environmental Design and
Architecture.

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Duration: 19-12-2022 to 28-12-2022

Abstract:

Flyovers are typically constructed to reduce travel time and release traffic congestion for local and regional commuters travelling across city especially during peak hours. When these are constructed, they cater to the larger objective of creating ease of movement for commuters and reduction in travel time for them but what it misses out in the process is the impact it creates on the street life. Small to large businesses, residences, and other activities occurring at street level gets hampered effecting the functioning of these places and overall urban life of communities using these spaces. The relation of built to street to flyover and the spaces beneath need to be assessed contextually and the problems occurring within these cross section of streets needs to be investigated coherently to understand the impact of flyovers on urban life.

Learning Objective:

The key learning objectives of this study are,

- To facilitate an understanding about the relation of streets and flyovers within an urban setting.
- To sensitize students regarding the impact of flyover on urban life and economy.
- To develop an approach regarding the multidisciplinary process and method adopted to undertake systematic study of such nature.



Pedagogy:

The premise of this study is based on empirical (on-site) approach focusing on primary case study of flyover within the urban setting of Vadodara city. The method adopted for this study will comprise of following stages:

A. Theoretical Premise:

- An introduction to urban setting and street life.
- Process and Approach for Study

B. Empirical Study:

- Identification of flyover
- Reviewing micro setting with reference to larger context of the city
- Observations and mapping- illustrating current scenario
- Surveys: Interviews of stakeholders / survey with questionnaire (google form and hard copies) – reviewing scenario before and after intervention of flyover
- Recreating- Illustrations of before and after scenario

C. Analytical Study: overlaying of layers

D. Inferences: Derived from analytical study

E. Compilation: Of study in form of Booklet / Report

Automatic Irrigation System using soil moisture sensor

Code: KHJ103



Dr. Amarish Badgujar, Associate Professor, School of Engineering and Technology
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Co-faculty member:

Mr. Adil Khan (Assistant Professor- SET)

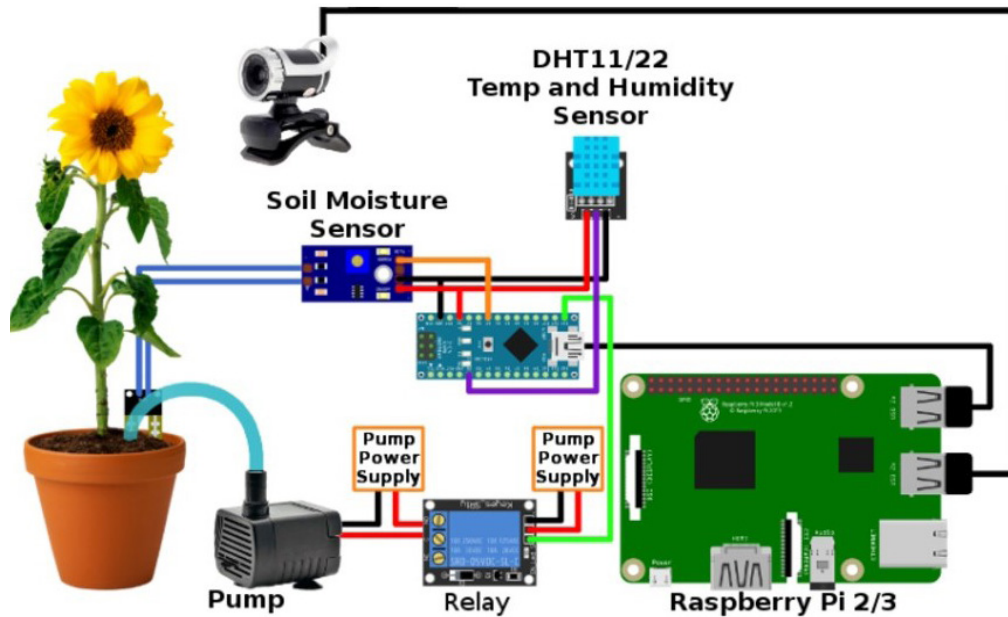
Duration: 19-12-2022 to 28-12-2022

Abstract:

In India, agriculture contributes about 16% of total GDP and 10% of total exports. Adequate water supply is very important for the agriculture. At many places there is a shortage of water and there is also a lot of water wastage. In order to optimize the use of water and reduce manpower and time for the irrigation this project has been proposed. In this proposed project, the soil moisture will be measured using a sensor and the land will be automatically irrigated by a pump.

Learning Objective:

- Use of technology in Irrigation System
- Bringing awareness of issues in farming
- Learning importance of saving water



Pedagogy:

- Laboratory discussions, review of the existing irrigation system, identifying the site/application and model Making or system development.

Stray Animals and Public Health in Vadodara City

Code: KHJ104



Ankita Sharma, Assistant Professor,
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Duration: 19-12-2022 to 27-12-2022

Abstract:

The growing number of stray animals has become a major societal issue. The increase in stray animals is due to a number of factors. The goal of this study will be to determine the causes leading to increase in stray animal population and examine the effects of stray animals on public safety and health. An effort would be made to evolve diverse approaches to manage the stray animals.

Learning Objective:

- To find the causes of the rising stray animal population and investigate further how stray animals affect people's health and safety. Based on the findings of the investigation, offer recommendations for the management of stray animals.



Pedagogy:

- Classroom Session, Field Visits.

E-waste management: Awareness and Strategies.

Code: KHJ105



Dr. Brijesh Shah, Assistant Professor,
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Co-faculty member:

Dr. Shenaz Solanki (Academic Associate-SoS)

Duration: 19-12-2022 to 31-12-2022

Abstract:

According to reports, only 22.7 % of 10 lakh tonnes e-waste generated in 2019-20 was collected, dismantled, recycled or disposed of in India. It was 21.35% in 2018-19 and 9.79% in 2017-18. These numbers show poor management and less awareness on handling of E-waste. Vadodara was the first city in India to launch the first pilot project on handling of E-waste. And due to lack of response and awareness among the citizens, this initiative was not successful. Further, recycling of e-waste generates 69 precious elements of the periodic table; some of them are highly precious and of strategic importance in nature. It would be tough to devise mechanisms for manage e-waste. Moreover, we will conduct some surveys & take some public opinion on the present e-waste collection system, based on data we will analyse the system and do some brainstorming for the betterment of the process. During the same time will try to do some laboratory work on lab-scale process development for the extraction of precious metal ions.

Learning Objective:

- Survey on e-waste collections.
- Establishing the link between local municipal corporation team and people for e-waste disposal.
- Develop some in-house research activity to handle e-waste, If possible, in collaboration with industries.



Pedagogy:

- For survey: Interaction with people + Preparation of questionnaires.
- Establishment of link between VMC and people: Group discussion.



Dr. Viren Parikh, Assistant Professor, School of Engineering and Technology

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Co-faculty member:

Dipali Pandya (Assistant professor-SET)

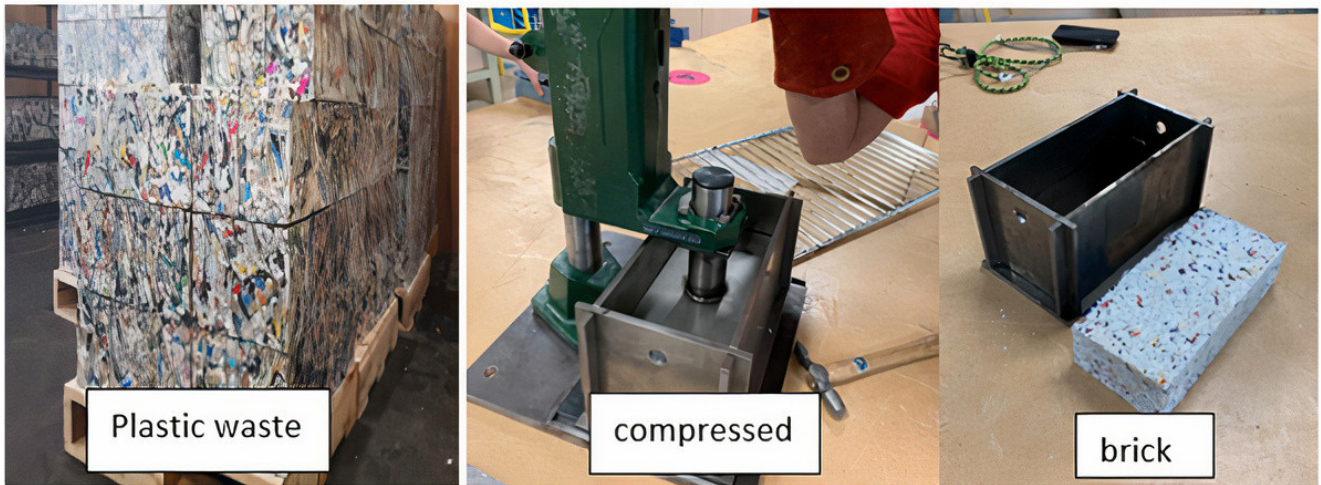
Duration: 17-12-2022 to 27-12-2022

Abstract:

The plastic waste is the hazardous problem in today's world. This is most dangerous problem in front of humanity. The most hazardous type of wastes are HDPE and PTE and the plastic below 50micron is also causing a serious problem. These plastic mixed in the soil, it directly effects on fertility of the soil. Nowadays, the large amount of plastic is deposited into sea. This plastic wastes gives hazardous effect on the aquatic life and quality of seawater also polluted by this plastic. So, we try to finding efficient way to solve this problem of plastic waste. So, we will add this plastic wastes into the bricks and create the bricks by using plastic wastes. It is most economical solution present in the construction industry and it is also economical and environment friendly solution of the plastic wastes.

Learning Objective:

- Collection and segregation of plastic waste.
- To develop an efficient way and to effectively utilize the waste plastics.
- To reduce the consumption of natural resources such as clay for the manufacturing of bricks.
- To minimize and reuse generation of waste plastic on the land and water to avoid land and water degradation and consequent pollution hazard.
- To produce cost-effective construction materials
- To reduce the plastic in waste streams saving non-renewable resources.



Plastic waste is compressed into bricks

Pedagogy:

- Conducting in depth literature review for understanding collection, separation, disposal of plastic wastes.
- Determination of parameters to manufacture construction material based on waste plastic.
- Checking the adequacy of developed plastic bricks.

Income and Employment Situation of Informal Workers in the city of Vadodara

Code: KHJ107



Dr. Rabichandra Singh Elangbam,
Assistant Professor, School of Business and Law.
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Co-faculty member:

Dr. Ketan Kothadia (Assistant professor-SBL)

Duration: 19-12-2022 to 30-12-2022

Abstract:

The Indian Economy is characterized by the existence of a vast majority of informal or unorganized labour employment. In the Economic Survey of 2007-08, the organised labour employment was almost 93% and as per the Economic Survey 2021-22, it came down to 82.17% of India's workforce under unorganized sector. However, it is still a matter of concern that majority of the workforce is still under the unorganised sector. The unorganised workers' social security act, 2008 was implemented to protect and provide social security and welfare for the unorganised workers and for other matters related to them. In this study we are going to find out in the city of Vadodara, Gujarat the income and employment situation for the daily wage workers which are in unorganised sector. The study will include primary data as well as the available secondary data.

Learning Objective:

- The scenario of specific informal workers, the laws related to labour, policy framework in the labour laws such as minimum wages act, the unorganised workers' social security act etc.



Pedagogy:

- The project will be based on brief introduction of informal workers and their types, primary data survey as well as collecting secondary data and research work available especially Gujarat.
- There will be inputs to be taken from law faculties and labour law experts, NGOs etc.

Bridging the gap between wastage of food & hunger through technology.

Code: KHJ108



Firdos Solanki, Assistant Professor,
School of Business and Law
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Duration:19-12-2022 to 29-12-2022

Abstract:

Wastage of cooked food due to perishability, excess quantity, order rejection, etc. happens every day in and around Vadodara. On the other hand, a lot of below the poverty line individuals go either hungry or eat poor quality foods out of necessity. Our idea is to quantify this problem and explore the possibility of wireframe model for peer-to-peer voluntary based tech enabled solution for traceability, real time tracking and autonomous supply chain that bridges this gap.

Learning Objective:

- The operating processes of B2B & B2C food industry, inventory management practices of B2B & B2C food industry, identifying reasons for hunger with underprivileged population, mapping of system requirements for tech enabled solution.



Pedagogy:

- Classroom sessions, Field Visit, Guest lecture from NGOs, Case Studies, Simulations

Cattles and their diseases: Understanding for the Healthier future.

Code: KHJ109



Ms. Foram Patel, Academic Associate, School of Science

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Co-faculty member:

Dr. Parth Pandya (Assistant Professor-SoS),

Ms. Harshita Johari (Teaching Assistant-SoS)

Duration: 17-12-2022 to 31-12-2022

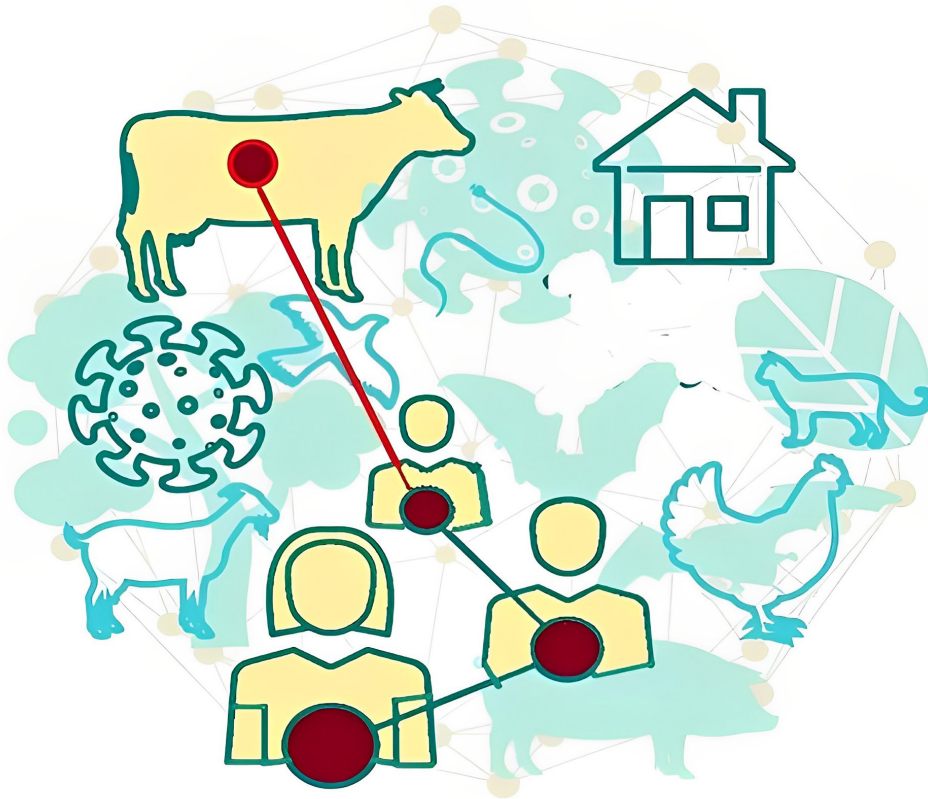
Abstract:

Vadodara is one of the major centres of Gujarat related to livestock economies; Wherein cows (444071) and buffaloes (385583) accounts for the major cattle population followed by the industry of poultry, sheep and goat. With such higher number of livestock, zoonotic diseases have become an emerging concern in public health, the livestock economy, and in the wildlife sectors. From the identified zoonotic diseases, infections can be transferred from animals to humans and are fatal to both. Thus, the current inventory is designed to identify the disease prevailing among the cattle (cow & buffalo) of Vadodara city and the precautions that must be taken by cattle keepers, as well as to spread awareness regarding a good hygiene and vaccinations available for it.

Learning Objective:

From this study the student will be able to:

- Understand the different types of cattle found in Vadodara.
- Enlist the economic value they possess in our growing economy.
- Figure out the difficulties that the cattle rearers of the city faces.
- Spread the awareness regarding different disease conditions prevailing in cattle.



Source: UN Environment Programme, 2020

Pedagogy:

- We will be applying Classroom discussions and field-based pedagogy.
- First of all, students will be taught about the cattle types and role in the shaping the economy through different modes (Videos, Presentations etc). Field visits to various byre or cow sheds (around 3-5 sites) will be conducted. This will be accompanied by collection of data on the sites and the statistical analysis using computer tools.



Hetal Desai, Assistant Professor,
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Co-faculty member:
Hetal Desai

Duration: 19-12-2022 to 24-12-2022

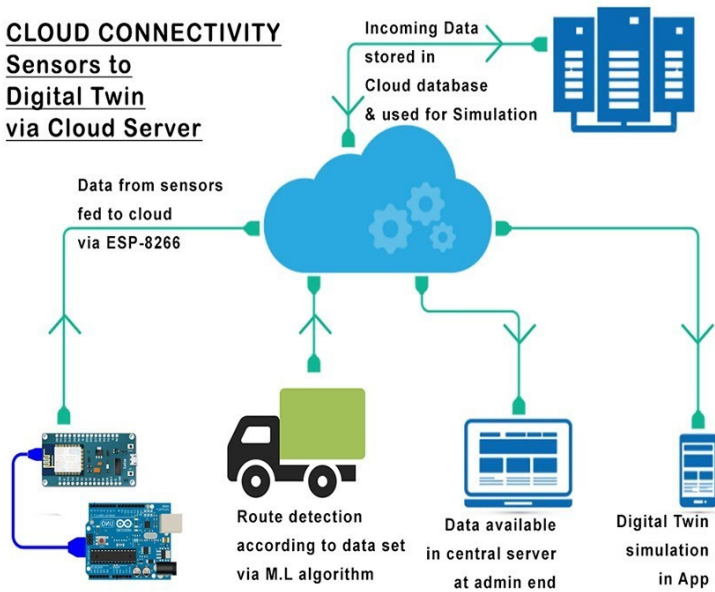
Abstract:

The amount of waste has been increasing due to the increase in human population and urbanization. In cities, the overflowing bin creates an unhygienic environment. Thus degrades the environment, to overcome this situation “Automatic Waste Segregator” is developed to reduce the work for the rag pickers where they wastes are segregated by the human beings which leads to health problems to the workers. The proposed system separates the waste into three categories namely wet, dry and metallic waste. This developed system is not only cost efficient also makes the waste management productive one. After the segregation it is important to recycle it and promoting its thoughtful consumption.

Learning Objective:

- Managing and Successfully Delivering a solution to waste management by a diverse and cross-departmental Team

CLOUD CONNECTIVITY
Sensors to
Digital Twin
via Cloud Server



Pedagogy:

- Classroom teaching for basics of IOT knowledge, waste collection method at university level, waste management at VMC level.

Alternative to conventional materials – Waste to wealth creation.

Code: KHJ111



Dr. Hiral Parikh, Assistant Professor, School of Engineering and Technology
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Duration: 19-12-2022 to 27-12-2022

Abstract:

The idea is to use waste materials like sugarcane fibre/ coir/ rice husk/ eggshells/ animal feathers (natural fibres) as reinforcement with polymer matrix to develop a new material. The developed material can be used as a conventional metal or wood substitute to make different articles. The hydrophilic nature of natural fibres will be reduced through chemical treatment to improve adherence between reinforcement and matrix to produce a sustainable product.

Learning Objective:

- Exploring waste material which can be used as reinforcement, creating new materials and articles, Insights into composite materials, manufacturing of composite materials.

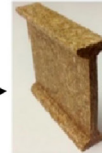
Agricultural Waste



+



Composite Manufacturing



Pedagogy:

- Classroom teaching, Hands on session on manufacturing of composite material.



Dr. Karan Rana, Assistant Professor, School of Science

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Co-faculty member: Dr. Ankita Doshi (Assistant Professor-SoS), Dr. Elizabeth Robin (Associate Professor-SoS)

Duration: 19-12-2022 to 29-12-2022

Abstract:

The list of benefits provided by street trees is long and diverse. Tree lined streets provide much-welcomed aesthetic beauty and visual relief in concretized city settings, and supply a range of psychological, social and economic benefits for residents and businesses including reductions in domestic violence, lowering of obesity, higher property values, reductions in asthma levels, traffic speeds, and auto accidents, and overall improvements in human well-being and community vitality. Other, equally significant ecological and environmental benefits are provided by street trees. Yet, despite extensive evidence of the critical role played by street trees in city environments, urban planners and managers have often undervalued the role played by street trees. Vadodara is rapidly losing tree cover in public spaces including on roads. This study aims to study the distribution of street trees in urban and rural areas of Vadodara, to assess differences in tree diversity and species composition across roads of different widths, and to investigate changes in planting practices over time.

Learning Objective:

- To investigate whether planting practices have changed over time, by examining the size distributions of the ten most dominant tree species as a proxy for age.



Pedagogy:

- 3 major streets from the city road map and 2 streets from rural areas will be demarcated. Then field studies will be carried out to document the diversity and distribution. GPS readings, for each tree will be taken using Google Maps, also it will be Geotagged. Photographic documentation would be done for all the tree species in their vegetative, flowering and fruiting stages. Moreover, the cases for tree vandalism would be documented.

Code: KHJ113

To identify the natural substitute for synthetic Mosquito repellents as a preliminary measure against vector-borne disease in Vadodara city.



Dr. Krutika S Abhyankar, Assistant Professor, School of Science

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Co-faculty member: Dr. Elizabeth Robin (Associate Professor-SoS), Ms. Harshita Johari (Teaching Assistant-SoS)

Duration: 19-12-2022 to 30-12-2022

Abstract:

Every year Vadodara city experiences dengue, malaria, and chikungunya cases, and the root cause is various mosquito vectors. Additionally, synthetic mosquito repellents contain pyrethroids (as the principle component) which are known for causing excitability in the nervous system by affecting the sodium channels. The use of these synthetic repellents is known to cause allergies, inflammation, and rashes. Thus, the present project intends to investigate the use of synthetic repellents in Vadodara city and to identify alternative natural and cost-effective ways to combat perilous conditions caused by mosquito vectors.

Learning Objective:

- Students will address and analyse the current trending issues faced by the people of Vadodara.
- Students will be able to identify different mosquito vectors based on morphology.
- Students will be able to learn about the life cycle of mosquito vectors.
- Students will learn about natural plant-based remedies to fight against mosquito vectors.

Natural Substitutes
???

To identify the natural substitute for synthetic Mosquito repellents as a preliminary measure against vector-borne disease in Vadodara city

Side effects:

- Excitability in the nervous system
- Allergy
- Presence of pyrethrin toxic to organs

Pedagogy:

- Cross-over learning: To explain the significance of the survey for the research and to plot the valid questions related to the problem identified.
- Connected community: To help and spread awareness by interacting with the locals and share their learnings.
- Sharing their ideas: Students in the group can share the ideas and can help others to carry forward the best approach for the study.
- Innovation and creativity: Student can utilize their creativity to make a awareness videos.



Monika Shah, Assistant Professor,
School of Engineering and Technology
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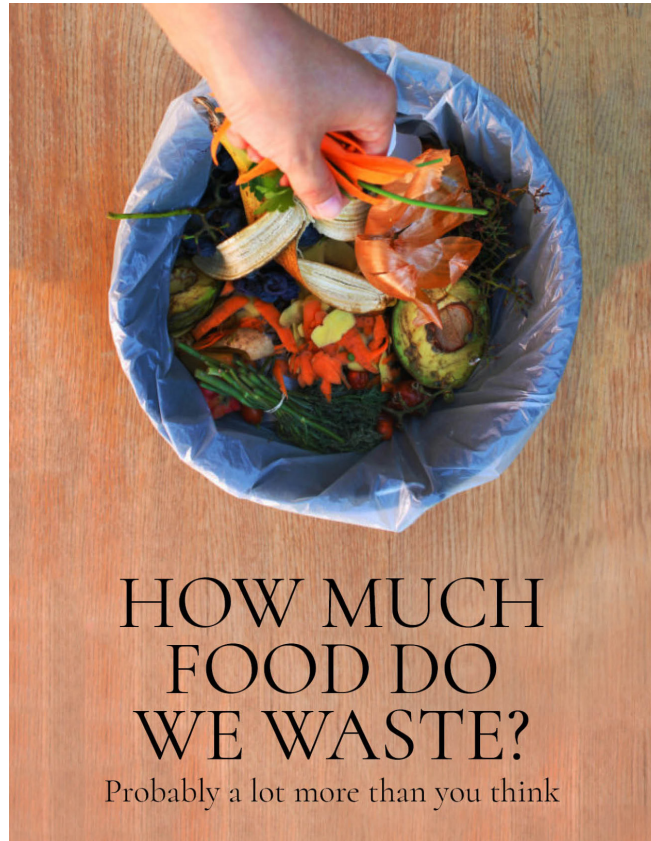
Duration: 17-12-2022 to 22-12-2022

Abstract:

Solid waste management (SWM) is a tough and challenging task for the growing and developing cities. Apart from the industrial waste and municipal solid waste, waste generated from restaurants and eateries significantly load the SWM system of Vadodara Municipal Corporation. Restaurants and eateries generate food waste, fruits and vegetable peels, paper and plastic waste, and much more. Food waste is not only a major social or humanitarian concern, but an environmental concern too. Wastage of food misspend all the energy and water it takes to grow, harvest, transport, and package it. Food waste which goes to the landfill and rots, produces methane — a greenhouse gas even more potent than carbon dioxide. Hence effective solution of such waste systems is required to be designed. A food waste management system requires to handle the key issues related to generation of waste, segregation of waste, and transportation of the waste towards appropriate solution of the waste disposal.

Learning Objective:

- After studying and designing a food and beverage waste management system, the following concepts are expected to be well understood Elimination of litter and untreated waste helps better hygiene and health conditions for the community. The digestible gas produced after the anaerobic decomposition of waste can be sold for money. Effective waste management at source can eliminates the fee included for food waste treatment. Energy produced during waste decomposition, such as heat/electricity generated could be sold. Reduces landfills. Replaces the usage of LPG.



HOW MUCH FOOD DO WE WASTE?

Probably a lot more than you think

Pedagogy:

- The following activities with pedagogy are required to be done for waste management: Survey in various restaurants of Vadodara city: Pedagogy (Interviews and question & answers)Literature survey: Pedagogy (Classroom discussion)Data Analysis: Pedagogy (Classroom discussion)Possible Solution: Pedagogy (Classroom discussion).

Financial Literacy among Women engaged in unorganized sector

Code: KHJ115



Dr. Nikita Mehta, Assistant Professor,
School of Business and Law
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Duration: 19-12-2022 to 24-12-2022

Abstract:

The project is proposed to engage students to work in the direction of financial literacy among women engaged in unorganized sector. They will contact known and unknown people through visits and understand their financial savings habit. On understanding the current situation, the participants will guide them about importance of availing various government schemes and judiciously planning finances. It serves the purpose of financial planning and its awareness among such beneficiaries where uncertainties displace them significantly.

Learning Objective:

- Sensitize the participants to understand and help women from unorganized sector.



Pedagogy:

- The entire project is divided in three phases; first, secondary study to understand various schemes suitable for beneficiaries shortlisted in the project, second, to do a survey of their current practices of savings, third, participants shall work as an enablers to help them in bringing awareness regarding importance of rational financial planning.

Assessment of the health status of Bhayli and Gotri Ponds of Vadodara.

Code: KHJ116



Dr. Parth Pandya, Assistant Professor,
School of Science
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Co-faculty member:
Dr. Jeetendra Salunke (Assistant Profeso-
SOS)

Duration: 17-12-2022 to 31-12-2022

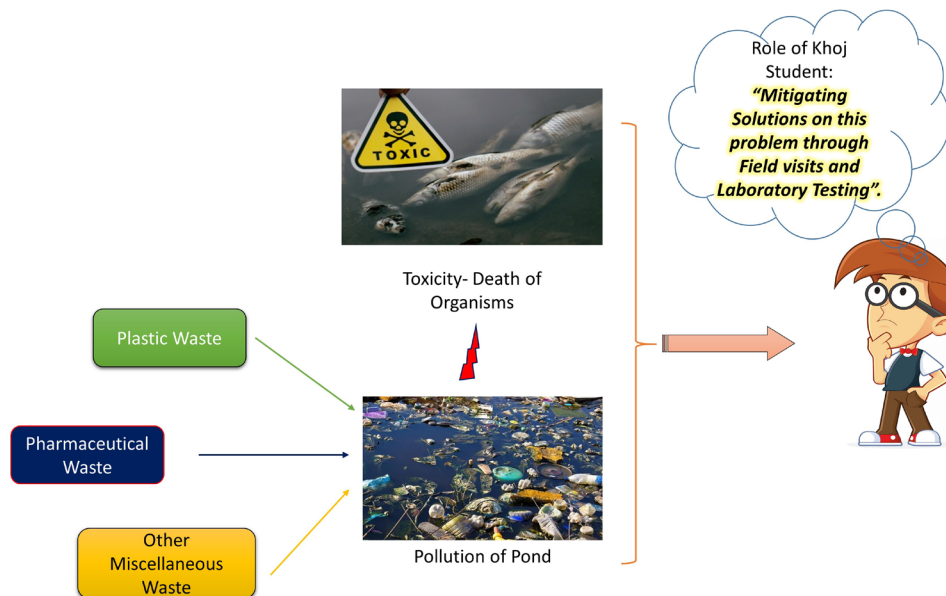
Abstract:

Pond ecosystem is considered to be an integral part related to animals and Humans. They have been studied individually for their biodiversity and/or toxicity. In the present inventory, we intend to evaluate both and avail a holistic view. Furthermore, the study will also address the community living in the region by creating awareness. To address this, we have selected two ponds i.e., Gotri pond and the Bhayli pond, both of which have not been studied with respect to the above two objectives. Additionally, the selection is based on the type of food the community eats, for instance, edible fish. We also intend to orient the community and make them aware of possible pollution and toxicity created by plastics, and metals present in the pond and how they might affect organisms including humans. The study will involve both laboratory evaluations and survey-based data collection. The outcome of the study may help mitigate pollution related health hazards and also provide data for the themes, Swachh Bharat and Swasth Bharat Abhiyan.

Learning Objective:

The study will help the students to :

- Understand how an ecosystem function.
- What is the importance of different organisms in an ecosystem
- Deleterious effects of pollutants/toxicants on the organisms.
- How to interact with the local community and how to spread awareness regarding a burning issue.
- Develop a scientific approach for dealing with and mitigating a problem



Pedagogy:

- **Day 1-** Students will be oriented regarding the problem. This will be done through group discussions and lecture-based pedagogy.
- **Day 2-10** We will be visiting the two ponds and simultaneously meeting the people in the region. We will be collecting the water samples and understanding the diversity and the types of plastics present in the region. The field visits will be continued till the 3rd last day of the program. This will be accompanied by analyses of chemical parameters in the laboratory-based pedagogy. The last three days will be devoted to statistical analyses, report preparation and if possible, pamphlet distribution amongst

On Safety investigation of the existing bridges in Vadodara through survey and case studies



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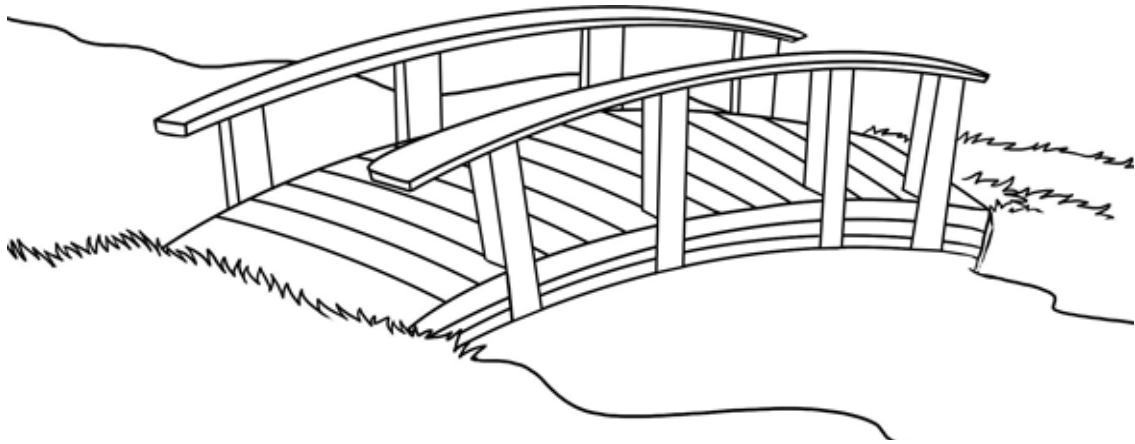
Duration: 17-12-2022 to 31-12-2022

Abstract:

This Khoj Project is motivated from the incidence of the collapse of the Morbi bridge event happened on October 30, 2022 causing lost of many lives. It is necessary to understand for the community and people to know how safe is our bridges. In this project, students will do the survey of the bridges built in Vadodara and to investigate what leads to the occurrence of the failure and to understand its mechanism required to make the bridge safe and suggests the engineering lessons to be learned through measurements, small calculations, survey and case studies.

Learning Objective:

- Students will be able to understand the basics and fundamental of the bridge design, construction and processes through field visits, survey and case studies
- Practical aspects of the engineering design
- Drawing, sketching, photographic interpretations
- Use of software and calculations to understand engineering design
- To learn the safety measurements in engineering design.



Pedagogy:

- Survey, case studies, measurements, photography and interpretations, line diagrams and sketches, small calculations, usage of software's.

Nature, Culture & City- Banyan Trees of Vadodara.

Code: KHJ118



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Duration: 23-12-2022 to 31-12-2022

Abstract:

Vad or Banyan is the tree from which the city of Vadodara gets her name. For the city it has been a part of the cultural identity and collective heritage. These trees, many of which are around a century old, are present in the many historical precincts, public places and roadside in Vadodara.

In the recent past many Vad trees have been removed, largely due to pressures of development. This raises a concern that the tree has perhaps become more of an historical object, far removed from imagination of urban setting and environment. Hence, it is important that the cultural importance of these trees in past and its relevance in present is better comprehended.

Under this topic, students would document and analyse the values and meanings associated with these trees from spatial, cultural and environmental perspectives to develop understanding of relation between these trees and the city. The focus area would be old city of Vadodara (East of Viswamitri river)

Learning Objective:

- To develop sensitivity towards the relationship between humans and nature in urban setting.
- To be able to appraise, infer and critique the meanings, cultural values and its transformation related to nature (through Banyan tree) in urban setting.
- To develop methods of documentation, analysis and representation for a research topic



Pedagogy:

The study would include the following:

- Day 1 (4 hrs.): introduction to the project & literature studies : Lecture, discourses and field visit
- Day 2 & 3 : (4+4 hours.) On site physical mapping of trees and identification of case studies : field work
- Day 4 : (4 hours) Presentation of mapped data and literature study; finalisation of case studies and parameters of study : Student presentation, discussion and discourse
- Day 5 & 6: (6+6 hours) Detailed survey and site documentation : Field work and on-site discussion
- Day 7: Holiday (Christmas)
- Day 8, 9 & 10 (5+6+6 hour): Representation, analysis and compilation : Discussion, discourses & Student Presentations

Smart Street Lights with Solar Panels for Vadodara City

Code: KHJ119



Prakruti Shah, Assistant Professor, School of Engineering and Technology

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Co-faculty member:

Dr. Shweta Dour (Assistant Professor-SET)

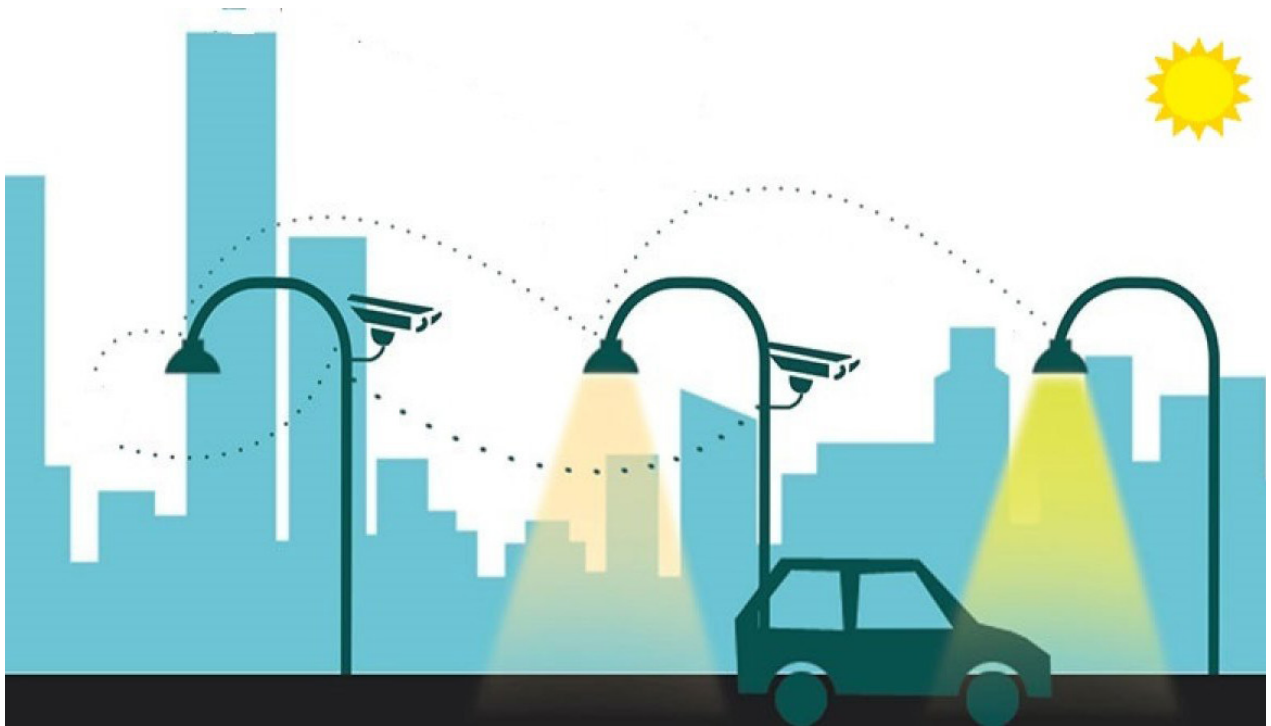
Duration: 19-12-2022 to 26-12-2022

Abstract:

The project entitled “Smart Street Lights with Solar panels” focuses on saving of power consumption with aesthetic appearance. Streetlights form an integral part of any developing city. The existing systems for street lights work on full power mode from sunset to sunrise. This leads to unwanted electricity consumption, thus leading to enormous electricity bills. Owing to the fact that street lighting is one of the largest energy expenses for a city, an intelligent street lighting system could reduce municipal street lighting costs as much as 50% - 70%. The proposed system would aim at controlling the switching of the lights on the basis of daylight intensity and presence of human intervention. At times of cloudy and stormy weather it happens that the daylight is very less and thus raises the requirement of the streetlight to be ON. Another feature of the proposed system would be the switching OFF the lights with the absence of any kind of movement on the street. Since it can switch automatically with the use of appropriate sensors in Street Light assembly, thus leading to energy conservation which is need of an hour. The proposed system will be enabled with an additional feature of available renewable source in form of solar energy.

Learning Objective:

- The importance and merits of Renewable energy sources (Solar),
- Sensor applications



Pedagogy:

- Discussion, Research, Prototype model making

A Study of Causes of Screen Addiction among Kids and Raising Awareness among Parents about Alternative Solutions

Code: KHJ120



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Duration: 19-12-2022 to 31-12-2022

Abstract:

In today's media-driven world, parents use screens to keep kids entertained or distracted while they are busy in their life. It works as screens captivate children's attention and engage in a way almost nothing else does, allowing parents a bit of time to engage in their daily activities. But what is the effect of screens on kids mind and how much screen time is enough time? Research revealed that the offline and off-screen is essential for kids growth as learn, improve their social and interpersonal skills and be healthier and happier in the future. Patricia Kuhl (a researcher) runs experiments with 4,000 plus babies each year. She commented that "What we've discovered is that little babies, under a year old, do not learn from a machine...". You get genius learning from a live human being, and you get zero learning from a machine." Perhaps that is why the WHO recommends no screen exposure for babies under the age of two and no more than one hour of screen time a day for babies between the age of two to four.

Learning Objective:

- To understand the problem of screen addiction amongst kids and address the possible solution.



Pedagogy:

- Research to understand the factors that cause screen addiction.
- Literature review and brainstorming amongst students to suggest possible ways to reduce the screen addiction.



Dr Umme Salma M Pirzada, Assistant Professor, School of Engineering and Technology

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Co-faculty member:

Dr. Rishi raj balwaria (SLSE)

Duration: 17-12-2022 to 26-12-2022

Abstract:

Mobile phones have become a very essential part of our daily life. They help us to communicate, interact, search for information, work, relaxation and enjoyment. However, excessive use of mobile phones impact on physical and mental health of people. Most of youth engage in excessive mobile phones use, especially during COVID-19. Which create chronic sleep deprivation, and negative effects on cognitive control, academic performance and socioemotional functioning. Hence, study in this direction helps youth to identify the seriousness of the problem. The purpose of this project is to carry out a review of studies that links between use of mobile phones and mental health and to spread awareness among youngsters and their families regarding the issue. The study involves possible solution for the problem.

Learning Objective:

- Understand the criticalness of the link between usage of mobile phones and mental health. Spread awareness among youth and their families. Work on some practical measures to deal with the issue.



Pedagogy:

We will adopt the following methodology:

- Conduct the survey to collect the actual information of the proposed issue.
- Statistical analysis to understand the data
- We will take the opinion of physiologists and psychiatrists
- Work on the feasible solution based on the analysis results and doctor's suggestions



Shalini Amin, Assistant Professor,
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Duration: 20-12-2022 to 30-12-2022

Abstract:

The railways commissioned under the Gaekwad rule, completely changed the face of Baroda State as it connected the hinterland with the cities and unified all the far-flung territories. Soon after Baroda became one of the important centres of Indian railways. This project takes us back to the early years of railways in the Baroda state through a creative representation of the past. By juxtaposing the urban and rural context with the interior spaces of the railway carriage, the project wishes to bring to focus the impact of railways on the social and cultural fabric of the city and the countryside. Indian Railways has recently decided to preserve the five oldest, working narrow gauge lines dating back to the 19th century from complete extinction.

Learning Objective:

The primary learning objectives are as follows:

- To introduce significance of heritage through documentation of Narrow-Gauge Railway. To sensitize students towards local heritage and its related matter
- To enable students with an understanding about approaches adopted for undertaking study of such heritage structures



Pedagogy:

The premise of this study is based on empirical (on-site) approach. The method adopted for this study will comprise of following stages:

- Theoretical Premise: An introduction to historical relevance of Narrow-Gauge Railway of Baroda
Typology: Students will work on the documentation of narrow-gauge railway shed and the turntable
Historical Documentation: Making technical working drawings for Narrow Gauge Railway Shed and the Turntable
- Research Documentation: Based on Primary and secondary sources (from previous stage work and other sources)
- Visual Drawings / Illustrations: Compilation of work in form of a booklet and exhibition panels

Psychological impact of social media on youth

Code: KHJ123



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Dr. Lipi Buch (Assistant Professor-SOS)

Duration: 17-12-2022 to 31-12-2022

Abstract:

Social media platform is deliberately designed to hold the attention of users for a long time. The effects of such ample exposure can be harmful. Nonetheless, its use is inevitable in today's world. The best way to deal with this is to educate the youth

Learning Objective:

- To understand the impact of social media on the youth of Vadodara city.
- To create awareness among youth about the implications of overindulgence and unproductive usage of social media



Pedagogy:

- Surveys: Online and Offline, Psychological tests, EQ, SQ



Dr. Sumit Bhawal, Associate Professor, SoS
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Duration: 19-12-2022 to 30-12-2022

Abstract:

Industrial waste discharge is an uphill challenge faced by companies. Owing to presence of large number of chemical industries within Vadodara district, untreated waste discharge has impacted agriculture and allied activities severely owing to groundwater contamination. Among many, adsorption-based transformation of toxic industrial waste discharge into reusable water is a fast, simple, scalable, cost-effective option. It provides flexibility and scope to modify adsorbent material as per requirement and hence the preferred method in the current study.

Learning Objective:

- Create awareness among citizens (urban as well as rural), students and stakeholders regarding groundwater contamination owing to industrial waste discharge and its impact on agriculture activities and public health.
- Use of project-based learning approach using the experimental skills of the students and utilize the same for providing feasible approach to a societal problem.
- Inculcate critical thinking and research aptitude among students

☰ THE TIMES OF INDIA

This story is from March 19, 2019

CITY

Groundwater in Padra worse than industrial waste!

TNN | Mar 19, 2019, 09:48 IST



Pedagogy:

- Sampling of industrial waste discharge (sample collection within Vadodara district).
- Communication with the citizens in the neighbourhood of the industrial organizations to ascertain the nature of the problem and its implications on their day-to-day life.
- Developing experimental protocols to remove toxic contaminants in water and formulating strategies to transform the polluted water into at least class E reusable water for irrigation purpose.

Code: KHJ125

Safety evaluation of vegetables and cereals for common pesticides to sensitize the Vadodara populace and possible methods of elimination of such surface contaminants.



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Duration: 19-12-2022 to 31-12-2022

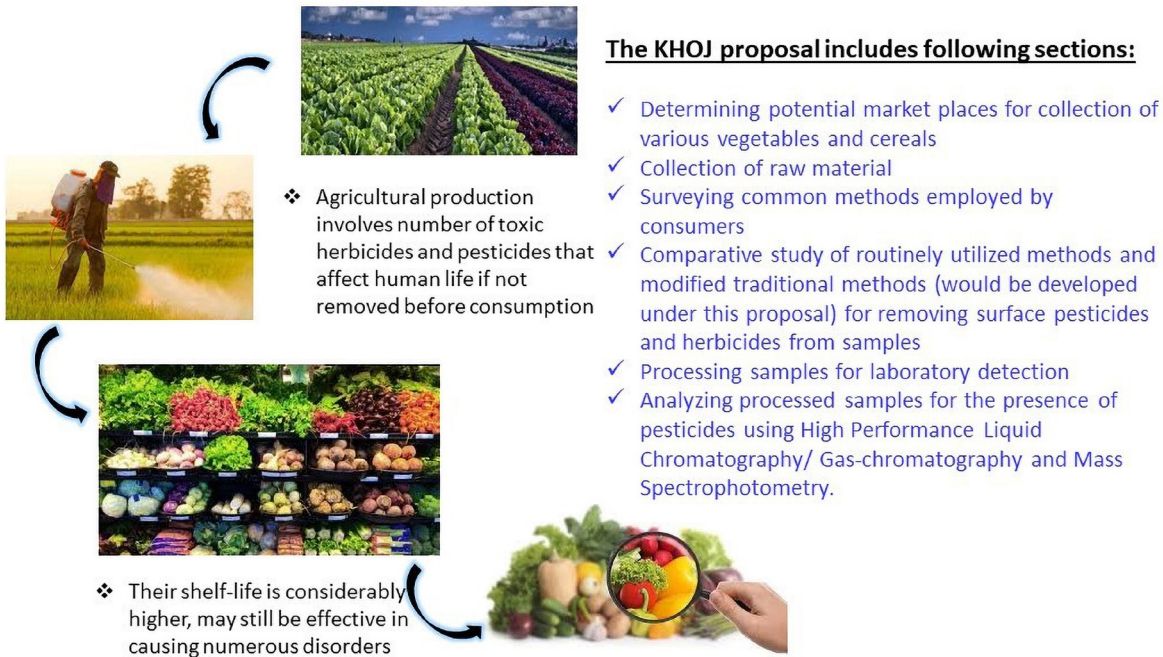
Abstract:

The present study is designed to assess the presence of pesticides in vegetables and cereals grown in Vadodara district and evaluate various methods of their possible elimination, adaptable by general population. The field grown samples of cereals and vegetables will be collected and analysed for the presence of different pesticide residues and compared with their maximum permissible limits. In addition, a number of ancient/traditional methods of processing vegetables and cereals before cooking would be assessed for their potential to eliminate and/or minimize the amount of surface-pesticide residues. The results obtained would help in understanding the levels of pesticides as well as possible health risks associated with their consumption. This would also help as a prerequisite for further studies wherein monitoring of pesticides and other toxic contaminants in different samples can be done for creating awareness on the pesticide-associated cumulative health risks in the population of Vadodara

Learning Objective:

During the course of this project, students will be able to,

- Understand sampling methods for scientific research.
- Learn different types of pesticides found in vegetables and cereals.
- Understand the harmful effects of pesticides on human health.
- Evaluate possible measures to be taken to eliminate surface contaminants in vegetables and cereals.



Pedagogy:

- Survey reports on pesticide assessment, research articles and papers and video lectures.



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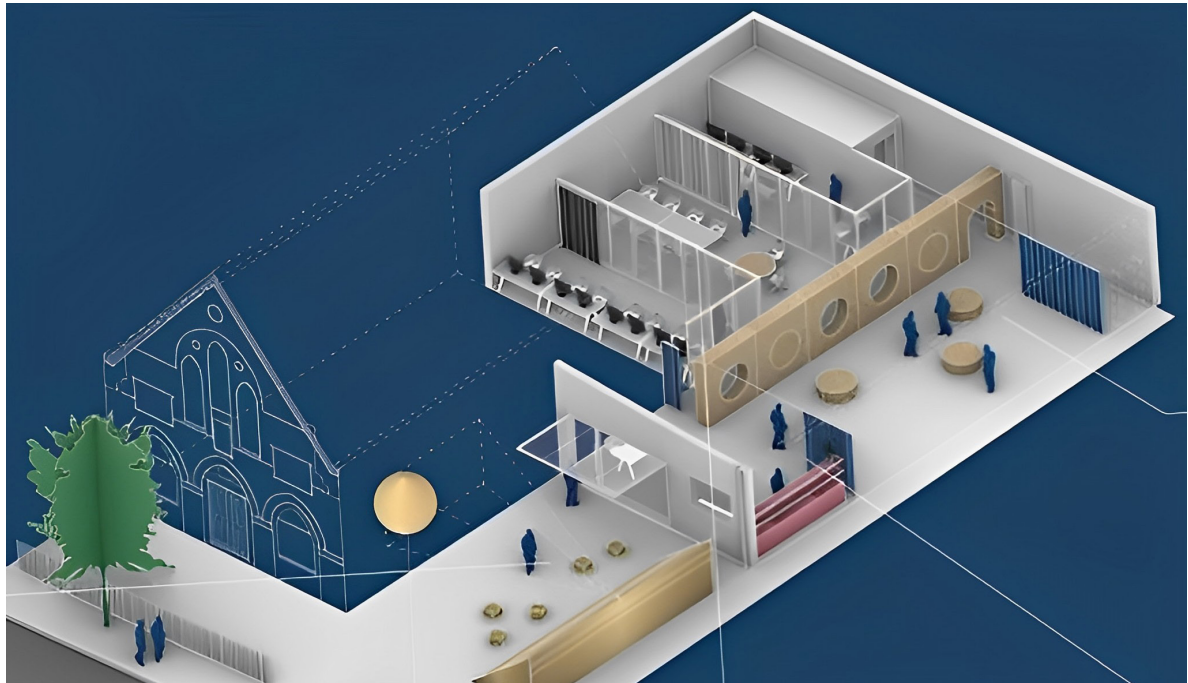
Duration: 19-12-2022 to 31-12-2022

Abstract:

In the post covid period, the need and demand of the school and higher education from learner point of view has drastically changed and requires a more flexible and sustainable way of learning that will incorporate the thinking, emotional and learning elements for holistic development of learner's potentials. The areas that were most compromised were their conscious thinking, emotional need to settle with conflict, stress management, anxiety, thinking and learning competencies, self-awareness, and sustainable emotion practices. To address the gap, the need is having a space that allows to think and express freely. Also, the need to present the learners and individuals with fluid spaces that will help to achieve clarity of thought, creative thoughts, emotion settle etc is important. The outcomes of the project shall be concretised in the form of plan/model of thinking room and more specifically in the form of thinking wall, meditation space including music, templates for anxiety, stress, directing thought, emotion handling, TEDx videos, motivational short videos, thinking journal and so on and forth.

Learning Objective:

- The project will help in directing thought processes of a learner/individual, direct emotion towards productive lifestyle, release thoughts (required/not required) for clarity, design safe thinking spaces, design a model for thinking room and to create thinking wall.



Pedagogy:

- Discussions, hands on experience for designing templates for learning and thinking, developing templates, prepare modules



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Duration: 19-12-2022 to 26-12-2022

Abstract:

Transportation is essential for any nation's development and growth by facilitating trade, commerce, and social interaction, while consuming a considerable portion of time and resources. Highly increasing vehicle population results in transportation problems, and thus it leads to the requirement of more efficient transportation systems. Indian urban road traffic consists of different types of vehicles with different sizes, speed, and manoeuvrability moving on the same right of way without lane discipline and without obeying general traffic rules. They create chaos on junctions and result in enormous delays, more fuel consumption, air and noise pollution, accidents, and also restrict the movement of emergency vehicles. Therefore, it is necessary to quantify the travel time delay in existing traffic conditions. The aim of this study is to quantify the delay in travel time and to identify its causes. It is proposed to measure the travel time delay and to ascertain the notable factors which result in these delays.

Learning Objective:

- The purpose of this Study is to evaluate the quality of traffic movement along a route and determine the locations, types, and extent of traffic delays by using a moving test vehicle. To increase level of service on the study section. This will help to reduce traffic congestion and travel time delay at inter-sections. To introduce fundamental knowledge of traffic engineering so that students can understand and be able to deal with traffic issues including safety, smooth operation and control. Students will also learn about Roadway capacity and role of geometric design in Traffic.



Pedagogy:

- Number of surveys will be performed in this study like, Traffic study: calculation of traffic at selected stretch by Videography or manual method;
- Speed study: Speed observation using speed gun or car flowing method; Delay study: Travel time delay analysis by floating car method; Observation sheet; Analysis of Data collected to find cause of problem; Remedial measures based on analysis.



Priyanka Kanhare, Assistant Professor, School of Environmental Design and Architecture

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Duration: 23-12-2022 to 31-12-2022

Abstract:

Biodiversity in cities exposes people to nature and thereby facilitates an appreciation of nature. This course will serve as a bridge between design and nature. Through interactive class sessions, field trips, and hands-on exercises, students will begin to appreciate the presence of rich biodiversity in urban areas and the beneficial roles natural ecosystems play in cities. This course will broaden their understanding of urban biodiversity, methods for protecting and enhancing it, and introduce them to the concept of an urban green mosaic. At the end of this course, students will design a map, identify biodiversity hotspots, and engage with city dwellers. The course aims to sensitise students and urban dwellers to urban biodiversity. The biodiversity map will depict ecologically significant areas in Vadodara city as well as the dominant flora and fauna species that live there. It will also include chronological maps that explain how the ecology of the city's native habitats has changed over time.

Learning Objective:

- Visualizations of biodiversity that convey natural patterns and processes (such as maps, storyboards, and visual tales);
- Learn and practise qualitative and quantitative mapping skills, during which they will investigate methodologies and procedures for mapping both quantitative data and qualitative (intangible) characteristics of the current landscape.
- Offer hints about potential outcomes and environmentally friendly initiatives: raise the biodiversity quotient (by writing a blog or narrative).



Pedagogy:

- Interactive session informing students about urban biodiversity, safeguarding aspects, and sustainability (2–3 sessions) (Theory): The course will begin with interactive sessions with a focus on informing the students about the importance of biodiversity mapping and a few basic rules to keep in mind when mapping it. These will be presentations. During these sessions, I will also have an interactive session with a focus on the importance of mapping, observing patterns in nature, and ways to sustain biodiversity while taking a campus tour.
- Field work and Base Data Collection: Field work, during which students under my guidance will locate prominent flora and fauna species observed on campus with reference to a Google map. During these visits, students will gather the necessary information and map the observed patterns, as well as complete the necessary documentation for the final map.
- Making of the Biodiversity Map: With reference to data collected during field work, selected students along with faculty will be digitising and graphically developing an artistic and aesthetically pleasing Biodiversity Map, which will be ready for printing. This map depicts ecologically significant areas in Vadodara City, as well as the dominant flora and fauna species that live there. It will also include chronological cartographies that explain how the ecology of the city's native habitats has changed over time.



Dr. Pallavi Ghalsasi, Associate Professor, School of Engineering and Technology
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Duration: 17-12-2022 to 31-12-2022

Abstract:

In India, around 33% people lose their life every year due to lightning striking on them. This percentage is as significant as compared to the deaths caused by other natural calamities like cyclone, earthquake etc. This KHOJ project is intended to collect a comprehensive data of deaths/injuries caused by lightning in and around Vadodara, using lightning detection sensor (LDS) installed at NUV. The data will then be analyzed using popular GIS software. The results will be communicated to Corporation/Gram Panchayat for taking further action in near future. The project also aims towards creating social awareness about the methods for life protection from lightning

Learning Objective:

- To collect data about lightning strikes, casualties/injuries and related damage by doing detailed survey.
- To analyse the data using a popular GIS software and prepare detailed geographical maps of affected areas.
- To communicate the results and analysis to the Government body.
- To help Government body to make action plan to install sufficient lightning arrestors and related procedures
- To conduct awareness program for the community residing in the sensitive areas.



Pedagogy:

- Thorough survey using local newspapers, magazines and personal visits to the places nearby Vadodra.
- Collection of data on lightning incidences
- Discussions
- Analysis of data using GIS software
- Draw conclusions with the help of feedback from NRSC.
- Preparation of the detailed report
- Communication of the report to the concerned Government authority
- Take guidance from NRSC on mitigation steps from lightning strikes
- Plan and conduct awareness program with the community



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