

Department of Electronics

SSESA's Science College, Congress Nagar, Nagpur

Regional Meteorological Center, Nagpur (RMC)

Study Tour – Report

Date: 31.01.2024

On Wednesday 31/01/2024 we had an industrial visit at RMC (Regional Meteorological Center) located near Babasaheb Ambedkar Airport, Nagpur. It is the principle agency responsible for meteorological observation and weather forecasting. Our guide for the day was Avinash Tarodekar who guided us and explained us everything regarding department, instruments, their working and much more which is helpful to us.

Our trip started with the instrumentation of Single Stevenson Screen which consist of concave mirror and provides shelter for meteorological instruments particularly wet and dry thermometers. This instrument is commonly used for measuring the temperature while Double Stevenson Screen is used for measuring humidity.





Then we were given information regarding Ordinary Rain Guage which basically records daily or weekly rainfall. After that we were shown the interesting instrument called the Open Pan Evaporimeter used for measuring the rate of water evaporation from wet surface to atmosphere.



At the weather department only we got to know that there is a digital sensor which actually shows changes in weather according to the direction. Last but not the least sir gave us information about the Sun Shine Recorder which records hours of bright sunshine.





Latitude: 21.088791
 Longitude: 79.055244
 Elevation: 146.03±3 m
 Accuracy: 15.6 m
 Time: 31-01-2024 13:07

Powered by NoteCam

These were the few instruments shown to us during our trip. All these are used in meteorology, science, agriculture, tourism and other fields. This one day trip at RMC was helpful, valuable and worth experiencing.

Data Logger: Heart of AWS

Data logger features

- ❖ Digital and analog channels
- ❖ Quality control mechanism.
- ❖ Provision to modify measurement schedules and sampling interval.

SENSORS

Parameter	Type	Height	Accuracy	Range & Resolution
Air temperature	Thermistor / Pt-100	2 m	± 0.2 °C	-40 °C to +60 °C Resolution: 0.1 °C
Relative humidity	Capacitive type	2 m	± 3%	0% to 100% Resolution: 1%
Atmospheric pressure	Accubar solid state	1.5 m	0.2 hPa	600-1100 hPa (100 hPa above datum value) Resolution: 0.1 hPa Resolution: 0.5 mm
Rainfall	Tipping Bucket	0.6 to 1 m	2% at 240 mm/hr	0-60 m/s Resolution: 0.1 m/s
Wind speed	Ultrasonic	10 m	1.2 m/s	0-360 Resolution: 1 0.3-4 µm
Wind direction	Ultrasonic	10 m	1°	
Global solar radiation	Silicon photo-diode Licor-220	2 m	5% against Eppley lab	
Soil temperature	Campbell Scientific	-20 cm	± 0.4 °C	-40 °C to +50 °C Resolution 0.1°C
Soil moisture	Stevens Hydra Probe	-20 cm		

WIND SONIC SENSOR

PRINCIPLE OF OPERATION OF WIND SONIC SENSOR

The Wind Sonic measures the times taken for an ultrasonic pulse of sound to travel from the North transducer to the South transducer, and compares it with the time for a pulse to travel from S to N transducer. Likewise times are compared between West and East, and E and W transducer. If, for example, a North wind is blowing, then the time taken for the pulse to travel from N to S will be faster than from S to N, whereas the W to E, and E to W times will be the same. The wind speed and direction can then be calculated from the differences in the times of flight on each axis. This calculation is independent of factors such as temperature.

Accubar Pressure Sensor

The 5600-0120 ACCUBAR Pressure Sensor is a solid-state pressure transducer suitable for data collection and monitoring applications. The ACCUBAR sensor has been designed with the following features to operate in a wide range of applications.

Principle of Operation of a Solid State Strain Gauge Transducer.

Wheatstone Bridge
 ❖ A source of Electrical Potential (Battery)
 ❖ Galvanometer Resistors

PRINCIPLE OF OPERATION OF Accubar Pressure Sensor

Pressure Transducer with Diaphragm
 Force per unit area is sensed by the movement of the diaphragm. Relationship between the pressure and the movement of the diaphragm is governed by the stiffness of the diaphragm.
 As pressure is applied to the diaphragm, the wires increase in length and decrease in diameter, increasing the resistance to flow of current through the wires of the Wheatstone Bridge.
 This change in the wire electrical resistance gives a voltage output that is proportional to the change in the diaphragm's position that occurs in response to the change in pressure.



Students and Staff Members of Electronics Department visited Regional Meteorological Centre (RMC), Nagpur on 31.01.2024

रडार/आई. एस./ आर.एस.आर.डब्ल्यू/आर.डब्ल्यू.एफ.सी

यह सूचित किया जाता है कि सक्षम अधिकारी ने Shivaji Science College, नागपुर के B. Sc. 2nd year and B. Sc. 3rd year Electronics के लगभग 50 छात्रों एवं 2-3 प्राध्यापकों को प्रादेशिक मौसम केंद्र, नागपुर में दि. 31/01/2024 के दिन दौरा करने हेतु मंजूरी दी गई है। सभी अनुभाग अधिकारी अपने अनुभाग के कार्यप्रणालियों की विस्तृत जानकारी छात्रों को दें। दौरा कार्यक्रम निम्न सारणी के आधार पर रहेगा:

क्र. सं	युनिट	समयावधि
1.	वेधशाला / आर.एस.आर.डब्ल्यू (IS/RSRW)	10:30 बजे से 13:00 बजे तक (Observation and instruments)
2.	आर.डब्ल्यू.एफ.सी (RWFC)	14:00 बजे से 15:30 बजे तक (General idea about forecast, weather changes and other queries by the students) Followed by a Group Photograph
3.	रडार (RADAR)	16:00 बजे से 17:30 बजे तक (General idea about Doppler Weather Radar)

अपूर्वा

अपूर्वा सिंहरोल
मौसम विज्ञानी-ए
कृते प्रमुख

प्रतिलिपि:

1. Dr. J. K. Keche, Coordinator, Dept. of Electronics, Shivaji Science College, नागपुर (ई-मेल द्वारा)
2. मौ. वि. "बी" (प्रशासन), प्रा.मौ.के. नागपुर, सूचना हेतु
3. एक्स.ए.ई., प्रा.मौ.के. नागपुर, सूचना हेतु



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Shri Harshvardhan P. Deshmukh
President

Prof. M. P. Dhore
Principal

- 'A+' Grade with 3.51 CGPA (3rd Cycle) Reassessment College by NAAC, Bangalore
- A College with Potential for Excellence identified by UGC, New Delhi
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- Recognized Centre for Higher Learning & Research
- Mentor College under 'Paramarsh Scheme' UGC, New Delhi



**Dr. Panjabrao alias
Bhausaheb Deshmukh**
Founder President

Date: 23.01.2024

To,
The Head,
(Deputy Director General of Meterology)
Regional Meterological Center,
India Meterological Department,
Beside Dr. Babaseheb International Airport, Nagpur.
Contact No.: 0712-2282157

Subject: Permission to visit Regional Meterological Center, India Meterological Department

Respect Sir,

On behalf of Shri Shivaji Science College, Congress Nagar, Nagpur where I serve as the Co-ordinator of Electronics Department, I wish to request for permission to conduct an Industrial visit at your Meterological Department on Wednesday 31/01/2024 at 11:00am to acquire some practical knowledge.

A group of B.Sc. 2nd year and B.Sc. 3rd year Electronics students (max. 50) and two-three faculty members intend to participate in this industrial visit.

Please allow us to visit your Department and meet your skilled employees. Please feel free to contact with us on the given contact number if there are other requirements for the visit.

Thank You.

Yours faithfully,

(Dr. J. K. Keche, Coordinator, Dept. of Electronics)

Contact No.: 9850325524

Staff Members:

1. Mrs. Pragati A. Bire
2. Ms. Raksha R. Pali
3. Mrs. Sonali A. Sagdeo