Report on

2 days' workshop on "Field Based Internship under Unnat Maharashtra Abhiyan (UMA)",

Organized by Department of Electrical Engineering, Vidya Pratishthan's Kamalnayan Bajaj Institute of Engineering and Technology, Baramati in collaboration with IITB-UMA

Date of Workshop	11th & 12th July 2025
Coordinator	Mr. Shivaji K. Raskar
Co-Coordinator	Mr. Hafiz Shaikh & Ms. Pallavi Bokey
No. of Participants	82 (Civil+Electrical)
Supported By	IIC, IIIC, IEEE cell VPKBIET

Aim of Workshop:

This aims to promote community-centric, problem-based learning through hands-on field exposure. It will emphasize practical aspects and real-world challenges in areas such as:

- Rural Water Supply Systems
- GIS-Based Mapping and Analysis for irrigation and village internal road network.

- LT/HT Distribution System Management
- Smart Irrigation Techniques

List of the experts:

Subject Expert:
1) Dr. Gopal Chavan, Project Manager, UMA Cell, IIT Bombay
2) Mr. Vivek Shinde, Project Engineer, UMA Cell, IIT Bombay
3) Ms. Bhagyashri Patil, Project Engineer, UMA Cell, IIT Bombay
4) Mr. Tejas Nagotkar, Project Scientist, UMA Cell, IIT Bombay

Panel Expert:
1) Mr. Pradip Jagtap, Sub-Divisional Engineer, Maharashtra Jivan Pradhikaran, Baramati.
2) Mr. Shekhar Balaso Nikam, Assistant Engineer Quality Control, Baramati Rural Subdivision, MSDCEL, Baramati.
3) Mr. Santosh Pise- Agriculture Officer, Krishi Bhavan, Baramati.

July 11, Day 1:

Day 1 started with inauguration ceremony. Mr. Vansh Kuratkar and Ms. Ashwini Joshi introduces the guests. Mr. Shivaji Raskar Introduces objectives of workshop and its importance in the design of syllabus structure for the subject Community project which is newly added syllabus in the engineering SY and TY syllabus After that Hon Principal, Dr. S. B. Lande Sir guided about NEP structure and Community project.

Session 1: Motivation: Higher Education, Development Challenges, and the Role of Academic Institutions by Dr. Gopal Chavan:

The presentation titled *"Higher Education, Development Challenges, and the Role of Academic Institutions"* by Dr. Gopal Chavan (IITB-UMA) explores the critical disconnect between academic institutions and real-world rural developmental issues in Maharashtra. It highlights how government schemes in areas like drinking water, rural transport, and agriculture often fail due to poor monitoring, lack of data, and absence of community-centric analysis. The presentation introduces the **Unnat Maharashtra Abhiyan (UMA)** as a response to bridge this gap by engaging engineering students and faculty in practical problem-solving at the grassroots level. UMA encourages institutions to reimagine their role—not just as centers for knowledge but as contributors to developmental processes through consultancy-like student projects, field-based internships, and research directly tied to local needs.

Through the UMA initiative, the presentation details several active programs and collaborations with departments like Water Resources, Rural Development, and Energy. Projects like *Aapale Prashna Aapale Vidnyan (APAV)* and partnerships with Zilla Parishads have enabled students to undertake field studies on issues like road conditions, irrigation practices, water use efficiency, and rural infrastructure. Students are trained in tools such as GIS and case study methodology to document and analyze these problems. Moreover, internships aligned with NEP 2020 provide students with hands-on exposure, while simultaneously generating valuable knowledge products for government agencies. This

model creates a triple benefit: skill-building for students, better policy data for administrators, and increased social relevance for academic institutions.

The presentation further outlines how institutions can institutionalize such initiatives by creating Field Study Cells, development clubs, and integrating problem-based learning in curricula. Colleges are encouraged to formalize collaboration with state agencies via MoUs, align academic content with local issues (like electricity distribution, canal irrigation, sanitation), and use existing government frameworks and funding (like GRs) to support such work. Successful examples, such as the GIS mapping of village roads in Ratnagiri and water user association audits, demonstrate the potential of this model. Overall, the presentation advocates a transformation of higher education into a community-embedded ecosystem where learning, service, and regional development go hand in hand.

Session II – Panel Discussion on "Community Project for Engineering Students"

The second session of the workshop featured an engaging and insightful panel discussion on the theme "Community Project for Engineering Students**"**, coordinated by Mr. Rohit Tarade, Assistant Professor, Electrical Engineering. The panel comprised key stakeholders from academia, government departments, and industry: Mr. Ravindra Patil (Dean, IIIC), Mr. Gaurav Gadge (HOD, EED), Mr. Pradip Jagtap (Sub-Divisional Engineer, Maharashtra Jivan Pradhikaran), Mr. Shekhar Balaso Nikam (Assistant Engineer, Quality Control, MSEDCL Baramati), Mr. Santosh Pise (Agriculture Officer, Krishi Bhavan), and Dr. Gopal Chavan (Project Manager, UMA Cell, IIT Bombay). Each expert contributed to the discussion by highlighting the scope and challenges of involving engineering students in real-world community projects.

Mr. Ravindra Patil initiated the session by focusing on the importance of wastewater management and the public health concerns arising from improper disposal of wastewater. He emphasized the need for sustainable engineering solutions in rural areas to mitigate diseases caused by contaminated water. Following this, Mr. Pradip Jagtap elaborated on several government schemes under the Maharashtra Jivan Pradhikaran, particularly in the context of wastewater and potable water projects. He explained how engineering students could play a vital role in third-party inspections, performance audits, and design improvements during internships or community projects. However, he also pointed out the structural limitations and bureaucratic boundaries that sometimes restrict student engagement.

Mr. Santosh Pise brought in the agricultural perspective, presenting various agriculture-related schemes and datasets that are underutilized but highly valuable for engineering analysis. He encouraged students to explore agricultural machinery development as a promising area for innovation and interdisciplinary projects. Mr. Shekhar Nikam then detailed the scope for electrical engineering students within MSEDCL, including projects related to network stability, harmonics analysis, and digital energy meters. He stressed the importance of localized studies to address rural electrification challenges. During the session, Mr. Rohit Tarade posed thought-provoking questions, including the feasibility of mini-hydropower projects, which sparked further discussion with Mr. Jagtap. The session concluded with a thoughtful summary and closing remarks by Dr. Gopal Chavan, who reiterated the value of community-based learning and encouraged continued collaboration between academia and local development agencies.

Session III: Theory and introduction of GIS By Mr. Vivek Shinde:

The presentation titled *"Introduction to GIS"* by the Mr. Vivek Shinde provides a foundational understanding of Geographic Information Systems and their critical role in decision-making across various sectors. It defines GIS as a system for creating and analyzing geospatial data through tools like satellites, drones, and community mapping. The presentation highlights GIS applications in agriculture, infrastructure, disaster management, and utility planning. It emphasizes the necessity of GIS in government departments, enabling them to efficiently manage data related to rural roads, groundwater resources, cropping patterns, and electrical infrastructure. The types of geospatial data—vector and raster—are introduced, along with the concepts of coordinate reference systems and GIS layers, which allow for layered spatial analysis of features like roads and village boundaries.

The second part of the presentation offers a hands-on overview of GIS software, particularly the use of QGIS, an open-source platform. Key functionalities such as project creation, layer management, digitization, styling, labeling, and geoprocessing tools (like union, buffer, intersection, etc.) are explained. A detailed walkthrough of the GIS interface is provided, including the map canvas, toolbars, browser panel, and status bar. Tools such as the field calculator are introduced for performing spatial and attribute operations on selected features. The presentation also compares open-source GIS software (e.g., QGIS, GRASS GIS) with commercial options like ArcGIS and MapInfo. Overall, the session aims to equip participants with practical knowledge of spatial data handling, making GIS a valuable asset for planning, monitoring, and executing development projects effectively.

Session 4: Use of GIS softwares for Field-based Courses and Hands On Training

Mr Tejas Nagotkar use of various softwares for interdisciplinary studies and for field based courses. Prof Jyoti enquired about sources of the data, accessibility and few other points. He highlighted the usefulness of these softwares and expressed the need for making transformer data public for students to study and use for their projects. He further proposed that the students may map this infrastructure on their own using these softwares. To this, Mr Tejas informed the participants about MSEDCL circular on mapping the transformer (and other energy infrastructure) using ITI / diploma students (and fresh graduates). He also shared that there is provision of (nominal) honorarium for these students on a pro rata basis.

12 July, Day 2:

Session 1 & 2, Open DSS, Advance QGIS By Tejas Nagotkar:

Mr Tejas Nagotkar made a presentation on OpenDSS software and explained its use cases for electrical engineering projects. Many faculty members expressed their interest to explore OpenDSS software and some opined that this could be a good alternative for MATPOWER.

Session 3 Project Discussion and Field Visit:

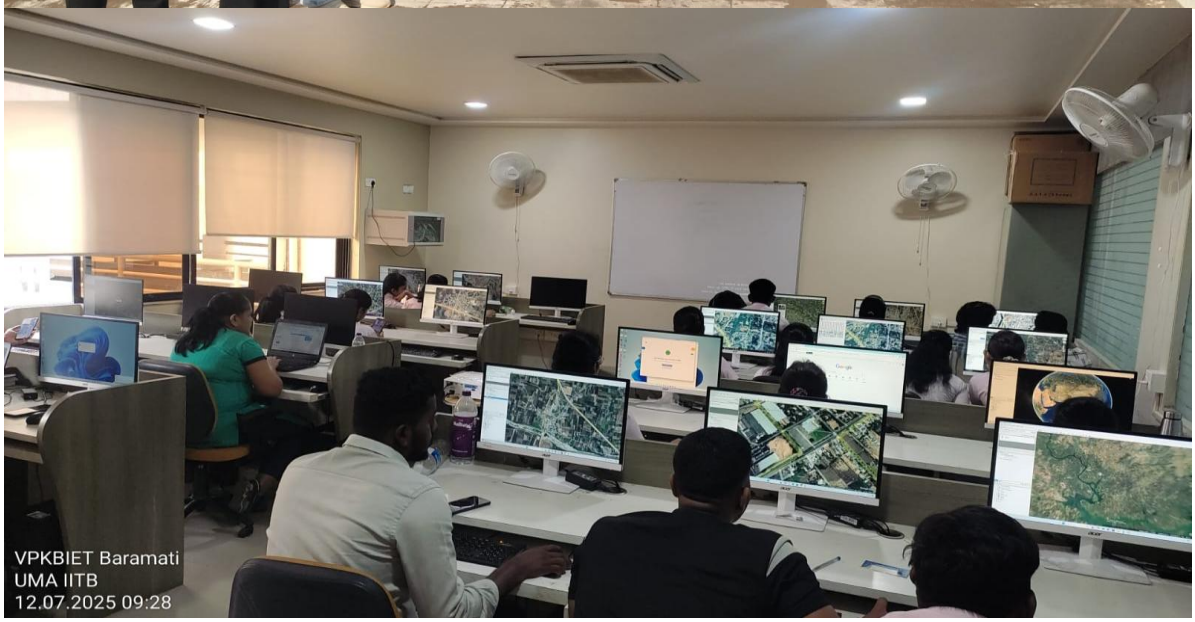
Projects:

1) Spatially Enabled Load Flow Analysis and Voltage Profiling of a Rural Agricultural Feeder using QGIS and OpenDSS

2) Reactive Power Compensation through Optimal Capacitor Placement using QGIS and OpenDSS
3) Geospatial Fault Analysis and Supply Restoration Planning using QGIS and OpenDSS
4) Optimization of Distribution Transformer Placement using QGIS Spatial Tools and OpenDSS Simulation
5) Spatially Enabled Load Flow Analysis and Voltage Profiling of a Urban Industrial Feeder using QGIS and OpenDSS

Fied Visit and Valedictory Function: Field visit was conducted to the VPKBIET Solar rooftop Power plant for future BE project development followed by valedictory function. All civil and electrical Projects was discussed with students and Civil, Electrical faculties. Vote of thanks given by Dr, Gaurav Gadge, HOD, EED.

Some Photographs:


VPKBIET Baramati
UMA IITB
12.07.2025 09:28

Mr. Shivaji Raskar **Dr. Gaurav Gadge**

Coordinator **HOD, EE**