



S.G.A.GOVERNMENT DEGREE COLLEGE

(Re-accredited by NAAC with 'A' Grade, Affiliated to Andhra University)

YELLAMANCHILI - 531055, ANDHRA PRADESH



DEPARTMENT OF PHYSICS

**REPORT OF FIELDTRIP TO “HERITAGE DAIRY”
BAYYAVARAM TO KNOW WORKING AND PROCESSING OF
DAIRY PRODUCTS.**

61 Students accompanied by two lecturers dated: 16-06-2017

1. Sri P Srimannarayana, Lecturer in Physics

2. Sri Md Rafiuddin, Lecturer in Physics

List of students involved in a fieldtrip

S.No	Name of the student	Registered no	Class
1	719135405001	B. Leelavathi	I-B.Sc (MPC)
2	719135405002	B. Chinnari	I-B.Sc (MPC)
3	719135405003	D. Satyadurga	I-B.Sc (MPC)
4	719135405004	D. Vasu	I-B.Sc (MPC)
5	719135405005	G. Ganesh	I-B.Sc (MPC)
6	719135405006	G. Sirisha rani	I-B.Sc (MPC)
7	719135405007	G. Hari babu	I-B.Sc (MPC)
8	719135405008	K. Mahesh	I-B.Sc (MPC)
9	719135405009	K. Appalaraju	I-B.Sc (MPC)
10	719135405010	K. Chinnari	I-B.Sc (MPC)
11	719135405011	K. Prasadu	I-B.Sc (MPC)



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12	719135405012	K. Poornasai	I-B.Sc (MPC)
13	719135405013	K. Anitha	I-B.Sc (MPC)
14	719135405014	K.S.S. shanker	I-B.Sc (MPC)
15	719135405015	K. Karthik	I-B.Sc (MPC)
16	719135405016	K. Visalakshi	I-B.Sc (MPC)
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21	719135405022	N.Nookesh	I-B.Sc (MPC)
22	719135405023	N. Anuradha	I-B.Sc (MPC)
23	719135405024	N.D. Dhanalakshmi	I-B.Sc (MPC)
24	719135405047	A.Siva sravani	I-B.Sc (MPCs)
25	719135405050	B.Sai leela	I-B.Sc (MPCs)
26	719135405051	B.Srinivasa rao	I-B.Sc (MPCs)
27	719135405055	K.Sirisha	I-B.Sc (MPCs)
28	719135405056	K.Anusha	I-B.Sc (MPCs)
29	719135405058	K.Geeta	I-B.Sc (MPCs)
30	719135405061	M.Venkateswarlu	I-B.Sc (MPCs)
31	718135405045	A.Sravani	II-B.Sc (MPCs)
32	718135405047	Ch.Anil kumar	II-B.Sc (MPCs)
33	718135405049	G.Raju	II-B.Sc (MPCs)
34	718135405054	K.Durga	II-B.Sc (MPCs)



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35	718135405055	K.Ravi kumar	II-B.Sc (MPCs)
36	718135405057	K. Nikhila	II-B.Sc (MPCs)
37	718135405058	M. Rama krishna	II-B.Sc (MPCs)
38	718135405062	N. Siva prasad	II-B.Sc (MPCs)
39	718135405064	P. Govind	II-B.Sc (MPCs)
40	718135405065	P. Supriya	II-B.Sc (MPCs)
41	718135405069	T. Chaitanya	II-B.Sc (MPCs)
42	718135405021	K.R.D. Kumari	II-B.Sc (MPC)
43	718135405022	K. Sravanthi	II-B.Sc (MPC)
44	718135405023	K. Hari	II-B.Sc (MPC)
45	718135405024	K. Srinivas	II-B.Sc (MPC)
46	718135405025	M. Anjali	II-B.Sc (MPC)
47	718135405026	M. Govind rao	II-B.Sc (MPC)
48	718135405027	M. Yamuna	II-B.Sc (MPC)
49	718135405028	M. Bharati	II-B.Sc (MPC)
50	718135405029	M. Parsasuram	II-B.Sc (MPC)
51	718135405030	N. Nagamani	II-B.Sc (MPC)
52	718135405031	N. Jhanasi	II-B.Sc (MPC)
53	718135405032	N. Satya	II-B.Sc (MPC)
54	718135405033	P. Sowjanya	II-B.Sc (MPC)
55	718135405034	P. Koti	II-B.Sc (MPC)
56	718135405035	P. Varalakshmi	II-B.Sc (MPC)
57	718135405036	P. Neeraja	II-B.Sc (MPC)



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58	718135405037	R. Saikumar	II-B.Sc (MPC)
59	718135405038	S. Suresh kumar	II-B.Sc (MPC)
60	718135405039	S. Venkatesh	II-B.Sc (MPC)
61	718135405040	S. Neelima	II-B.Sc (MPC)

Working and processing of a dairy Products in adairy

Aim of the field trip :

To study the pasteurization, Homogenization, centrifugal separation, ultra filtration, Reverse osmosis, ultra osmosis, spray dying etc...techniques.

Various processes involved in a milk dairy

How milk is made depends on a number of different technologies - all designed to make the process more efficient.

Milk is collected from either cows or buffaloes. The milk is sent through stainless steel pipes to large refrigerated vats and then stored at 5°C or less. Within 48 hours, milk is taken in tankers to a milk factory where it is pasteurized and homogenized.

Pasteurization

This technique heats milk to 72°C for no less than 15 seconds, then cooled immediately to destroy any harmful bacteria and micro-organisms. This also extends the shelf life.

Homogenization

Milk is put under pressure through fine nozzles, which evenly disperses fat globules. This stops the cream separating and rising to the top, allowing a more consistent texture and taste. Some manufacturers produce unhomogenised milk for people who prefer the cream to separate and rise to the top of the bottle.

Today's farm technology, cattle management and factory methods allow for greater consistency of milk, and milk composition can be adjusted for year-round consistency. Milk composition is standardized so elements like fat content are made consistent no matter the season or breed of cow the milk comes from.

Centrifugal separation



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This removes some or all of the cream to make reduced-fat, low-fat or skim milk. Skim milk solids can be added back to improve the test and texture, and increase nutrients like protein and calcium.

Ultra filtration

This moves milk across a membrane under moderate pressure, which holds back protein, fat globules, and a large amount of calcium complexes.

Water and lactose (the sugar in milk) pass through, leaving behind a very protein and calcium-rich product. The fat content can be adjusted to suit consumer preference.

Reverse osmosis

This is very similar to ultra filtration, but the membrane holds back most of the milk solids and only lets water pass through. Lactose remains in the product. There is no impact on flavor.

Ultra osmosis

This is a combination of ultra filtration and reverse osmosis, but it holds back milk solids and allows both water and salt to pass through.

Spray drying

This removes water from milk in order to make powdered milk products. Milk's nutritional value remains the same.

Permeate

In order to standardize milk year-round, some manufacturers use a process called ultra filtration where a membrane filter separates certain elements from milk (just like in the descriptions above). Milk is passed through a very fine filter, and the lactose (milk sugar), vitamins and minerals that filter through are referred to as "permeate".

Permeate is a technical term which applies to all membrane filtration processes used across food production and other industries. For example, when producing apple juice the fruit is put through a similar filtration process where permeate is the clear juice we end up buying and consuming.

In milk processing, the word "permeate" does not refer to anything added which was not already part of milk. That filter helps milk producers make milk with consistent properties.



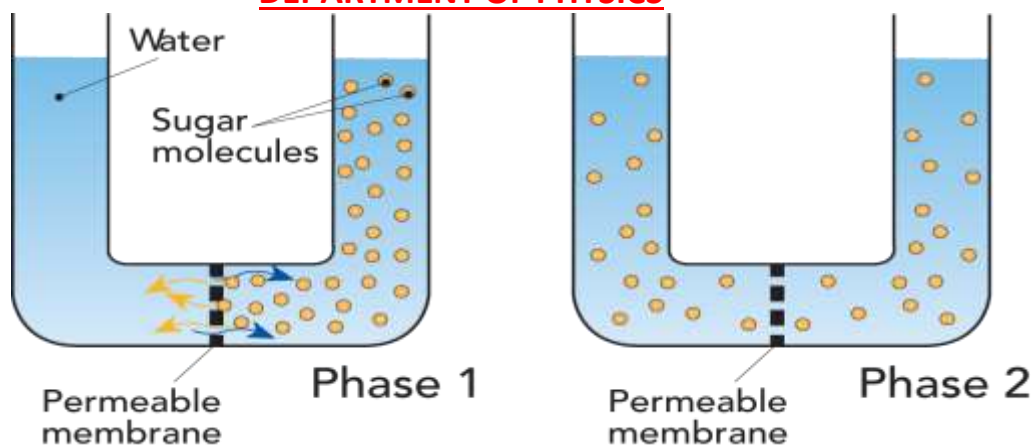
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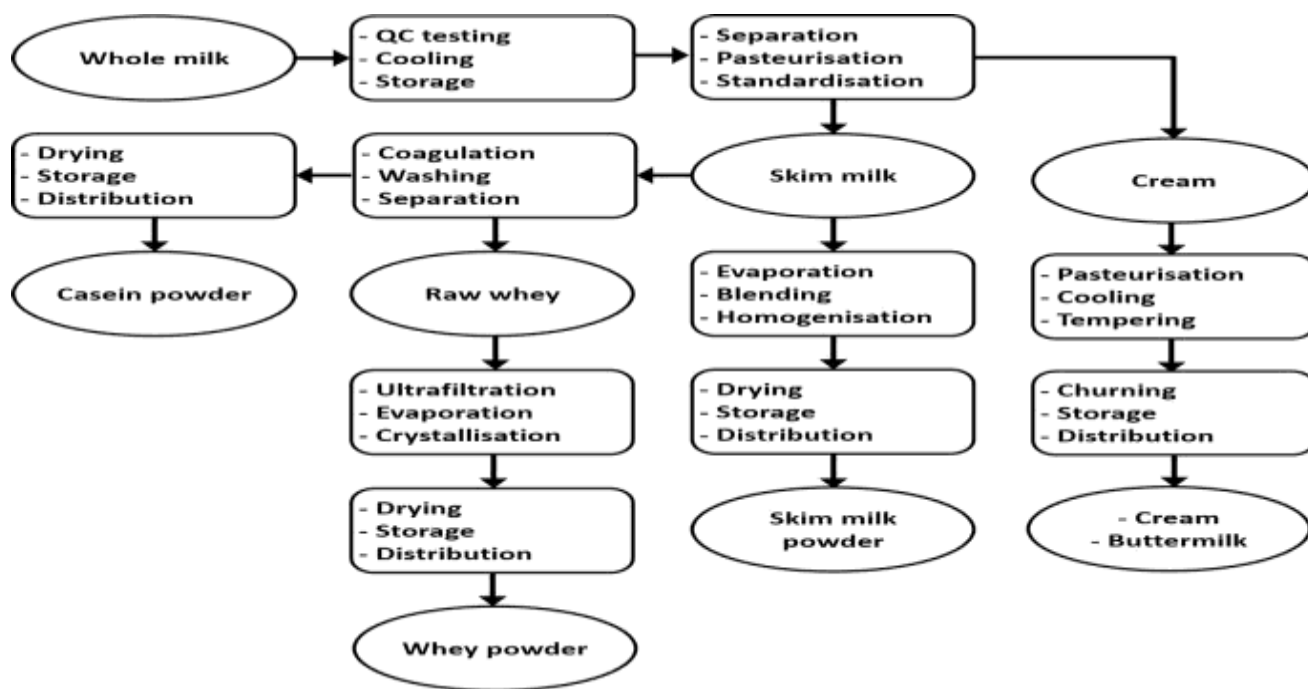
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DEPARTMENT OF PHYSICS



The sugar molecules diffuse through the permeable membrane and the water molecules diffuse in the opposite direction in order to equalize the concentration of the solution.



Outcome of the Field trip:

By this field trip we learnt about various steps involved in the milk processing in a milk dairy and got exposure to working of various instruments in the milk dairy. Gained knowledge about various by-products of milk.



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Sri P.Sreemanarayana , lecturer in physics and Md Rafiuddin, Lecturer in physics accompanied the students about 40 members to field trip to the Heritage dairy at Bayyavaram , kasimkota mandal dated : 16-06-2017

Sri P. Rafiuddin
Lecturer in Physics
SGA GDC
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Department of Physics

**REPORT OF FIELDTRIP TO “CYCLONE WARNING CENTER”
VISAKHAPATNAM TO KNOW WORKING OF VARIOUS
METROLOGICAL INSTRUMENTS**

74 Students accompanied by two lecturers dated:19-12-2019

1. Sri B. Nageswara Rao, Lecturer in Physics

List of students involved in a fieldtrip

S.No	Name of the student	Registered No	Class
1	717135405001	A.MOUNIKA RANI	III-B.Sc (MPC)
2	717135405003	A.SWETHA	III-B.Sc (MPC)
3	717135405004	A.JHANSI	III-B.Sc (MPC)
4	717135405005	B.MADHU	III-B.Sc (MPC)
5	717135405007	B. CHINNARI	III-B.Sc (MPC)
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16	717135405030	P. RAJU	III-B.Sc (MPC)
17	717135405031	P. TULASI	III-B.Sc (MPC)
18	717135405032	P. RAJESH	III-B.Sc (MPC)
19	717135405035	P. MANGA	III-B.Sc (MPC)
20	717135405036	R. S. NARAYANA	III-B.Sc (MPC)
21	717135405037	S. NOORJAHAN	III-B.Sc (MPC)
22	717135405038	S. JOHN	III-B.Sc (MPC)
23	717135405039	T. GANGA RAJU	III-B.Sc (MPC)
25	717135405040	V.KALYANI	III-B.Sc (MPC)
26	717135405042	V.KUMAR	III-B.Sc (MPC)
27	717135405043	Y. KUMARI	III-B.Sc (MPC)
28	717135405045	B. NOOKARATNAM	III-B.Sc (MPCs)
29	717135405046	CH. SAI KRISHNA	III-B.Sc (MPCs)
30	717135405047	CH. SREE LEKHA	III-B.Sc (MPCs)
31	717135405048	E. ANAND	III-B.Sc (MPCs)
32	717135405049	G. SANDHYA	III-B.Sc (MPCs)
33	717135405050	K. K. KUMARI	III-B.Sc (MPCs)
34	717135405051	K. DIVYA	III-B.Sc (MPCs)
35	717135405052	L. BHAVANI	III-B.Sc (MPCs)
36	717135405053	M. SIVANI	III-B.Sc (MPCs)
37	717135405055	N. JYOTHI	III-B.Sc (MPCs)



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41	717135405059	P. PAVAN	III-B.Sc (MPCs)
42	717135405060	S. VANAJA	III-B.Sc (MPCs)
43	717135405061	S. MOHAN	III-B.Sc (MPCs)
44	718135405001	A.YASODHA LAKSHMI	II-B.Sc (MPC)
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46	718135405004	B. HEMA LATHA	II-B.Sc (MPC)
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60	718135405025	M. ANJALI	II-B.Sc (MPC)
61	718135405028	M. BHARATHI	II-B.Sc (MPC)
62	718135405030	N. NAGA MANI	II-B.Sc (MPC)
63	718135405031	N. JHANSI	II-B.Sc (MPC)
64	718135405032	N. SATHYA	II-B.Sc (MPC)
65	718135405033	P. SOWJANYA	II-B.Sc (MPC)
66	718135405034	P. KOTI	II-B.Sc (MPC)
67	718135405035	P. VARA KAKSHMI	II-B.Sc (MPC)
68	718135405036	P. NEERAJA	II-B.Sc (MPC)
69	718135405037	R. SAI KUMAR	II-B.Sc (MPC)
70	718135405038	S.S. KUMAR	II-B.Sc (MPC)
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73	718135405049	G. RAJU	II-B.Sc (MPCs)
74	718135405054	K. DURGA	II-B.Sc (MPCs)

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Metrological instruments in a cyclone warning centre

AIM:

To get knowledge of various equipment in cyclone warning center such as rain guage, thermo meter, Barometer, Anemometer, Sun shine recorder, hygrometer , lightening detector etc...

DESCRIPTION:

We are the batch of 74 members visited the cyclone warning center and observed the following instruments and understand the working principle of each instrument and their uses

Daily Temperature thermometers



Thermometers measure the high and low outdoor temperatures in degrees Fahrenheit and degrees Celsius. Meteorologists first used liquid-in-glass thermometers in the late 1800s, but they now use electronic maximum-minimum temperature sensor systems more frequently. The newer systems use an electronic temperature sensor to measure and record high and low temperatures.



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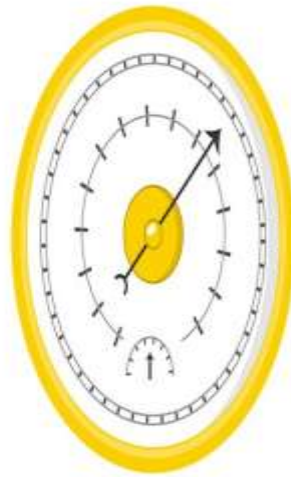
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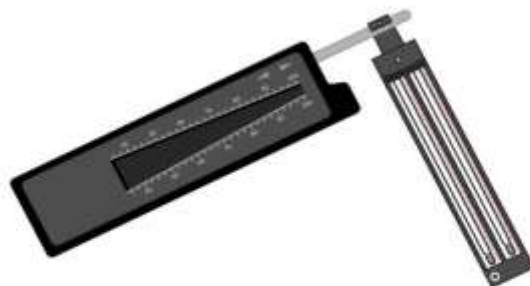
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Atmospheric Pressure measuring Barometers



Barometers measure atmospheric pressure, providing the measurement in millibars. Under most conditions, high and rising pressure indicates sunny weather, while low and falling pressure indicates approaching rain. The traditional aneroid barometer first appeared in the 1840s. The microbarograph also measures air pressure but records its continuous measurements on paper.

Humidity Sensors





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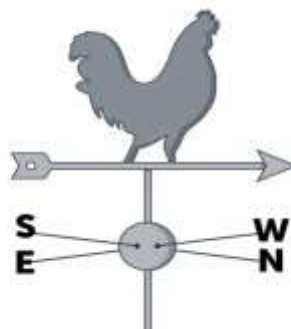
Hygrometers measure temperature and humidity using degrees Celsius and degrees Fahrenheit. One type of hygrometer, called a sling psychrometer, uses one dry and one wet bulb thermometer to measure the relative humidity of the air. Some older hygrometers used a sheaf of hair, which increases in length as relative humidity increases.

Wind Speed



Anemometers measure the direction and speed of wind in miles per hour. A common type of anemometer has three cups fixed to a mobile shaft. As the wind blows faster, the cups spin around faster. The actual speed of the wind shows up on a dial. Another type of anemometer uses a propeller instead of cups to accomplish the same function.

Wind Vane





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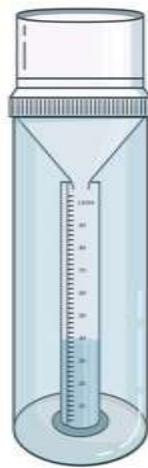
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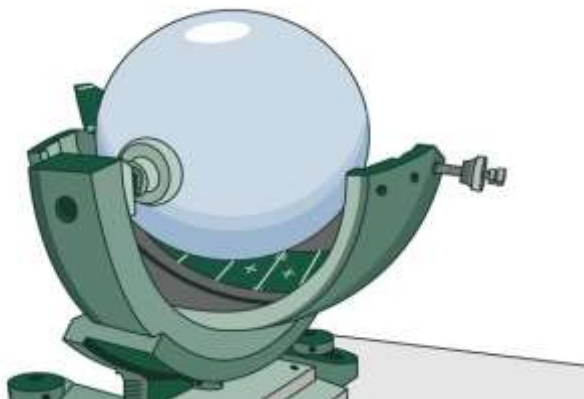
A wind vane, also called a wind sock, measures the direction of the wind at any given point in time. A weighted arrow spins around a fixed shaft and points north, south, east or west, typically marked on separate fixed shafts parallel to the arrow.

Rain Gauge



A rain gauge measures the amount of rainfall. The standard rain gauge consists of a long, narrow cylinder capable of measuring rainfall up to 8 inches. Many rain gauges measure precipitation in milli-meters, or to the nearest 100th of an inch. Other gauges collect the rain and weigh it, later converting this measurement into inches.

Campbell Stokes Recorder





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The Campbell Stokes Recorder measures sunshine. Sunlight shines into one side of a glass ball and leaves through the opposite side in a concentrated ray. This ray of light burns a mark onto a thick piece of card. The extensiveness of the burn mark indicates how many hours the sun shone during that day.

Lightening detector:

The lightning detector system uses a radio that listens for lightning at 500 kHz, it listens for a particular radio signal pattern. The lightning signal pattern is generated by the electrical “spark”, that is the lightning itself. The lightning detector system can be susceptible to detecting erroneous lightning strikes. The same signal “spark” can be artificially generated by many different man-made sources. Such sources could be radio towers, power plants, garage door motors, the ignition system on a car, starting an electrical motor, flipping a light switch, and more.

The system does utilize filters to isolate and reduce as many errors as possible, but some “erroneous” signals will still get through. If the filter system is made to be more robust and more discriminating, it will also be less sensitive to lightning and may not pick up the small distance strikes.

The lightning detector system will not provide a perfect count of actual lightning strikes with perfect distance estimates. In most cases, the system will be rather accurate, but there will always be a few discrepancies.

Outcome of the field-trip:

Observed the various instruments and got knowledge about the various instruments. Studied in detail about Rain-guage, thermo-meter, Baro-meter, Anemo-meter, Sun shine recorder, hygrometer, lightening detector etc...



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Department of Physics



Field trip at cyclone warning Centre, Visakhapatnam guided by sri B Nageswara Rao, Lecturer in Physics dated: 16-12-2019.

Sri. Rafiuddin
Lecturer in Physics
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Department of Physics

**REPORT OF FIELDTRIP TO “CYCLONE WARNING CENTER”
AND “SUBMARINE INS KURUSURA” VISAKHAPATNAM TO
KNOW WORKING OF VARIOUS METROLOGICAL
INSTRUMENTS AND WORKING OF SUBMARINE.**

88 Students accompanied by two lecturers dated

1.Sri P S Jaggarao, Lecturer in Physics

2. Sri K Venkanna, Lecturer in Physics

List of students involved in a fieldtrip

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19	719135405019	M. Kantham	III-B.Sc (MPC)
20	719135405021	M. Sujatha	III-B.Sc (MPC)
21	719135405022	N. Nookesh	III-B.Sc (MPC)
22	719135405023	N. Anuradha	III-B.Sc (MPC)



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25	719135405026	P. Madhavi	III-B.Sc (MPC)
26	719135405027	P. Pavani	III-B.Sc (MPC)
27	719135405028	P. Madhava	III-B.Sc (MPC)
28	719135405029	P. Narasinga rao	III-B.Sc (MPC)
29	719135405030	P. Gangabhavani	III-B.Sc (MPC)
30	719135405031	P. Priyanka	III-B.Sc (MPC)
31	719135405032	S. Vijay lakshmi	III-B.Sc (MPC)
32	719135405033	S. Laxmi devi	III-B.Sc (MPC)
33	719135405034	S. Swetha rani	III-B.Sc (MPC)
34	719135405035	S.L. Shankara Rao	III-B.Sc (MPC)
35	719135405036	S. Manju Sree	III-B.Sc (MPC)
36	719135405037	T. Saikumari	III-B.Sc (MPC)
37	719135405038	U. Chitti joythi	III-B.Sc (MPC)
38	719135405039	V. Kasi rao	III-B.Sc (MPC)
39	719135405040	V. Rajesh	III-B.Sc (MPC)
40	719135405041	V. Prasad	III-B.Sc (MPC)
41	719135405042	V. Tataji	III-B.Sc (MPC)
42	719135405043	Y. Tataji	III-B.Sc (MPC)
43	719135405044	Y. Laya	III-B.Sc (MPC)
44	719135405045	Y. Latha	III-B.Sc (MPC)
45	719135405046	Y. Appalaraju	III-B.Sc (MPC)
46	719135405049	A. Lahari aswini	III-B.Sc (MPCs)
47	719135405050	B. Sai leela	III-B.Sc (MPCs)
48	719135405051	B. Srinivasrao	III-B.Sc (MPCs)
49	719135405052	G. Bhagya Lakshmi	III-B.Sc (MPCs)
50	719135405055	K. Sirisha	III-B.Sc (MPCs)
51	719135405056	K. Anusha	III-B.Sc (MPCs)
52	719135405057	K. Anuradha	III-B.Sc (MPCs)
53	719135405060	M. Suryakala	III-B.Sc (MPCs)
54	719135405061	M. Venkateswarlu	III-B.Sc (MPCs)
55	719135405062	M. Sai manikanta	III-B.Sc (MPCs)
56	719135405064	O. Dhana lakshmi	III-B.Sc (MPCs)
57	719135405065	P. Pavani	III-B.Sc (MPCs)
58	719135405067	T. Lavanya	III-B.Sc (MPCs)
59	719135405068	T. Aruna	III-B.Sc (MPCs)
60	719135405069	U. Dhanush	III-B.Sc (MPCs)
61	719135405070	V. Bhanupriya	III-B.Sc (MPCs)
62	719135405071	V. Pavan kumar	III-B.Sc (MPCs)



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64	720135405002	A. Naga pushpa	II-B.Sc (MPC)
65	720135405003	B. Balasubramanyam	II-B.Sc (MPC)
66	720135405004	B. Sivalakshmi	II-B.Sc (MPC)
67	720135405005	B. Bharathi	II-B.Sc (MPC)
68	720135405009	K. Shirisha	II-B.Sc (MPC)
69	720135405010	K.B.N. Bhuvanvshwari	II-B.Sc (MPC)
70	720135405011	K. Deepika	II-B.Sc (MPC)
71	720135405012	K. Pavani tejasri	II-B.Sc (MPC)
72	720135405013	M. Sravanthi	II-B.Sc (MPC)
73	720135405014	M. Raju	II-B.Sc (MPC)
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81	720135405025	S. Leelavathi	II-B.Sc (MPC)
82	720135405026	S. Umadevi	II-B.Sc (MPC)
83	720135405027	S. Gayathri	II-B.Sc (MPC)
84	720135405035	B. Balaji	II-B.Sc (MPCs)
85	720135405048	M. Vasundhara	II-B.Sc (MPCs)
86	720135405052	M. Sandeep	II-B.Sc (MPCs)
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Department of Physics

Field Trip 2021-22

Study of Metrological instruments in a cyclone warning centre

AIM:

To get knowledge of various equipment in cyclone warning center such as rain gauge, thermometer, Barometer, Anemometer, Sun shine recorder, evaporation pan, Radio sonde etc...

DESCRIPTION:

We are the batch of 88 members visited the cyclone warning center and observed the following instruments and understand the working principle of each instrument and their uses



Rain guage





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The bottom segment of this instrument is placed firmly into the ground. Rainfall is collected in a bottle inside of the instrument. The bucket ensures retention of rainfall for measurement as it facilitates for overflow of the bottle in heavy downpours.

This instrument should not be situated near tall buildings and trees since these obstruct the rain collection.

Mercury Barometer



A glass tube with lower end dipped in mercury. Mercury fills tube except for a few inches at the top where a vacuum exists. A very sensitive instrument.

Reading a Mercury Thermometer

The attached thermometer is read.

A vernier scale is set - making it at the same level as the mercury.

The reading is taken at the top of the mercury.

Corrections are made to the reading



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Aneroid Barograph



Movement of arm depends on the response to variations in atmospheric pressure. The disc-shaped boxes bulge outward when pressure falls, and corresponding markings are made on the graph.

Hand-held Anemometer



Portable instrument for instantaneous wind speed and wind direction measu



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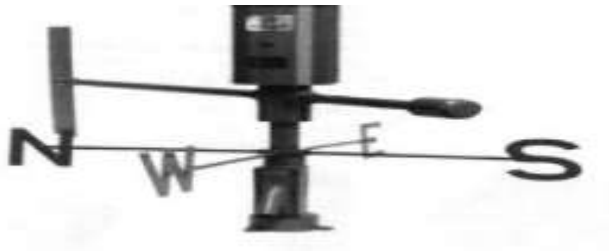
Cup Counter Anemometer



Wind pushes into the cups causing the instrument to spin. The amount of rotations is recorded by the counter on the device. This gives an idea of the wind speed.

Placement of this instrument is critical. It should not be close to buildings or tall obstructions. Tall obstructions cause eddies, turning in the wind around obstacles.

Wind Vane



This device gives the direction from which the wind is blowing.



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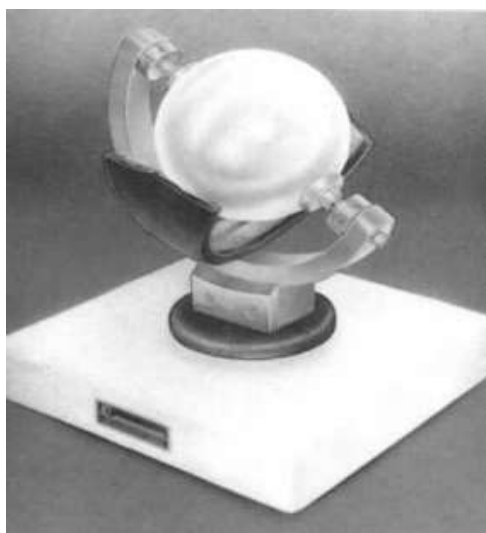
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Sunshine Recorder



A solid glass sphere resting on an adjustable support. The sun's rays are focused by the sphere, thus burning a mark onto a card held inside the bowl.

Three cards are used: summer card (long & curved), winter card (short & curved) and equinoctial card (a straight card). This is because of the apparent movement of the sun.

Evaporation Pan



A pan filled with water to a known depth. The stilling well is placed in the pan and supports the



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hook gauge, which is used to measure the height of the water in the pan.

Over a 24 hour period some water would be added by rainfall and removed by evaporation.

Rainfall is recorded and is thus known. Therefore the volume of water evaporated can be derived

Thermometers



Dry bulb and wet bulb thermometers are supported vertically. The wet bulb thermometer has its bulb wrapped in a muslin and the wick in a reservoir of distilled water. Together, they measure the relative humidity.

The dry bulb thermometer measures the temperature of the atmosphere. The wet bulb thermometer measures the temperature of the atmosphere if the atmosphere is 100% saturated.

Low humidity occurs when the difference between the dry bulb temperature and the wet bulb temperature are far apart.

High humidity occurs when the difference between the dry bulb temperature and the wet bulb temperature are close together.

Maximum and minimum thermometers are supported horizontally and measures the maximum



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(daytime) temperature and minimum (night time) temperature respectively. They must be read at least twice a day. Usually it is done every main hour (8a.m., 2p.m., 8p.m., 2a.m.)

All are mercury-in-bulb thermometers except the minimum thermometer, which is an alcohol-in-bulb thermometer. Care must be taken when reading thermometers to avoid errors due to parallax.

Thermograph



Thermograph consists of a bi-metallic spiral coils and uncoils with changes in temperature. This action causes movement of an attached pen. This is a chart that is changed on a weekly basis.

Hygrograph





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Hygrograph depends on the reaction of human hair to humidity.

The length of the hair increases with increasing relative humidity.

Radiosonde



A radiosonde attached to a weather balloon measures weather conditions higher up in the atmosphere. The radiosonde has sensors that can take readings of meteorological parameters at different levels and layers in the atmosphere and a transmitter then allows this data to be transmitted to a computerized system.

Parameters measured are temperature, dew-point, atmospheric pressure, Geo-potential height, wind speed and direction.

Outcome of the field-trip:

Observed the various instruments and got knowledge about the various instruments. Studied in detail about Rain-guage, thermo-meter, Baro-meter, Anemo-meter, Sun shine recorder, evaporation pan, Radio-sonde.



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WORKING OF INS KURSURA SUBMARINE

Aim of the field trip

To get thorough knowledge of mechanical and electrical components of a submarine and to get exposure on working of each component.

Description of submarine

We the batch of 28 members visited the INS kursura submarine and observe each and every part of it. We are presenting about its history and it consists of following things.

INS *Kursura* (S20) was a diesel-electric submarine of the Indian Navy. She was India's fourth submarine. *Kursura* was commissioned on 18 December 1969 and was decommissioned on 27 February 2001 after 31 years of service. She participated in the Indo-Pakistani War of 1971, where she played a key role in patrol missions. She later participated in naval exercises with other nations and made many goodwill visits to other countries.

After decommissioning, it was preserved as a museum for public access from 24 August 2002 making its final journey to Visakhapatnam on RK Beach. *Kursura* has the distinction of being one of the very few submarine museums to retain originality and has been called a "must-visit destination" of Visakhapatnam. Despite being a decommissioned submarine, she still receives the navy's "Dressing Ship" honour, which is usually awarded only to active ships.

People have always wanted to fly like birds, and eventually we invented airplanes. Similarly, people have wished to swim underwater like fishes, and so we invented submarines. Designs for underwater boats or submarines were developed in the 1500s.

However, it was not until the 1800s that the first useful submarines were made and tested. A submarine (or any boat) can float when the mass of water that it displaces (pushes out of the way) is equal to the mass of the boat. This displaced water causes an upward force called buoyancy. Buoyancy acts in the opposite direction to gravity, which would pull the ship



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down. A regular boat cannot control or change its buoyancy, but a submarine can. This allows a submarine to dive under the water or to come up to the surface.





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To control its buoyancy, the submarine has ballast tanks (see picture) that can be filled with water or filled with air. When the submarine is on the surface, the ballast tanks are filled with air. This makes the submarine's density less than the density of the water. When the submarine dives, water is pumped into the ballast tanks to replace the air. This makes the density of the submarine greater than the density of the water and the submarine sinks. Tanks of compressed air are kept on the submarine and when the crew wants to go back to the surface, they pump air into the ballast tanks to force out the water.



Outcome of the field trip

We have observed mechanical and electrical parts of submarine completely. We are enriched with knowledge of technology and working of submarine.



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Field trip at Cyclone Warning Center, Visakhapatnam guided by sri P S Jaggarao , Lecturer in Physics and sri K Venkanna, Lecturer in Physics dated: 04-04-2022


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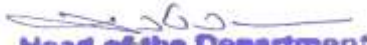
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Field trip at Submarine INS Kursura, Visakhapatnam guided by sri P S Jaggarao , Lecturer in Physics and sri K Venkanna, Lecturer in Physics dated: 04-04-2022.


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