BUNIYAAD

a technical magazine by

Department Of Civil Engineering

Ambalika Institute of Management & Technology, Lucknow

JANUARY-2024

The Institute was established in 2008 as a private engineering and management college in (Mohanlalganj) Lucknow, Uttar Pradesh India and is affiliated to AKTU and BTE and Approved by AICTE. The Lucknow campus is spread over vast 200 acres and is located near NH-56B, surrounded by lush green field and enhanced by a beautiful lake. The institute is 24 kilometers from Lucknow Railway Station and 20 kilometers from CCS Airport, Lucknow. It is very well connected to the district headquarters.

Ambalika center of excellence has become the most dominating center delivering high-end technical skills to our engineers to make them highly employable. AIMT, Lucknow is imparting training and joint certification programs of innovative technologies in collaboration with the Industry giants such as Microsoft, KUKA Robotics, Siemens, Ace Micromatics, MTab, and Master CAM etc.

Departmental vision

To create high quality civil engineers with knowledge par excellence who may contribute in nation building with highest moral and ethical values as true citizens of a civilized society.

Departmental mission

- To adapt teaching and learning process that gives student power to think and to analyze
- To impart practical knowledge by means of lab exposure and industrial interaction
- To conduct co-curricular activities for updation of technological advancement
- To impart moral and ethical values by means of various programs

Head of the Department

SURYAKANT SHUKLA

M.Tech (Civil Engineering)
B.Tech (Civil Engineering)

I am very pleased that we have successfully published the "January-2024" edition of our departmental magazine "BUNIYAAD". The technical magazine is a combined effort the students, faculty members and the magazine team. It gives a overview of the major projects taken up in the department. The Magazine article gives an insight of various aspects of Civil Engineering. This Magazine has served as a platform to students and member of the faculties to present their unique ideas. The Magazine is a sincere effort to bridge the gap between theoretical knowledge and practical application of Civil Engineering.

I would like to congratulate the editorial team and the members of faculty for working together as a team in publishing this Magazine. I hope the Magazine re-energizes the perspective of Civil Engineering and the Magazine is a Success.

CONTENTS

STUDENT'S SPACE

Earthquake resistant design of RC Buildings

Earthquake-resistant construction, the fabrication of a building or structure that is able to withstand the sudden ground shaking that is characteristic of earthquakes, thereby minimizing structural damage and human deaths and injuries. Suitable construction methods are required to ensure that proper design objectives for earthquake-resistance are met. Construction methods can vary dramatically throughout the world, so one must be aware of local construction methods and resource availability before concluding whether a particular earthquake-resistant design will be practical and realistic for the region.

There is a fundamental distinction between the design of a building and the construction methods used to fabricate that building. Advanced designs intended to withstand earthquakes are effective only if proper construction methods are used in the site selection, foundation, structural members, and connection joints. Earthquake-resistant designs typically incorporate ductility (the ability of a building to bend, sway, and deform without collapsing) within the

structure and its structural members. A ductile building is able to bend and flex when exposed to the horizontal or vertical shear forces of an earthquake. Concrete buildings, which are normally brittle (relatively easy to break), can be made ductile by adding steel reinforcement. In buildings constructed with steel-reinforced concrete, both the steel and the concrete must be precisely manufactured to achieve the desired ductile behaviour.

Building failures during earthquakes often are due to poor construction methods or inadequate materials. In less-developed countries, concrete often is not properly mixed, consolidated, or cured to achieve its intended compressive strength, so buildings are thus extremely susceptible to failure under seismic loading. This problem is often made worse by a lack of local building codes or an absence of inspection and quality control.

Ravi Pratap Singh

CE 4th year

Design of a plant for treatment of waste water

Wastewater is the water which has been released to the environment that is defined as a combination of the water plus wastes that have been added to the water from a variety of uses, such as industrial, commercial, residences and there are two sources which release the wastewater into the environment. First, sewage/community wastewater is the kind which has been expelled from domestic premises such as institutions, residence etc. and commercial establishments which are organic because of the consistency of carbon composites alike vegetables, human waste, paper etc. Second, is the wastewater that has been produced by industrial procedures which is also organic in composition (Zhou, H. 2002). These pollutions can be dangerous for human body and environment so wastewater should be treated in order to prevent these damages to take place, the process which purifies the wastewater in order to discharge it back into a watercourse is known as wastewater treatment. Wastewater treatment uses chemical, physical, and biological processes to cleanse wastewater in order to protect the environment and public health. Wastewater treatment happens in some

infra structures which are called wastewater treatment plant (Hammer, 1986). Generally a wastewater treatment plant consists of Mechanical treatment, Biological treatment and Sludge treatment sections. There are different kinds of pollutants and wastes in the wastewater such as, nutrients, inorganic salts, pathogens, coarse solids etc., which are very dangerous for ecology and human. In order to remove these pollutants different processes have been exposed. There are specific processes and unit operations in wastewater treatment which are chemical, physical or biological. All these processes should be considered before deigning a proper wastewater treatment plant which depends on the characteristics of the wastewater. In this text a wastewater treatment plant will be designed related to the characteristics of the wastewater.

Deepanshu Pandey

CE 4th year

Durability study of concrete using foundry waste sand

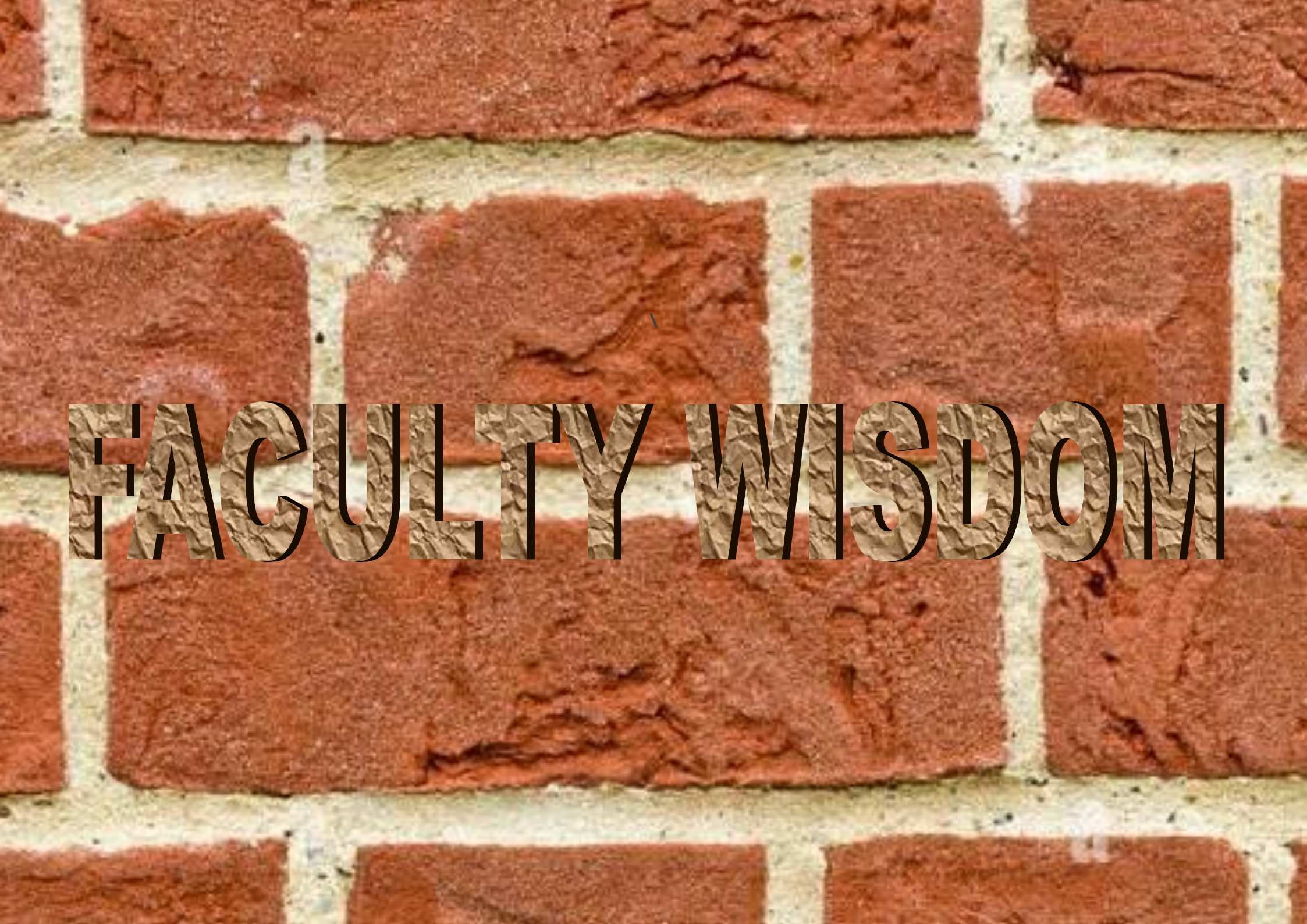
The industrial through merchandise which have been disposed in the past are now being regarded for really useful use. Beneficial use can limit our nation's carbon manufacturing and consumption of virgin material and result in financial gains. It is essential issue of nation's solid waste administration hierarchy that first promotes supply reduction and waste prevention followed via reuse, recycling, electricity restoration and disposal. Researches all over the world nowadays are focusing on ways of utilizing either industrial or agricultural wastes as a supply of raw materials for the industry. These wastes utilization would not solely be economical, however may additionally also result to foreign change earnings and environmental pollution control. The utilization of industrial and agricultural waste produced by means of industrial procedure has been the focus of waste discount research for economical, environmental and technical reasons. This is due to the fact over 300 million tons of industrial wastes are being produced per annual via agricultural and industrial process in India. The hassle arising from non-stop technological and industrial development is the

disposal of waste material. If some of the waste substances are determined appropriate in concrete making not only value of development can be cut down, but also protected disposal of waste cloth can be achieved. The cement of excessive energy concrete is usually high which regularly leads to higher shrinkage and larger contrast of neat of hydration except extend in cost.

Aditya Raj Sharma

Shivam Kumar Pal

CE 4th year


FACULTY WISDOM

Satellite Rainfall Estimation

Prashant Mishra
M.TECH (Remote Sensing)
B.Tech (CIVIL ENGINEERING)

Being an important component of the hydrological cycle, there is a great need for accurate estimation of the rainfall. Although the rain gauge networks can estimate the rainfall with a good accuracy but they are non-uniformly and are sparsely distributed. Therefore it was required to estimate the rainfall on a spatially uniform and closer network, without leaving even the inaccessible points (Mishra et al., 2010). This was possible only by the satellite rainfall estimation. Using advanced remote sensing tools and techniques as satellite rainfall estimation would provide reliable and timely data to supplement the gauge stations and fill in the data gaps to forecast floods with greater accuracy.

Satellite rainfall estimations are primarily done with the help of two types of meteorological satellites, geostationary satellites and polar orbiting satellites. The orbits of geostationary satellites are such that they rotate at the same speed as the earth and hence appear to be stationary relative to any point on the Earth. Geostationary satellites provide continuous observation of the earth's surface and provide data on a half hourly basis. Imagery obtained from these satellites is mainly visible (VIS) and infrared (IR) at resolution of about 4 km, with information on clouds collected once every half an hour (Kidd et al., 2009). Though a

continuous coverage is provided by these satellites they are said to be limited by their range and resolution of the imagery. There are several operational geostationary meteorological satellites in orbit such as the MTSAT, GOES, Mateosat, FY series, and INSAT.

The second types of satellites are the polar orbiting satellites. Polar-orbiting satellites travel in a circular orbit from pole to pole orbiting at an altitude of about 800 km and use MW (Microwave) channels. The orbits of these satellites are such that they pass the equator at the same local time on every orbit, providing about two overpasses each day. These satellites carry a range of instruments such as MW sounders and imagers that are capable of more direct measurement of precipitation.

The polar orbiting satellites include the NOAA-17 and 18, DMSP-F13, 16, 17, FY-1D, and METOP-A operated by various operational agencies.

The satellite rainfall estimation techniques can be divided in three wide groups:

- **Visible/Thermal Infrared Estimation**

This is usually done by the sensors, which are mounted on geostationary satellites. The visible (VIS) and infrared (IR) sensors uses cloud top temperatures which are indirect measurements but provides rapid temporal update cycle with a continuous temporal coverage every half an hour needed to capture the growth and decay of precipitating clouds.

- **MW Estimation**

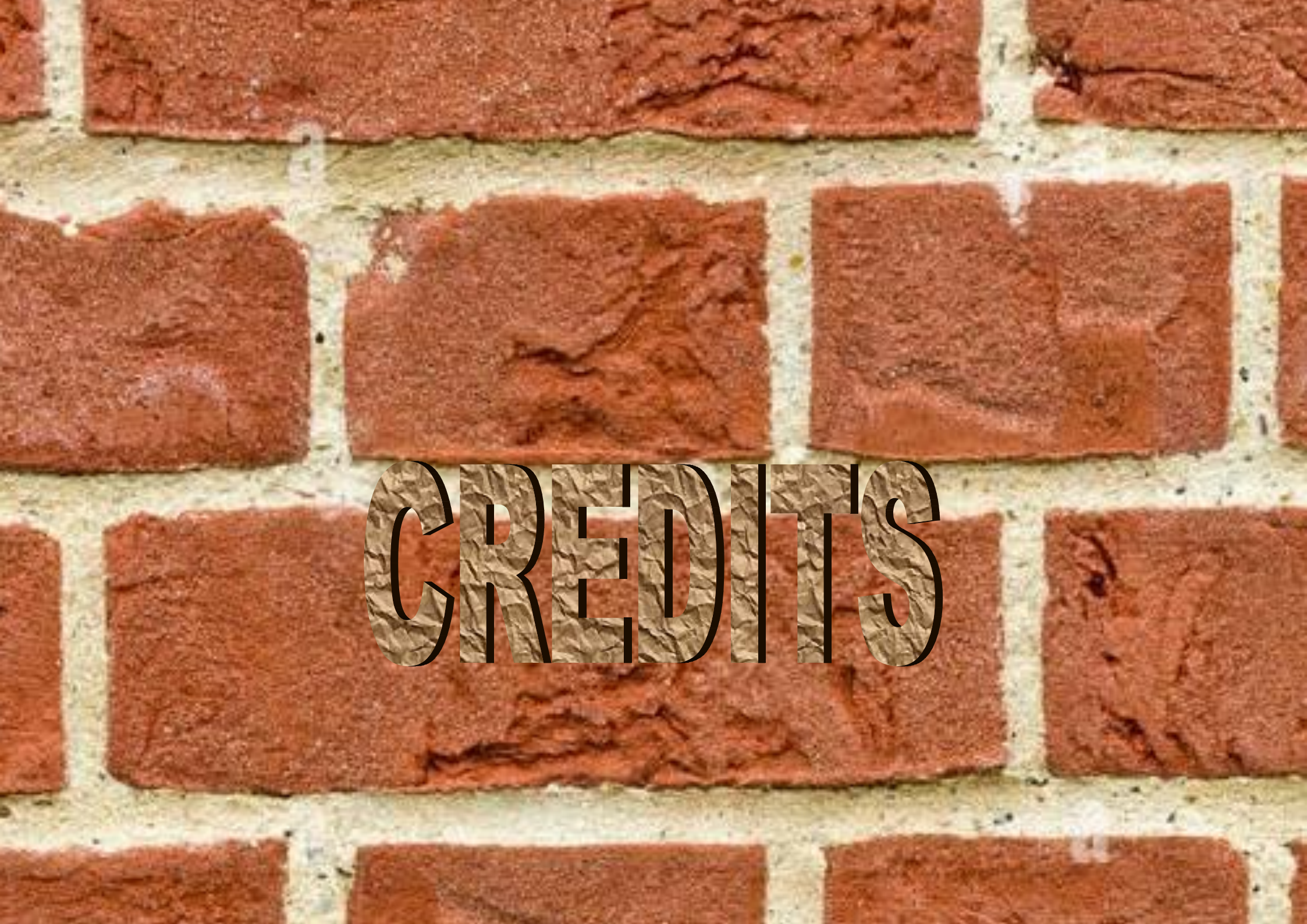
MW estimation is considered better because MW can penetrate through the clouds and give us the information about the vertical profile of the clouds. The drawback associated with MW estimation technique is that MW sensor can-not be mounted on geostationary satellite owing to lower energy in MW band.

Therefore it's mounted on low orbiting satellites and its temporal frequency is lesser as compared to VIS and IR sensors mounted on geostationary satellites. However MW estimation very accurate.

- **Multispectral Rainfall estimations**

The TIR sensors do not have the ability to detect signal from the variable vertical cloud profile. The MW sensors have the ability to detect the variable vertical profile as they can penetrate through the clouds. On the other hand MW sensors do not have good temporal resolutions as they are mounted on low orbiting satellites, because of low energy in the MW band. Thus both of MW as well as TIR sensors have their shortcomings and strengths .The complementary strengths of MW and TIR are combined to produce rainfall estimation data products. Techniques to generate merged products of high resolution precipitation estimates are relatively new and evolved rapidly in recent years (Xie et al., 2007). As each of the techniques based on IR and MW sensors described above have their strengths and limitations, techniques in combining these satellite data have been developed to improve accuracy, coverage and resolution for better rainfall estimates (Huffman et al., 2007).

Prashant Mishra
Assistant Prof.
Department of CE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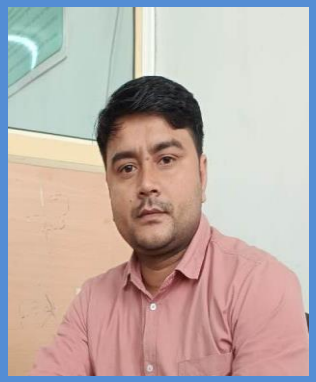
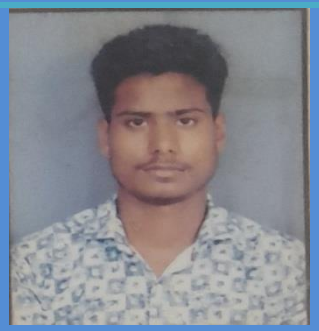
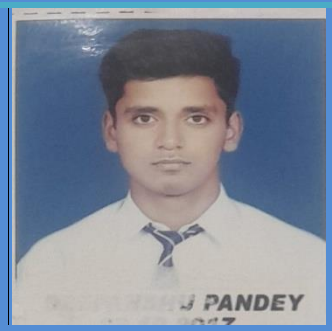
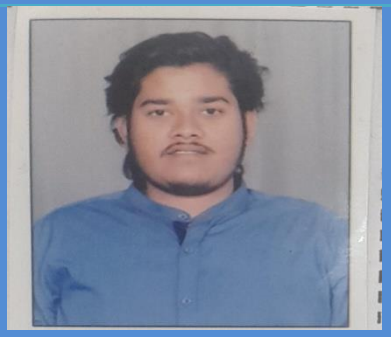
Suryakant Shukla Asst. Prof. Dept. of CE		Prashant Mishra Asst. Prof. Dept. of CE	
Ravi Pratap Singh B.Tech CE-4th Year		Deepanshu Pandey B.Tech CE-4th Year	
Aditya Raj Sharma B.Tech CE-4th Year		Shivam Kumar Pal B.Tech CE-4th Year	

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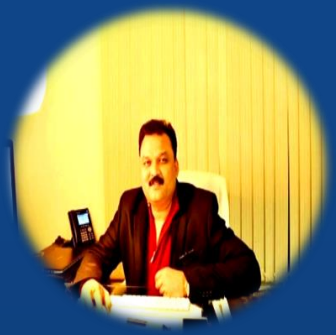

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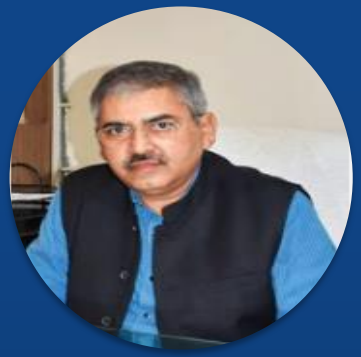

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