



Program Title: **Energy and Greenhouse Gas Auditing of MSU-IIT Buildings**

Project Leader: **Prof. Hernando P. Bacosa, Ph.D.**

Period Covered: **October 1, 2024 to December 31, 2024 (4<sup>th</sup> Quarter)**

Inclusive Dates: **March 1, 2024 to December 31, 2024**

### **QUARTERLY PROGRESS REPORT (Form 1)**

#### **I. Introduction and Objectives**

The Philippines has shown a high ambition to increase the proportion of renewable energy and enhance its efficiency within the nation's energy mix (Aleluia et al., 2022). The government enacted the Republic Act No. 11285 (Energy Efficiency and Conservation Act) in 2019, aiming to establish energy efficiency and conservation measures, improve the effective utilization of energy, and offer incentives for related projects. Simultaneously, the Department of Energy (DOE) made a National Energy Efficiency and Conservation Plan and Roadmap (2023-2050) which provides an updated outline of the strategic plans and actions for energy efficiency compliance (EEC) in the Philippines across all sectors (Philippine Energy Plan, 2019). In compliant to the Paris Agreement, the country is set to achieve its goals to reduce GHG emissions by 75% by 2030 (Lavasa, 2015). Under AmBisyon Natin 2040, the country is also fixed to achieve economic growth that is relevant, inclusive and sustainable with educational services as one of the priorities. These goals cannot be achieved without the active participation of all sectors particularly the valuable contribution of higher education institutions (HEIs).

The Mindanao State University – Iligan Institute of Technology (MSU-IIT) situated in Northern Mindanao is aligned with the Sustainable Development Goals (SDGs). The



institution is focused on climate change and energy efficiency which aligns with SDGs 7 and 13. As the country is moving towards energy sustainability, the university also aims to have access to affordable, reliable, sustainable, and modern energy. It also correlates in combating climate change and its impacts through mitigation, adaptation, and resilience-building measures. Throughout the past decade, the university has a very high consumption of electricity. High electricity consumption can significantly impact both its financial health and environmental footprint. The increased energy use directly leads to higher operational costs, resulting in elevated utility bills. This financial strain diverts funds from essential areas such as academic programs, research initiatives, and student services. Consequently, the university may face budget constraints, limiting its ability to invest in new technologies, infrastructure upgrades, or additional faculty and staff. Moreover, high electricity consumption has considerable environmental implications. Greater energy use results in higher greenhouse gas emissions, exacerbating climate change. This environmental impact extends beyond the university, affecting the broader community and the planet. By consuming large amounts of electricity, the university also contributes to local air pollution and resource depletion.

Energy audit is one of the first phase to achieve energy efficiency, hence it is globally recognized and validated approach (Lavasa, 2015); Magrini et al., 2016). It is a systematic assessment and evaluation of energy use and efficiency within a building, facility, or industrial process. The primary goal of an energy audit is to identify opportunities for energy savings, reduce energy waste, and improve overall energy performance (Kluczek & Olszewski, 2017).

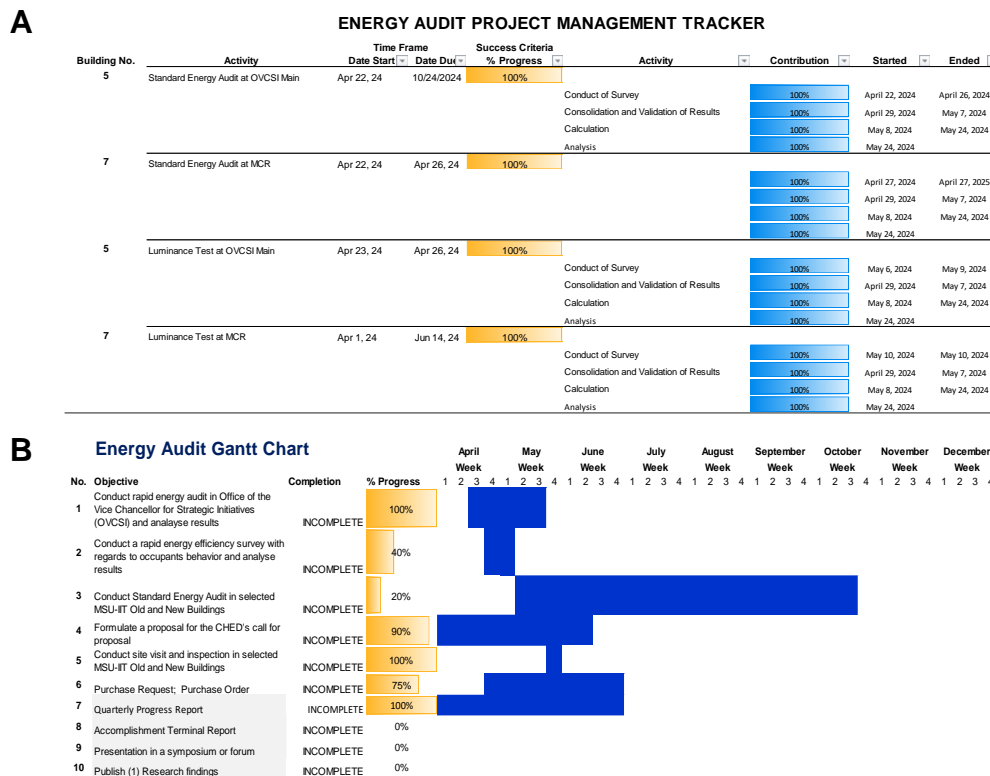


**Significance.** As far as renovations are concerned, energy audit plays a significant role in the campus retrofit with the aim to identify energy usage failures (Krarti, 2020). Energy audit is an adequate practice to optimize energy in industrial sites and buildings while diagnosing the operating problems that could affect an energy-efficient operation (Al Momani et al., 2023). In the view of energy conservation measures, it is crucial to outline the importance of complex solutions (Kluczek & Olszewski, 2017). Namely, upgrades in the university's electrical system or at least adjustments of existing systems to achieve the top performance of retrofitted buildings. In the context of economic development, energy conservation measures can be undertaken with minimum cost.

**Objectives.** Therefore, this study delivers the first phase of standard energy audit procedures in MSU-IIT. Specifically, the objectives are: (1) to conduct a comprehensive diagnostic energy audit at selected buildings of MSU-IIT, (2) to conduct the static illuminance test at selected buildings, and (3) to conduct humidity test on each rooms of the buildings. This study will serve as baseline for a university in the Philippines. To the best of our knowledge, this is also the first-time that a comprehensive diagnostic energy audit will be performed in a university in the country. The results of this study will emphasize balanced solutions on energy and environment, and make use of the best available and economically justified technologies which adheres to major improvement of energy efficiency in an institution.

## II. Materials and Methods

This project's method is effectively implemented using a Project Management Tracker that is currently developing. Fig. 1 depicts an example of the tracker. Meanwhile, this paper's Sections 2.1 and 2.2 to 2.5 corresponds to Project Management and Methods employed, respectively, throughout the energy audit of selected MSU-IIT buildings.

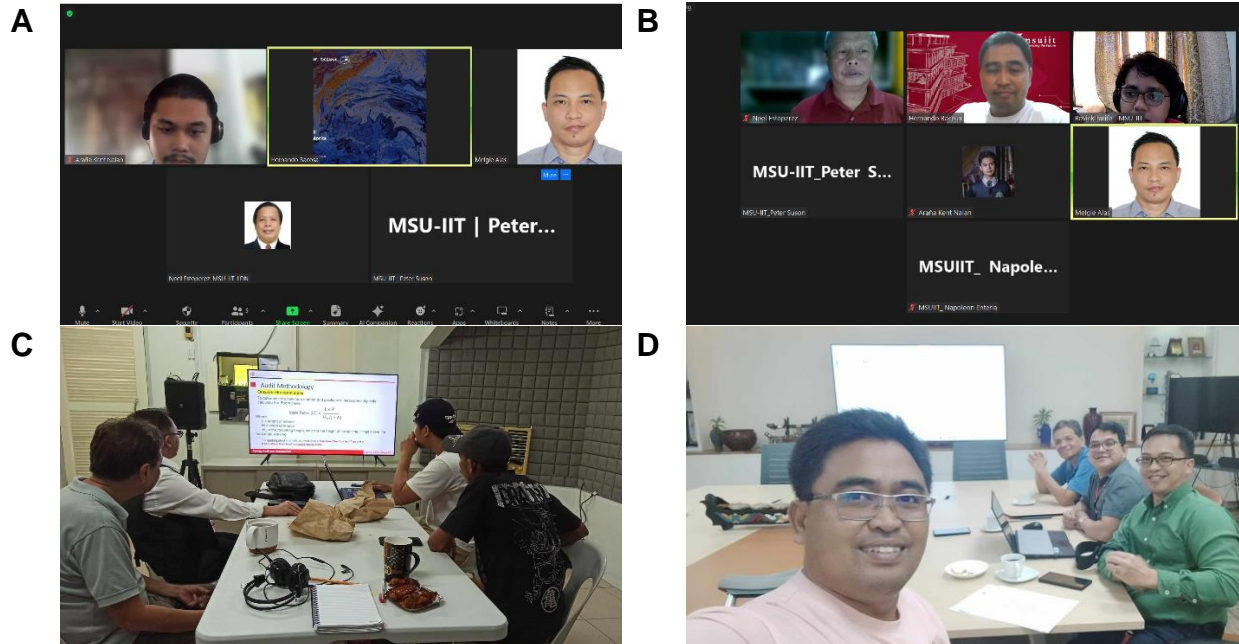


**Fig. 1.** Energy and greenhouse gas auditing of MSU-IIT buildings example of a) project management tracker and b) Gantt chart

### 2.1 Energy audit and greenhouse gas auditing project management

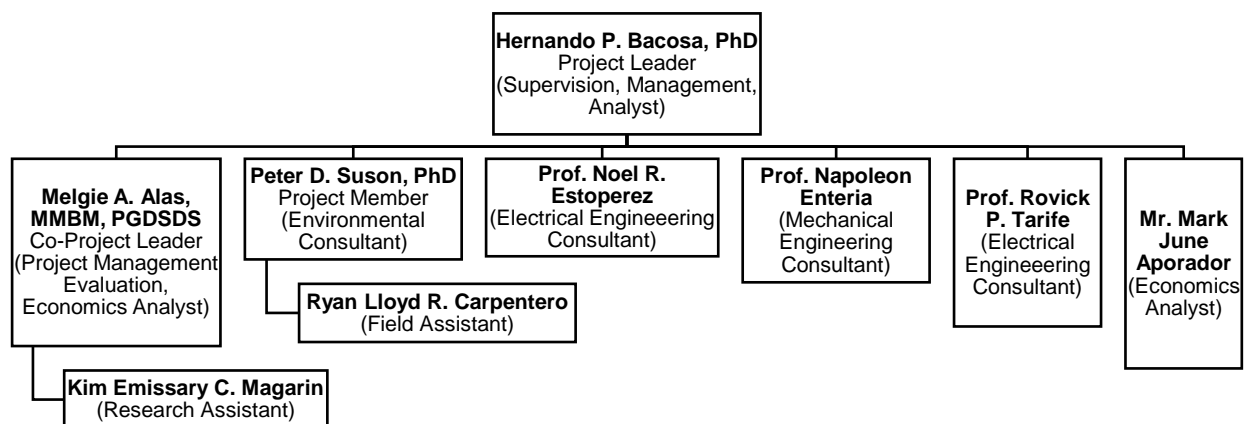
The project management employed in this project is through weekly meeting, project members progress reports, weekly evaluation of data, updating of the project management tracker, and currently, developing a project database. The weekly meeting is held every Monday of the week from 1:30-2:30 p.m. These activities are justified in Fig.

2.



**Fig. 2.** Energy and greenhouse gas audit team project meetings at a) and b) thru zoom meeting, c) data analysis at the MCR office, and d) project proposal to the chancellor's office

Then, the project's organizational structure is developed based from the project member's multiple expertise in their field (Fig. 3).



**Fig. 3.** Energy and greenhouse gas auditing of MSU-IIT buildings functional project organizational structure.

Herein, Dr. Hernando P. Bacosa, PhD, is designated as the project leader responsible for implementing and supervising the project, ultimately ensuring its success. Mr. Alas and



Mr. Aporador are assigned to handle data evaluation and economic analysis tasks. Meanwhile, Dr. Suson is responsible for supervising and evaluating the project's environmental results.

Dr. Estoperez and Dr. Tarife are assigned to evaluate the methods and data throughout the diagnostic energy audit, which involves a complex array of data. Dr. Enteria is tasked with evaluating and validating the results of the building envelope survey and humidity tests. Mr. Magarin is responsible for preparing reports, conducting surveys, validating data, and designing materials for publication. Mr. Carpentero assists the research assistant throughout the study.

## **2.2 Study area and its location profile**

This study is currently conducted at the selected MSU-IIT Buildings (Table 1). The university is situated in Iligan City, in the province of Lanao del Norte, on the island of Mindanao in the Philippines. It lies along the northern coast of the island, facing Iligan Bay, and covers an area of approximately 813.37 square kilometers. The city's topography is diverse, featuring coastal areas, flat plains, and mountainous regions. Economically, Iligan City is an important industrial hub in Mindanao. It hosts several major industries, including steel manufacturing, cement production, and hydroelectric power generation. The city's primary electrical producer is the National Power Corporation (NPC), which operates the Agus Hydroelectric Complex. This complex consists of several hydroelectric power plants located along the Agus River, which flows from Lake Lanao to Iligan Bay. The major plants in this complex include Agus I, II, IV, V, VI, and VII. Agus provides a substantial portion of the electricity consumed in the region. The hydroelectric power plants are generating an installed capacity of 727 megawatts (MW) of renewable



energy. It has a dependable capacity of around 400 MW according to Mindanao Development Authority (MinDA).

**Table 1.** Study areas of the comprehensive energy and greenhouse gas auditing of MSU-IIT buildings.

BUILDING NO.	BUILDING NAME
1	ADMINISTRATION BUILDING
2	OFFICE OF THE CHANCELLOR
3	OFFICE OF COMMUNICATIONS
5-A	OFFICE OF THE VICE CHANCELLOR FOR STRATEGIC INITIATIVES (OVCSI) / REGISTRAR
5-B	OFFICE OF THE VICE CHANCELLOR FOR INTERNATIONAL AFFAIRS (OV CIA)/LEGAL OFFICE
6	MAIN LIBRARY BUILDING
7-A	MSU-IIT CENTER FOR RESILIENCY (MCR)/ SECURITY AND INVESTIGATION DIVISION (SID) BUILDING
8	KNOWLEDGE AND TECHNOLOGY TRANSFER OFFICE (KTTO) BUILDING
14-A	COLLEGE OF SCIENCE AND MATHEMATICS (CSM) MAIN BUILDING
14-B	COLLEGE OF SCIENCE AND MATHEMATICS (CSM) ANNEX
19-A	COLLEGE OF ARTS AND SOCIAL STUDIES (CASS) OLD BUILDING
19-B	COLLEGE OF ARTS AND SOCIAL STUDIES (CASS) NEW ACADEMIC BUILDING
25-A	COLLEGE OF ENGINEERING (COE) MAIN BUILDING
25-B	COLLEGE OF ENGINEERING (COE) RIGHT-WING
25-C	COLLEGE OF ENGINEERING (COE) LEFT-WING

## 2.3 Diagnostic Energy Audit

This study is conducted through numerous phases. To begin with, the diagnostic energy audit helps determine which item of equipment is a large energy user and where energy is being wasted. The historical audit deals with overall or general energy consumption. The diagnostic audit deals with detailed specific uses of energy in all forms. In order to produce the required information, a complete inventory of all energy-using systems is prepared (Krarti, 2020). The second step is to conduct a walk-through audit of the premises to identify operational and physical problems. An example of an operational problem is a piece of equipment operating when it should be off. Physical problems





include leaking faucets, windows that fit poorly, and missing pipe insulation, among others.

It is very important to understand the existing situation before attempting improvements; otherwise, corrective efforts could be misdirected and ineffective and, hence, financially wasteful.

The objectives of the diagnostic audit are:

- (a) To identify, by way of an equipment survey, the items of equipment that are the large users of energy, so action can be taken to reduce their energy consumption and cost of operation;
- (b) To identify, by way of a building survey, areas that require upgrading or maintenance to improve energy efficiency and thus reduce the cost of operation;
- (c) To obtain the best possible return for money and effort spent on energy management.

### **2.3.1 Preparation and Planning**

Conducting a diagnostic energy audit requires thorough preparation and planning to ensure the accuracy and comprehensiveness of the results. The initial step involves defining the scope of the audit, identifying the specific areas and systems to be examined. This includes understanding the building's layout, its usage patterns, and the types of equipment and systems installed. Gathering existing energy bills, equipment manuals, and previous audit reports, if available, helps establish a baseline for the audit. Proper preparation lays the foundation for a systematic and effective energy assessment.

### **2.3.2 Equipment Survey**

The first step of the diagnostic energy audit focuses on conducting an equipment survey.

This involves inspecting all major energy-consuming equipment, such as HVAC systems,





lighting, appliances, and industrial machinery. During this phase, auditors document the type, age, condition, and operating schedules of each piece of equipment. Using a standardized checklist ensures consistency and thoroughness. Photographs and detailed notes capture the current state of the equipment. This systematic approach helps identify outdated or inefficient equipment that may contribute to excessive energy consumption.

### **2.3.3 Building and Mechanical Systems Survey**

Following the equipment survey, the next step is to conduct a building and mechanical systems survey. This involves evaluating the building's envelope, insulation, windows, doors, and other structural components that affect energy efficiency. Additionally, mechanical systems such as plumbing, ventilation, and elevators are assessed for their energy performance. Using tools like thermal imaging cameras can help detect heat loss areas and insulation deficiencies. This comprehensive assessment helps identify potential improvements in the building's overall energy performance.

### **2.3.4 Data Collection and Analysis**

Accurate data collection is crucial for a successful energy audit. Using instruments such as power meters, data loggers, and temperature sensors provides precise measurements of energy usage and environmental conditions. Collected data is meticulously recorded and organized for analysis. Analyzing the data involves comparing the recorded energy consumption against industry benchmarks and identifying patterns or anomalies. Energy modeling software can simulate different scenarios and predict the impact of potential energy-saving measures. This analytical approach helps pinpoint areas with the highest energy-saving potential.



### **2.3.5 Involvement of Personnel**

Effective energy audits often involve collaboration with building personnel who are familiar with the daily operations and maintenance practices. Engaging with facility managers, maintenance staff, and occupants can provide valuable insights into operational habits and areas of concern that might not be immediately apparent from the data alone. Their input helps understand the context behind certain energy usage patterns and in identifying practical and feasible energy-saving opportunities.

### **2.3.6 Documentation and Reporting**

Comprehensive documentation of the audit process and findings is essential for transparency and future reference. The audit report includes detailed descriptions of the methods used, the data collected, and the analysis performed. Visual aids such as graphs, charts, and photographs enhance the clarity of the report. The report also provides clear and actionable recommendations for improving energy efficiency, including cost estimates, potential savings, and implementation timelines. This structured documentation ensures that the findings and recommendations are easily understood and actionable by building owners and managers.

## **2.4 Conducting Illuminance Test**

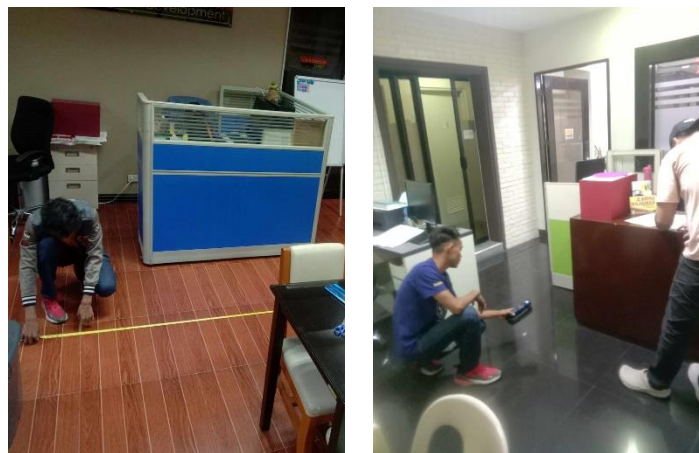
The energy audit already carried out records the number of lamps being used, their wattage, and the amount of light they provide. The next step is to find out whether the lighting levels are adequate in the various areas and whether changes should be made either on account of under/over-lighting levels or energy wastage.

### **2.4.1 Preparation of the Space**

To ensure accurate and representative measurements, it is critical to set up the testing environment to reflect typical conditions. This involves arranging furniture and equipment as they would be during normal use. Stabilizing the lighting is crucial, as some light sources, such as fluorescent or LED lights, may take a few minutes to reach their optimal brightness. Proper preparation minimizes variability and ensures that the illuminance measurements reflect real-world conditions.

### 2.4.2 Marking Measurement Points

Establishing a measurement grid allows for systematic and comprehensive coverage of the area. The choice of grid spacing depends on the purpose of the test; for general ambient lighting, a wider grid might be sufficient, while specific task areas may require denser measurements. Marking these points on both a floor plan and physically in the space ensures consistency and repeatability in the measurements. This methodical approach helps identify uneven lighting and areas that might require adjustments.



**Fig. 4.** The conducting of illuminance test and selection of test points at the OVCSI and MCR office

### 2.4.3 Calibration of the Light Meter



Calibrating the light meter according to the manufacturer's instructions is essential for obtaining accurate readings. Ensuring the meter is set to measure in lux, the standard unit of illuminance, provides consistency in the data collected. Regular calibration checks are necessary, especially if the testing involves multiple sessions or locations, to maintain the reliability of the measurements.

#### **2.4.4 Measuring Illuminance**

At each marked point, the light meter is placed steadily, using a tripod if necessary to maintain the correct height and angle. The measurement process requires careful handling to avoid any interference, such as casting shadows on the meter or blocking the light source. Recording the illuminance levels accurately at each point is crucial for the integrity of the test results. This step-by-step approach ensures that the data collected is comprehensive and reflective of the actual lighting conditions.

#### **2.4.5 Avoiding Interference**

Minimizing interference during measurements is vital for obtaining true readings. This includes controlling for additional light sources that may not be part of the regular lighting setup, such as sunlight through windows. Ensuring that the person taking the measurements does not inadvertently affect the readings by casting shadows or blocking light further ensures the accuracy of the data.

#### **2.4.6 Documenting the Results**

Accurate documentation of all measurements, including the exact location and conditions of each reading, is necessary for analysis and future reference. Photographs of the setup and measurement points can provide additional context and help in verifying the



conditions during the test. Proper documentation supports the reliability and repeatability of the test, facilitating comparisons with recommended standards and identifying areas for improvement.

## **2.5 Conducting Humidity Test**

### **2.5.1 Preparation and Planning**

Conducting humidity tests in buildings requires careful preparation and planning to ensure accurate and meaningful results. The first step is to determine the specific areas and conditions to be tested. This involves identifying spaces that are prone to humidity-related issues, such as basements, bathrooms, kitchens, and areas with poor ventilation. It's important to plan the timing of the tests to capture typical humidity levels, which might vary throughout the day and across different seasons. Proper preparation helps in obtaining a comprehensive understanding of the building's humidity profile.

### **2.5.2 Selection of Equipment**

Selecting the right equipment is crucial for conducting effective humidity tests. Hygrometers and data loggers are commonly used tools that measure and record relative humidity levels over time. Hygrometers provide instant readings, while data loggers can track humidity levels continuously over a period, offering a detailed profile of humidity fluctuations. Calibration of these instruments before use is essential to ensure accuracy. This step ensures that the readings are reliable and reflective of the actual environmental conditions.

### **2.5.3 Placement of Sensors**



Strategic placement of humidity sensors is key to obtaining representative data. Sensors should be placed in locations that are indicative of the overall humidity levels in the building. These include areas near potential sources of moisture, such as windows, doors, plumbing fixtures, and HVAC systems. Additionally, placing sensors at different heights can provide insights into humidity stratification within a room. Proper sensor placement helps capture a comprehensive picture of humidity distribution and potential problem areas.

#### **2.5.4 Conducting the Tests**

During the testing phase, it's important to maintain consistent environmental conditions to avoid skewing the results. This means avoiding activities that could temporarily alter humidity levels, such as cooking, bathing, or operating humidifiers and dehumidifiers. Regularly checking and recording the data from hygrometers and data loggers ensures that any anomalies are noted and understood. This methodical approach provides a reliable dataset for analysis.

#### **2.5.5 Data Analysis**

After collecting the data, a thorough analysis is necessary to interpret the results. Comparing the recorded humidity levels against recommended standards can help identify areas of concern. For instance, consistently high humidity levels may indicate poor ventilation or water intrusion issues, while low humidity levels could suggest the need for humidification to maintain comfort and preserve materials. Analyzing trends over time also helps understand the building's response to different environmental conditions.



### **2.5.6 Documentation and Reporting**

Proper documentation of the humidity test process and results is essential for future reference and action planning. Detailed records should include the locations and conditions of each measurement, the equipment used, and any observations made during the testing period. Photographs and floor plans can be helpful in visualizing sensor placements and test conditions. A comprehensive report summarizing the findings, along with recommendations for addressing any identified issues, provides a clear roadmap for improving indoor air quality and building performance.

Conducting humidity tests with these structured methodologies ensures that the data collected is accurate, reliable, and actionable, ultimately contributing to the health, comfort, and longevity of the building and its occupants.

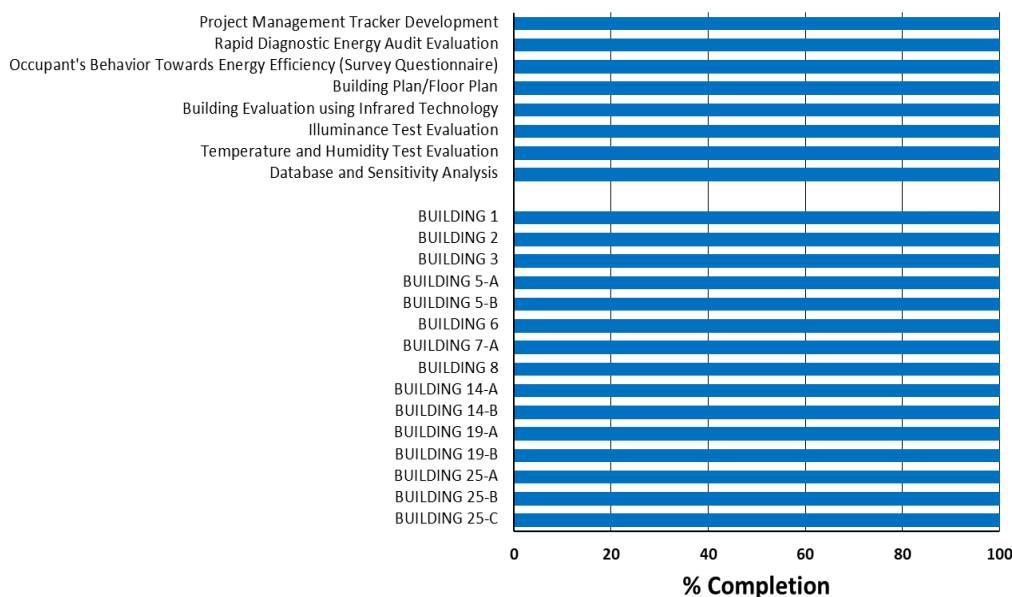


### III. Results and Discussions

This project's timeline and activities completed, on-going and to be completed are defined in detail in Section 3.1. Meanwhile, Sections 3.2, 3.3 and 3.4 are presents the preliminary results and analysis during the energy audit from October to December 2024.

#### 3.1 Project's activities

The projected activities for this project, based on its objectives, are illustrated in Figure 5. This figure represents significant progress throughout the project's duration. All data collection and analysis for this project has been completed.



**Fig. 5.** Summary of the activities of the energy and greenhouse gas auditing of MSU-IIT buildings project during the fourth quarter of year 2024.

#### 3.2 Diagnostic Energy Audit at Selected Buildings of MSU-IIT

This study's rapid diagnostic energy audit results in 15 out of 15 buildings of MSU-IIT are summarized in Table 2. Fig. 6 defined the hotspots in these buildings which are the primary contributor to the high energy consumption.



**Table 2.** Calculated energy consumption in selected buildings of MSU-IIT according to Day, Month, and Year.

Building No.	Total kilowatts	Energy Consumed (kwh)		
		Day	Month	Year
1 - Admin Building	120.51	693.19	15,004.80	180,057.65
2 - Office of the Chancellor	35.30	269.04	6,011.07	72,052.76
3 - Office of Communications	5.71	39.66	857.52	10,290.28
5A - OVCSI/Registrar/IDS Library/HRM Laboratory	114.29	591.08	12,224.78	146,697.41
5B - OV CIA/Legal Office/HRMD	23.80	147.62	3,265.85	39,190.05
6 - Main Library	119.53	741.84	15,946.09	191,353.09
7 - MCR/SID	16.72	108.48	2,367.44	28,409.19
8 - KTTO	29.41	155.46	3,210.50	38,525.94
14A - CSM (Main Building)	371.62	2,596.75	52,784.13	633,409.61
14B - CSM (Annex)	131.88	922.68	19,823.35	237,880.26
19A - CASS (Old Building)	195.74	1,071.49	21,895.27	262,743.31
19B - CASS (New Building)	327.80	2,132.78	44,934.07	539,208.83
25A - COE (Main Building)	295.09	1,907.51	33,984.97	407,819.62
25B - COE (Right Wing)	87.19	564.44	11,055.29	132,663.56
25C - COE (Left Wing)	81.74	547.68	9,685.01	116,220.08
<b>Total</b>	<b>1,787.40</b>	<b>11,377.58</b>	<b>232,309.84</b>	<b>2,787,638.00</b>



**Fig. 6.** Breakdown of energy consumption of MSU-IIT buildings according to five (5) classifications: Operations, Lighting, Electrical Appliances, HVAC (Heating, Ventilation and Air Conditioning) and Laboratory Equipment.



From the audit, Academic buildings such as CSM – Main Building, CASS – New Building and COE – Main Building had the most amount of energy consumption with a monthly of 52,784.13, 44,934.07 and 33,984.97 kWh respectively (Table 2). As for administrative buildings, Main library and Admin building had considerable amount of electrical consumption with a monthly of 15,946.09 and 15,004.80 kWh. The largest contributor of energy consumption across all buildings are HVAC. These results highlights areas of high energy usage and potential opportunities for energy efficiency improvements.

**Table 3.** Summary of functional equipment of each building

Equipment	Building No.							
	1	2	3	5A	5B	6	7	8
Operations	410	84	26	198	60	315	55	71
Lighting	258	129	27	282	76	289	22	146
Electrical Appliances	62	15	2	39	13	37	7	12
HVAC	39	8	5	22	7	29	5	9
Laboratory Equipment	0	0	0	0	0	0	0	166
<b>Total:</b>	769	236	60	541	156	670	89	
Equipment	14A	14B	19A	19B	25A	25B	25C	
Operations	783	97	230	283	532	310	274	
Lighting	1004	298	661	681	390	410	302	
Electrical Appliances	59	19	13	36	23	29	10	
HVAC	161	34	99	58	77	17	27	
Laboratory Equipment	241	75	0	242	263	33	12	
<b>Total:</b>	2248	523	1003	1300	1285	799	625	

**Table 4.** Summary of non-functional equipment of each building

Equipment	Building No.							
	1	2	3	5A	5B	6	7	8
Operations	39	9	1	15	2	33	12	5
Lighting	12	4	1	40	0	21	3	6
Electrical Appliances	4	0	0	3	0	5	1	0
HVAC	0	0	1	3	2	3	0	0
Laboratory Equipment	0	0	0	0	0	0	0	1
<b>Total:</b>	55	13	3	61	4	62	16	12



Equipment	14A	14B	19A	19B	25A	25B	25C
Operations	23	38	37	24	58	56	12
Lighting	34	69	64	3	71	232	85
Electrical Appliances	10	5	3	0	4	4	0
HVAC	7	5	18	1	21	9	5
Laboratory Equipment	8	7	0	7	13	12	6
<b>Total:</b>	<b>82</b>	<b>124</b>	<b>122</b>	<b>35</b>	<b>167</b>	<b>313</b>	<b>108</b>

The functional and non-functional equipment of each buildings was accounted. The detailed breakdown of each classes can be found at the Annex A-J. The highest number of equipment was located at Building 14A (CSM Main building). In addition, lighting and HVAC had an extensive amount of items that was identified at Building 14A (Table 3). Building 1 (Admin) had the largest number of equipment under Electrical Appliances. These results highlight the importance of improving institute-wide regulations on energy consumption to further reduce the amount of electric consumption and its corresponding greenhouse gas emissions.

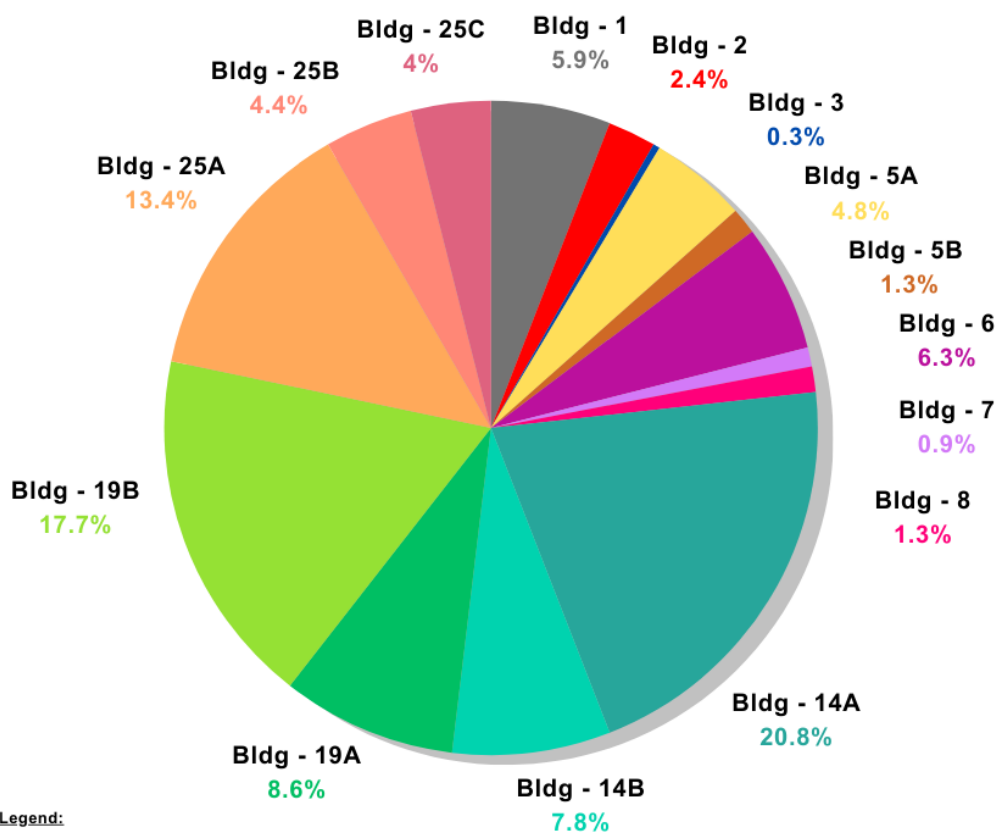
The daily carbon emission of MSU-IIT buildings resulted a similar result to the energy consumption. Buildings 14A and 19B were major contributors to GHG emissions at 0.01376 and 0.01171 ppm respectively (Table 5). These results are directly proportional to energy consumption which highlights the needs for retrofits and emphasizing the importance of focusing the energy efficiency measures in these hotspots.

**Table 5.** Calculated greenhouse gas in (ppm) in selected buildings of MSU-IIT according to Day, Month, and Year.

Building No.	GHG Emitted (ppm)		
	Day	Month	Year
1 - Admin Building	0.00018	0.00391	0.04697
2 - Office of the Chancellor	0.00007	0.00157	0.01881
3 - Office of Communications	0.00001	0.00022	0.00268



5A - OVCSI/Registrar/IDS Library/HRM Laboratory	0.00015	0.00319	0.03826
5B - OVCI/Legal Office/HRMD	0.00004	0.00085	0.01022
6 - Main Library	0.00019	0.00416	0.04991
7 - MCR/SID	0.00003	0.00062	0.00741
8 - KTTO	0.00004	0.00084	0.01005
14A - CSM (Main Building)	0.00068	0.01376	0.16514
14B - CSM (Annex)	0.00024	0.00517	0.06205
19A - CASS (Old Building)	0.00028	0.00571	0.06853
19B - CASS (New Building)	0.00056	0.01171	0.14064
25A - COE (Main Building)	0.00050	0.00886	0.10637
25B - COE (Right Wing)	0.00015	0.00288	0.03460
25C - COE (Left Wing)	0.00015	0.00261	0.03131
<b>Grand Total</b>	<b>0.003</b>	<b>0.06</b>	<b>0.73</b>



**Fig. 7. Monthly greenhouse gas emission (ppm) of MSU-IIT buildings**



The Office of Communications had the lowest GHG emissions with emissions of 0.3%, (Fig. 7). From these data, it can be inferred that areas with higher energy consumption, such as academic buildings (Buildings 14, 19 and 25) contribute more to GHG emissions. This suggests that efforts to reduce energy consumption in these areas could lead to a significant reduction in GHG emissions.

### **3.3 Illuminance Test Results at Selected Buildings of MSU-IIT**

The Department of Energy (DOE) developed the 2020 Guidelines on Energy Conserving Design for Buildings with the intention to address the needs in reducing the use of energy by formulating energy conserving design of buildings, which was to strength and support the Republic Act No. 11285, otherwise known as the Energy Efficiency and Conservation Act of 2019. The illuminance test was to determine if the amount of light generated from light sources (specifically bulbs, fluorescent lamps, etc.) in the room is appropriate to the standard requirements of the floor area. The Table 6 below shows that recommended illuminance levels in different classification of rooms and other building areas.





Task	Min. & Max. (Lux)	Applications
Lighting for infrequently used areas	50 – 100	Stairways, corridors, and Parking-Interior
	50 – 200	Storage Room-General
	100 – 300	Loading Docks, Locker Rooms, Lounge/Break Rooms and Restrooms/Toilets
	200 – 300	Bedroom-Dormitory, Cafeteria-Eating, Gymnasium-Exercise/Workout, and Lobby-Office/General
	200 – 500	Library-Stacks, Mechanical/Electrical Rooms and Retail Sales
Lighting for working and activity interiors	300 – 500	Classrooms-General, Conference Rooms, Exhibit Space, Gymnasium-Sports/Games, Library-Reading/Studying, Office-Open, and Office-Private/Closed
	300 – 750	Kitchens-Food Preparation and Workshops
Localized lighting for exacting tasks	500 – 750	Laboratory-Classrooms
	750 – 1200	Laboratory-Professional

**Table 6.** Recommended Design Illuminance Levels (based from 2020 DOE Guidelines on Energy Conserving Design of Buildings).

Using the 2020 DOE guidelines, the detailed results of the illuminance test in the rooms of the selected buildings can located in the Annex K. Overall, the illuminance levels of the most rooms of the selected buildings of MSU-IIT was discovered to be under illuminated (Table 7).

**Table 7.** Summary of illuminance levels in selected buildings of MSU-IIT.

Building No.	Average Illuminance (Lux)	Overall Illuminance Rating
1 - Admin Building	108.71	Under Illuminance
2 - Office of the Chancellor	153.55	Under Illuminance



Building No.	Average Illuminance (Lux)	Overall Illuminance Rating
3 - Office of Communications	130.38	Under Illuminance
5A - OVCSI/Registrar/IDS Library/HRM Laboratory	159.93	Under Illuminance
5B - OVCI/ Legal Office/HRMD	108.73	Under Illuminance
6 - Main Library	136.53	Under Illuminance
7 - MCR/SID	102.83	Under Illuminance
8 - KTTO	124.28	Under Illuminance
14A - CSM (Main Building)	169.87	Under Illuminance
14B - CSM (Annex)	119.37	Under Illuminance
19A - CASS (Old Building)	155.50	Under Illuminance
19B - CASS (New Building)	289.97	Under Illuminance
25A - COE (Main Building)	139.95	Under Illuminance
25B - COE (Right Wing)	204.59	Under Illuminance
25C - COE (Left Wing)	179.36	Under Illuminance

A total of 292 rooms were conducted illuminance test and only 35 of those rooms/offices were in accordance to the DOE lighting guidelines (Table 8). The majority of those rooms were located at College of Science and Mathematics (Bldg – 14A&B) and College of Engineering (Bldg – 25A,B,C). It is important to note that some of these rooms such as CSM's GL1, Room 201, Registrar and rooms located in CASS - New Building were newly renovated/established which results in an acceptable illuminance level due to new light bulbs and fluorescent lamps that were installed. This reinforces the importance of regular



monitoring and maintenance of lights to ensure the appropriate illuminance levels in a room are according to standard; in return, it can positively affect their performance (Knez, 1995).

**Table 8.** Summary of rooms/offices that have illuminance levels in acceptable levels according to DOE guidelines.

<b>Bldg #</b>	<b>Location/Station Name</b>	<b>Illuminance Rating</b>
1	Admin Bldg CR Female	Normal Illuminance
5A	Registrar	Normal Illuminance
14A	Room 125	Normal Illuminance
14A	Room behind Accreditation Room	Normal Illuminance
14A	Room 201	Normal Illuminance
14A	Room 202	Normal Illuminance
14A	Room 204	Normal Illuminance
14A	Room 205	Normal Illuminance
14A	Room 212	Normal Illuminance
14A	Room 213	Normal Illuminance
14A	Room 214	Normal Illuminance
14A	Room 215	Normal Illuminance
14A	Room 225	Normal Illuminance
14A	Room 226A	Normal Illuminance
14B	GL1	Normal Illuminance
14B	GL2	Normal Illuminance



<b>Bldg #</b>	<b>Location/Station Name</b>	<b>Illuminance Rating</b>
19B	A11 (Dean's Office)	Normal Illuminance
19B	A12 (Faculty Lounge)	Normal Illuminance
19B	B23 (Mini Leaning Commons)	Normal Illuminance
19B	C32 (Department of Philosophy and Humanities)	Normal Illuminance
19B	D42 (CASS Research Centers)	Normal Illuminance
19B	E52 & E54	Normal Illuminance
19B	E51 & E55	Normal Illuminance
25A	Room 2 (Room 203)	Normal Illuminance
25A	Room 3 (Room 205A)	Normal Illuminance
25A	Room 3 (Room 205B)	Normal Illuminance
25A	Room 211	Normal Illuminance
25A	Room 213	Normal Illuminance
25B	CREATE Lab (CerE/MetE Prep Area)	Normal Illuminance
25B	GSE Office (Room 323)	Normal Illuminance
25B	Graduate Student Lounge (Room 524)	Normal Illuminance
25C	RF Engineering Lab (Room 215)	Normal Illuminance
25C	DOST Office (Room 321)	Normal Illuminance
25C	DCHET Unit Operations Lab (Room 521)	Normal Illuminance
25C	Thesis Room/ Computer Lab (Room 525)	Normal Illuminance



### 3.4 Temperature and Relative Humidity Test Results at Selected Buildings of MSU-IIT

In this project, a total of 286 rooms, which include offices, classrooms and laboratory rooms, were conducted temperature and relative humidity tests in the selected buildings of MSU-IIT (see Annex L). The number of rooms that had air-conditioned units that were functional during the data gathering process was 221 rooms. According to the 2020 guidelines of DOE, the recommended indoor temperature of a room was 23-27°C and the relative humidity (%) was 50-60% (Department of Energy, 2020). Table 9 below shows the rooms with air-conditioning units in the selected MSU-IIT buildings that were evaluated and compared to the 2020 DOE guidelines.

**Table 9.** The percentage of rooms with air-conditioned units under the selected buildings of MSU-IIT that passed and failed to the 2020 Department of Energy guidelines.

	Indoor Temperature	Relative Humidity
Number of rooms that passed to the DOE Standard (in %)	70	43
Number of rooms that failed to the DOE Standard (in %)	30	57

The result shows that 70% of the rooms that had air-conditioning units conducted had an acceptable indoor temperature, but only 43% of those rooms were in the recommended levels of relative humidity according to the 2020 DOE guidelines. It was discovered that the mean temperature of air-conditioned units installed in the rooms/offices was 20°C (See Annex J). In addition, the mean indoor temperature and relative humidity in the rooms with air-conditioned units were 26.38°C and 57.26%. The results indicates that a



regular preventive maintenance of HVAC units in order to have better airflow and efficiency. Optimal indoor temperatures and relative humidity in an office/classroom can boost cognitive and work performance and lower the risk of infections (Wolkoff, 2021.)



#### IV. References

- Al Momani, D., Al Turk, Y., Abuashour, M. I., Khalid, H. M., Muyeen, S. M., Sweidan, T. O., Said, Z., & Hasanuzzaman, M. (2023). Energy saving potential analysis applying factory scale energy audit – A case study of food production. *Heliyon*, 9(3), e14216. <https://doi.org/10.1016/j.heliyon.2023.e14216>
- Aleluia, J., Tharakan, P., Chikkatur, A. P., Shrimali, G., & Chen, X. (2022). Accelerating a clean energy transition in Southeast Asia: Role of governments and public policy. *Renewable and Sustainable Energy Reviews*, 159, 112226. <https://doi.org/10.1016/j.rser.2022.112226>
- Department of Energy Philippines (DOE) (2020), Guidelines on Energy Conserving Designs of Buildings. Taguig City: Philippines
- Kluczek, A., & Olszewski, P. (2017). Energy audits in industrial processes. *Journal of Cleaner Production*, 142, 3437–3453. <https://doi.org/10.1016/j.jclepro.2016.10.123>
- Knez, I. (1995). Effects of indoor lighting on mood and cognition. *Journal of environmental psychology*, 15(1), 39-51. [https://doi.org/10.1016/0272-4944\(95\)90013-6](https://doi.org/10.1016/0272-4944(95)90013-6)
- Krarti, M. (2020). *Energy Audit of Building Systems: An Engineering Approach, Third Edition* (3rd ed.). CRC Press. <https://doi.org/10.1201/9781003011613>
- Lavasa, K.-M. (2015). *Energy audit of a building and feasibility study of possible improvement*. <https://repository.ihu.edu.gr/xmlui/handle/11544/379>
- Lu, M., & Lai, J. (2020). Review on carbon emissions of commercial buildings. *Renewable and Sustainable Energy Reviews*, 119, 109545. <https://doi.org/10.1016/j.rser.2019.109545>





Magrini, A., Gobbi, L., & d'Ambrosio, F. R. (2016). Energy Audit of Public Buildings: The Energy Consumption of a University with Modern and Historical Buildings. Some Results. *Energy Procedia*, 101, 169–175.

<https://doi.org/10.1016/j.egypro.2016.11.022>

Wolkoff, P., Azuma, K., & Carrer, P. (2021). Health, work performance, and risk of infection in office-like environments: The role of indoor temperature, air humidity, and ventilation. *International Journal of Hygiene and Environmental Health*, 233, 113709. <https://doi.org/10.1016/j.ijheh.2021.113709>



## **V. Problems/Difficulties encountered**

The problem encountered in this project is listed as follows.

- 1) Lack of personal protective equipment
- 2) Lack of equipment/devices that would aid the energy audit
- 3) The illuminance test cannot be done throughout the day, and no budget allocation for the research assistant and field assistant when conducting this activity at night.
- 4) Interference of daily activities of the staff in their work area during the diagnostic test.
- 5) Lack of software that would aid the database to perform comprehensive data analysis
- 6) There is also a need for the building plan of the study sites.

## **VI. Proposed or Suggested Solutions**

This project's list of proposed solutions is as follows:

- 1) A careful evaluation and personally owned PPE were provided by the field assistant.
- 2) Some equipment, such as the ladder, light meter, humidity test meter, digital voltmeter, and others, are provided by the project team members to sustain the project.
- 3) We cannot perform the illuminance test for all buildings; therefore, our proposed target is to set one building as our benchmark for this activity.
- 4) Since the PPD did not account for the purchase of additional equipment needed for the survey, project members contributed to procuring or borrowing the essential equipment.



## ANNEX

### A. Detailed breakdown of functional equipment of each building under Operations

Operations	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Amplifier	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
AVR	14	6	1	12	1	24	-	-	44	7	15	21	52	29	17
Base Radio	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Battery	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Binding Machine	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Bluetooth Speaker	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Camera	-	-	-	1	-	-	-	-	-	-	-	-	1	3	-
CCTV	-	-	-	-	-	-	-	-	29	-	40	-	3	2	2
CD - Power Supply	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Cellphone	-	7	-	8	1	-	1	-	-	-	-	-	-	-	-
Charger	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Copier	8	-	-	1	-	10	-	2	15	-	-	2	-	2	2
CPU	43	10	3	17	1	21	4	8	73	9	15	15	77	24	52
Cyber Scan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Digital Mixer	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Earbuds	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Earphones	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Fax Telephone	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Fingerprint Scanner	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-
Hard drive	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Headphone	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Headset	-	-	-	3	-	-	-	-	-	-	-	1	-	-	-
Inkjet Printer	59	8	3	21	8	46	6	13	51	12	21	31	23	36	17
Integrated Rostrum	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Integrated Sound System	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
IPAD	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Keyboard	76	13	5	33	8	52	10	13	145	10	24	47	85	44	48
Laminator Machine	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Lapel	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Laptop	9	-	-	9	7	7	3	1	55	9	15	30	26	15	4
Laserjet Printer	6	-	-	2	-	5	1	-	-	-	3	2	-	-	-



Low Binding Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mic Pad	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Microphone	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-
Monitor	76	13	7	36	8	59	10	14	164	15	29	66	133	74	69
Mouse	77	13	5	30	11	57	9	13	126	5	18	29	76	40	39
Multimedia Recorder	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Paper Shredder	2	1	-	-	1	1	-	-	3	-	-	-	-	2	-
Power Bank	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Supply	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Projector	-	-	-	2	1	2	1	-	20	6	-	3	5	1	1
RDS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Router	-	1	-	1	-	-	3	-	6	1	-	-	3	6	1
Scanner	4	1	-	-	5	1	-	-	-	-	-	2	-	-	-
Server Hub	-	-	-	-	-	-	-	-	2	4	-	-	1	-	-
Speaker	11	5	1	6	1	9	3	3	17	6	10	10	7	4	7
Speaker - Mic pod	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Tablet	-	-	-	1	2	1	-	-	-	-	-	-	-	1	-
Tablet Speaker	-	-	-	-	-	-	-	-	-	-	-	-	12	6	7
Telephone	15	1	1	4	1	13	1	1	12	-	5	2	2	1	-
Time Recorder	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Touch Unit	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
TV	8	4	-	5	1	6	1	3	16	6	28	16	6	11	4
UPS	-	-	-	1	-	-	-	-	3	5	3	1	6	-	1
Vinyl Music Player	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Webcam	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Workstation	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-
Wireless Microphone	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
<b>Total:</b>	<b>410</b>	<b>84</b>	<b>26</b>	<b>198</b>	<b>60</b>	<b>315</b>	<b>55</b>	<b>71</b>	<b>783</b>	<b>97</b>	<b>230</b>	<b>283</b>	<b>532</b>	<b>310</b>	<b>274</b>

B. Detailed breakdown of functional equipment of each building under Lighting

Lighting	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Bulb	159	6	19	87	30	175	9	96	530	103	315	50	164	9	34
Bulb - Chandelier	-	-	-	-	1	-	5	-	-	-	8	-	-	-	-
Circle Bulb	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-
Fluorescent	30	16	3	141	9	102	-	-	295	120	77	631	207	373	267
Lampshade	2	3	-	-	-	-	-	-	1	9	-	-	-	2	-
LED Light	-	-	-	-	2	-	-	-	24	-	-	-	-	-	-



Panel LED	-	27	-	-	-	4	-	-	31	-	225	-	16	2	-
Panel Pinlight	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Pinlight	67	68	5	54	34	8	8	22	105	66	35	-	-	24	1
Pinlight - Two Eye	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring Light	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
Spotlight	-	-	-	-	-	-	-	28	-	-	-	-	1	-	-
Sqaure L:ED Panel	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Stair light	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Table light	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<b>Total:</b>	<b>258</b>	<b>129</b>	<b>27</b>	<b>282</b>	<b>76</b>	<b>289</b>	<b>22</b>	<b>146</b>	<b>1004</b>	<b>298</b>	<b>661</b>	<b>681</b>	<b>390</b>	<b>410</b>	<b>302</b>

C. Detailed breakdown of functional equipment of each building under Electrical Appliances.

Electrical Appliances	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Air Fryer	-	-	-	1	-	-	-	-	1	-	-	-	-	1	-
Air Humidifier	-	1	-	-	-	-	-	-	-	-	1	-	1	-	1
Air Purifier	13	3	1	2	1	7	-	1	6	1	2	5	-	2	-
Alcohol Dispenser	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Beverage Cooler	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Blender	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
Chest Freezer	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Coffee Boiler	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Coffee Capsule Machine	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coffee Maker	6	3	1	2	1	4	1	1	5	2	1	6	1	3	1
Coffee Percolator	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
Deep Fryer	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Dish Sterilizer	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
DVD Player	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Airpot	2	2	-	3	1	-	-	1	-	-	1	2	-	-	-
Electric Ceramic Stove	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-



Electric Cooker	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-
Electric Kettle	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Mixer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Electric Skillet	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Stove	2	-	-	-	-	-	-	2	5	1	-	-	1	2	-
Exhaust Fan	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Floor Polisher	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Food Cooker	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Food Processor	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Food Warmer	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Heater	-	-	-	-	-	-	-	3	1	-	1	-	1	-	-
Kitchen Aid	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
Microwave Oven	4	1	-	1	1	3	1	-	7	3	1	4	2	3	1
Mini Refrigerator	-	-	-	-	1	1	-	-	-	-	-	-	1	1	-
Mixer	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Oven Toaster	4	-	-	1	-	1	-	-	-	-	-	2	-	-	-
Refrigerator	9	2	-	3	2	4	1	3	15	9	-	6	4	5	2
Rice Cooker	4	-	-	2	-	3	1	2	3	-	1	3	1	3	1
Small Pan	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Tableware Sterilizer	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
UV Sterilizer	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Vacuum Cleaner	-	-	-	-	-	2	-	-	1	-	-	-	1	1	-
Water Dispenser	11	3	-	3	3	10	2	2	13	2	5	6	8	6	4
<b>Total:</b>	<b>62</b>	<b>15</b>	<b>2</b>	<b>39</b>	<b>13</b>	<b>37</b>	<b>7</b>	<b>12</b>	<b>59</b>	<b>19</b>	<b>13</b>	<b>36</b>	<b>23</b>	<b>29</b>	<b>10</b>

D. Detailed breakdown of functional equipment of each building under HVAC (Heating, Ventilation and Air Conditioning).

HVAC	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Ceiling Fan	-	-	1	-	-	-	-	-	22	-	3	-	13	-	5
Ceiling Fan - Chandelier	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Clip Fan	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-



Desk Fan	-	-	-	-	-	-	-	-	5	-	-	-	-	-	2
Mini Fan	2	-	2	-	-	1	-	-	-	-	-	-	1	-	-
Orbit Fan	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-
Portable AC	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Split Type - Ceiling Cassette	-	1	-	-	-	-	-	-	-	-	-	54	-	-	-
Split Type - Floor Standing	2	2	-	7	1	2	-	-	7	7	3	-	4	-	-
Split Type - Underceiling	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Split Type - Wall Mounted	6	5	2	8	3	10	2	9	10	1	37	2	47	15	14
Stand Fan	5	-	-	-	-	1	-	-	19	3	3	2	5	-	2
Tower Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Turbo Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wall Fan	-	-	-	-	-	-	-	-	2	6	3	-	1	-	4
Window Type	21	-	-	4	3	14	3	-	94	16	49	-	6	1	-
<b>Total:</b>	<b>39</b>	<b>8</b>	<b>5</b>	<b>22</b>	<b>7</b>	<b>29</b>	<b>5</b>	<b>9</b>	<b>161</b>	<b>34</b>	<b>99</b>	<b>58</b>	<b>77</b>	<b>17</b>	<b>27</b>

E. Detailed breakdown of functional equipment of each building under Laboratory Equipment.

<b>Laboratory Equipment</b>	<b>Building No.</b>														
<b>Equipment</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>5A</b>	<b>5B</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>14A</b>	<b>14B</b>	<b>19A</b>	<b>19B</b>	<b>25A</b>	<b>25B</b>	<b>25C</b>
3D Printer	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
Air Compressor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Analytical Balance	-	-	-	-	-	-	-	-	7	8	-	-	2	-	-
Analytical Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analytical Scanning Electron	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Angle Grinter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Arbitrary Waveform Generator	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
auto Fine Coater	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Autoclave	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Automatic Gel Imaging	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
AVR	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-





Bench Micro Centrifuge	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Benchtop pH Meter	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Binocular Microscope	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Biobase	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biosafety Cabinet	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Brand New Big Machine	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Centrifuge	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-
Chemical Vapor Generator	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Circulation Aspillator	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
CLARIOstar Plus Multimode Plate Reader	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Computer Controlled Exchange Training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Constant Temperature Chamber	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Control with SPM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
D-12 Laboratory Flotation Machine	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Data Acquisition System	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
DC Power Supply	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-
Dehydrator	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Diaphragm Vacuum Pump	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Digital Analytical Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Digital Balance	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-



Digital Embroiding	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Digital Hotplate Stirrer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Digital Oscilloscope	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-
Digital Precision Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Digital Ultrasonic Cleaner	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Digital Water Bath	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Digital Wattmeters	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-
Digital Weighing Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Digital Dry Bath	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Distilling Apparatus	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Drill Press	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Drying Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Electronic Balance	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
ENA Vector Network Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Fabricator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Faraday Cage	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Floatation Dryer/Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorescence Microscope	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Forced Air Drying Oven	-	-	-	-	-	-	-	-	6	-	-	-	-	3	-	-
FPGA Boards	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-
Fraction Alllectro	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Freeze Dryer	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Freezer	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-



Fume Hood	-	-	-	-	-	-	-	-	4	3	-	-	-	-	-
Function Generator	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Furnace	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Galvanostat	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-
Gas Chromatograph	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
Generator	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Grinder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Grinder Polisher	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
Hall Effect Apparatus	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Hot Air Oven	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Hot Plate	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Hot Plate Stirrer	-	-	-	-	-	-	-	-	-	6	-	-	-	-	1
HVCC	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Hybrid Power Inverter	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Hydraulics Bench	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Hydrogen Trace Gas Generators	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Incubator	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-
Infiniivision Oscilloscopes	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Inverter	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Kesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Oven	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Lambda 35 Spectrophotometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laminar Flow Cabinet	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Laser cutting machine	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Light Microscope bay	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-



Light Microscope																
Monu	-	-	-	-	-	-	-	-	38	-	-	-	-	-	-	-
Logic Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Low Speed Centrifuge	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Lux meters	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
Magnetic Stirrer	-	-	-	-	-	-	-	-	3	1	-	-	2	-	-	-
Maxim Programmable Boards	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
Megger tester	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Metalurgical Microscope	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Micro Centrifuge	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Microscope	-	-	-	-	-	-	-	-	23	-	-	-	3	1	-	-
Microscope Extension	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-
Milling Machine	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Mini Shaker	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Mobile Studio	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-
Muffle Furnace	-	-	-	-	-	-	-	-	3	1	-	-	-	1	-	-
Multi testers	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-
MXG Analog Signal Generator	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
nanoPAC Mini Power supply	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Neycraft Furnace	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Onilab	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Orbital Shaker	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Oscilloscope	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Oven	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
Oven Dryer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Overhead crane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



P1P 3D Printer	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
PH/GRO Meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polarimeter	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Portable Welding Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Power Blend	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Power Supplies	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
Preparative HPLC	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Refrigerated Centrifuge	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Renewable Energy Kit	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-
Robots	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Roller Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Rotary Evaporator	-	-	-	-	-	-	-	-	3	1	-	-	-	-	-
Rotary Microtome	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
runVIEW Mini Blue Light Illuminator	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
S2 PUMA	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Safety Cabinet	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Saito Ring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scanning Electron Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Shaker	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Shimadzu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Shopbot CNC router	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Sieve Shaker (Ro-Tap)	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Sigex Boards	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
Simpliemp Thermal Cycler	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-



Smart Coater	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Soldering Rework Station	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Spectro Master 415 Digital Spectrophotometer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Spectrofluorometer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Spectrophotometer	-	-	-	-	-	-	-	-	2	1	-	-	-	-	-
Spectroquant Probe 300	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Spectrum 100 Optical FT-IR Spectrometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stereo Microscope	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Sterilizer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stirrer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Stirring Hot Plate	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
Super Critical Fluid Extractor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Table Top Centrifuge	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Tachometers	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-
TGA 4000 Thermogravimetric Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thermal Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Thermolyne TIUS	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Toaster Oven	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Top Balance	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-



Top Loading Balance	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Torque meters	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Trans-Blot Turbo Transfer System	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Transformer	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Trasparent Water Bath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tube Furnace	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Tunable Diode Laser	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Ultimaker Extended	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Ultimaker Extended Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Ultrasonic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Ultrasonic Cleaning Device	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Universal Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Universal Testing Machine	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
UPS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UV-VIS Spectrophotometer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
V.A Stand	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Vacuum Cleaner	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Vacuum Freeze Dryer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Vacuum Pump	-	-	-	-	-	-	-	-	1	3	-	-	-	-	1
Vacuum Rotary	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Vertical Auto Clave	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Vertical Laminar	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Visco Meter	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-



VORTEX Meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vulcan Muffle Furnace	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Water Bath	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Water Chiller	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Water Jacketed Incubator	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Water Pump	-	-	-	-	-	-	-	-	-	2	-	-	1	-	-
Water Purification System	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Waveform Generator	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-
Weighing Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wind Tunnel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wise Bath	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
<b>Total:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>166</b>	<b>241</b>	<b>75</b>	<b>0</b>	<b>242</b>	<b>263</b>	<b>33</b>	<b>12</b>

F. Detailed breakdown of non-functional equipment of each building under Operations

Operations	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Amplifier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AVR	2	-	-	1	-	5	-	-	1	-	2	1	2	4	-
Base Radio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Battery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Binding Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bluetooth Speaker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Camera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCTV	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
CD - Power Supply	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cellphone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Charger	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copier	-	-	-	2	-	1	-	-	1	-	-	-	-	1	-
CPU	5	-	-	1	-	5	1	1	2	12	6	2	27	17	1
Cyber Scan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Mixer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Earbuds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Earphones	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fax Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





Fingerprint Scanner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hard drive	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Headphone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Headset	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inkjet Printer	4	2	-	2	-	4	3	-	4	-	5	8	3	3	4
Integrated Rostrum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Integrated Sound System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IPAD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Keyboard	6	-	-	-	-	3	-	-	2	3	4	2	4	12	3
Laminator Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lapel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laptop	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
Laserjet Printer	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-
Low Binding Machine	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Mic Pad	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Microphone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monitor	14	2	1	2	-	11	1	1	4	18	10	5	13	12	3
Mouse	5	-	-	-	-	1	-	1	2	4	2	1	2	1	-
Multimedia Recorder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paper Shredder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Bank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Supply	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Projector	-	-	-	-	-	-	-	-	3	-	1	1	-	-	-
RDS	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Router	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Scanner	1	2	-	-	1	-	-	1	-	-	-	1	-	-	-
Server Hub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Speaker	1	-	-	1	1	-	-	1	2	-	2	1	2	-	-
Speaker - Mic pod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tablet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tablet Speaker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telephone	-	3	-	-	-	2	1	-	-	-	1	-	-	1	-
Time Recorder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Touch Unit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TV	1	-	-	-	-	1	5	-	1	1	4	1	1	3	-



UPS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Vinyl Music Player	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Webcam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Workstation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wireless Microphone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total:</b>	<b>39</b>	<b>9</b>	<b>1</b>	<b>15</b>	<b>2</b>	<b>33</b>	<b>12</b>	<b>5</b>	<b>23</b>	<b>38</b>	<b>37</b>	<b>24</b>	<b>58</b>	<b>56</b>	<b>12</b>

G. Detailed breakdown of non-functional equipment of each building under Lighting

Lighting	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Bulb	7	-	-	21	-	20	3	5	23	31	52	-	45	-	41
Bulb - Chandelier	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-
Circle Bulb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorescent	5	-	1	15	-	1	-	-	2	36	3	3	26	231	42
Lampshade	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED Light	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Panel LED	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
Panel Pinlight	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pinlight	-	2	-	4	-	-	-	1	9	2	6	-	-	1	-
Pinlight - Two Eye	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring Light	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spotlight	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sqaure L:ED Panel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stair light	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Table light	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total:</b>	<b>12</b>	<b>4</b>	<b>1</b>	<b>40</b>	<b>0</b>	<b>21</b>	<b>3</b>	<b>6</b>	<b>34</b>	<b>69</b>	<b>64</b>	<b>3</b>	<b>71</b>	<b>232</b>	<b>85</b>

H. Detailed breakdown of non-functional equipment of each building under Electrical Appliances.

Electrical Appliances	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Air Fryer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Air Humidifier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Air Purifier	1	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Alcohol Dispenser	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Beverage Cooler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blender	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Chest Freezer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coffee Boiler	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Coffee Capsule Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Coffee Maker	-	-	-	3	-	1	-	-	-	-	-	-	-	-	-	-
Coffee Percolator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deep Fryer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dish Sterilizer	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
DVD Player	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Electric Airpot	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Ceramic Stove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Cooker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Kettle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Mixer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Skillet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Stove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exhaust Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Floor Polisher	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Food Cooker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Food Processor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Food Warmer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kitchen Aid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microwave Oven	-	-	-	-	-	-	-	-	1	2	-	-	2	2	-	-
Mini Refrigerator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mixer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oven Toaster	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Refrigerator	-	-	-	-	-	-	-	-	3	2	1	-	-	-	-
Rice Cooker	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Small Pan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tableware Sterilizer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UV Sterilizer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vacuum Cleaner	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Water Dispenser	3	-	-	-	-	3	1	-	3	1	-	-	-	1	-
<b>Total:</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>10</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>

I. Detailed breakdown of non-functional equipment of each building under HVAC  
(Heating, Ventilation and Air Conditioning).

HVAC	Building No.														
Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
Ceiling Fan	-	-	-	3	-	-	-	-	-	-	3	-	13	-	1
Ceiling Fan - Chandelier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Clip Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Desk Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orbit Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portable AC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Split Type - Ceiling Cassette	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Split Type - Floor Standing	-	-	-	-	-	-	-	-	-	1	2	-	2	-	-
Split Type - Underceiling	-	-	-	-	-	2	-	-	1	-	-	-	-	-	-
Split Type - Wall Mounted	-	-	-	-	1	-	-	-	-	-	4	-	2	7	2
Stand Fan	-	-	-	-	-	1	-	-	1	-	-	-	-	2	2
Tower Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbo Fan	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Wall Fan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Window Type	-	-	-	-	1	-	-	-	5	4	9	-	4	-	-
<b>Total:</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>5</b>	<b>18</b>	<b>1</b>	<b>21</b>	<b>9</b>	<b>5</b>



J. Detailed breakdown of functional equipment of each building under Laboratory Equipment.

Laboratory Equipment	Building No.															
	Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B	25C
3D Printer		-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Air Compressor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analytical Balance		-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Analytical Scale		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analytical Scanning Electron		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Angle Grinter		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arbitrary Waveform Generator		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
auto Fine Coater		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Autoclave		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Automatic Gel Imaging		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AVR		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bench Micro Centrifuge		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benchtop pH Meter		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Binocular Microscope		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Biobase		-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Biosafety Cabinet		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brand New Big Machine		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Centrifuge		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemical Vapor Generator		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Circulation Aspillator		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CLARIOstar Plus Multimode Plate Reader		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Computer Controlled Exchange Training	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Constant Temperature Chamber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Control with SPM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D-12 Laboratory Flotation Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Data Acquisition System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DC Power Supply	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dehydrator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diaphragm Vacuum Pump	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Analytical Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Embroiding	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Hotplate Stirrer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Oscilloscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Precision Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Ultrasonic Cleaner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Water Bath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Wattmeters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digital Weighing Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Digital Dry Bath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distilling Apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drill Press	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drying Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Electronic Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ENA Vector Network Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabricator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Faraday Cage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Floatation Dryer/Oven	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Fluorescence Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Forced Air Drying Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FPGA Boards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fraction Allectro	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freeze Dryer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freezer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fume Hood	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Function Generator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Furnace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Galvanostat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gas Chromatograph	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Generator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grinder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grinder Polisher	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hall Effect Apparatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Air Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Plate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Plate Stirrer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HVCC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Hybrid Power Inverter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydraulics Bench	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrogen Trace Gas Generators	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Incubator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Infiniivision Oscilloscopes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inverter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kesia	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Laboratory Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lambda 35 Spectrophotometer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Laminar Flow Cabinet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laser cutting machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Microscope bay	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Microscope Monu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logic Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Low Speed Centrifuge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lux meters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnetic Stirrer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maxim Programmable Boards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Megger tester	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metalugical Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micro Centrifuge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-





Microscope Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Milling Machine	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Mini Shaker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mobile Studio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Muffle Furnace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multi testers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MXG Analog Signal Generator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nanoPAC Mini Power supply	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neycraft Furnace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Onilab	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orbital Shaker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oscilloscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oven Dryer	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Overhead crane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
P1P 3D Printer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PH/GRO Meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Polarimeter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portable Welding Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Blend	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Supplies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Preparative HPLC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigerated Centrifuge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy Kit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Robots	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roller Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Rotary Evaporator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rotary Microtome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
runVIEW Mini Blue Light Illuminator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S2 PUMA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Safety Cabinet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saito Ring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Scanning Electron Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shaker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shimamatzu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shopbot CNC router	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sieve Shaker (Ro-Tap)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sigex Boards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Simpliemp Thermal Cycler	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Smart Coater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soldering Rework Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spectro Master 415 Digital Spectrophotometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spectrofluorometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spectrophotometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spectroquant Prove 300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spectrum 100 Optical FT-IR Spectrometer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-



Stereo Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sterilizer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Stirrer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stirring Hot Plate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Super Critical Fluid Extractor	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Table Top Centrifuge	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tachometers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TGA 4000 Thermogravimetric Analyzer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Thermal Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thermolyne TIUS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Toaster Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Top Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Top Loading Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Torque meters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trans-Blot Turbo Transfer System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transformer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transparent Water Bath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tube Furnace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tunable Diode Laser	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ultimaker Extended	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ultimaker Extended Plus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ultrasonic	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-



Ultrasonic Cleaning Device	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Universal Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Universal Testing Machine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UPS	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
UV-VIS Spectrophotometer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V.A Stand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vacuum Cleaner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vacuum Freeze Dryer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vacuum Pump	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vacuum Rotary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vertical Auto Clave	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vertical Laminar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Visco Meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VORTEX Meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vulcan Muffle Furnace	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Bath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Chiller	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Jacketed Incubator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Pump	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Purification System	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waveform Generator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Weighing Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Wind Tunnel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Wise Bath	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



<b>Total:</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>13</b>	<b>12</b>	<b>6</b>
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K. Illuminance test results of rooms in the selected buildings of MSU-IIT.

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
1	OGC - Receiving Area	Under Illuminance	Under Illuminance	164.63	1 light bulb not functioning
1	OGC - Testing Center	Under Illuminance		97.51	3 light bulb not functioning
1	OGC - Director's Office	Under Illuminance		120.16	
1	OGC - Conference Room	Under Illuminance		119.60	
1	OGC - Room 1	Under Illuminance		86.55	
1	OGC - Room 2	Under Illuminance		117.85	
1	OGC - Room 3	Under Illuminance		37.61	
1	OGC - Room 4	Under Illuminance		69.25	
1	OGC - Room 5	Under Illuminance		84.31	
1	OGC - Room 6	Under Illuminance		113.51	
1	OGC - Room 7	Under Illuminance		110.13	
1	OGC - Room 8	Under Illuminance		115.65	
1	OGC - Room 9	Under Illuminance		89.81	
1	OGC - Pantry	Under Illuminance		43.58	
1	OGC - CR	Under Illuminance		54.55	
1	OIS	Under Illuminance	Under Illuminance	101.34	2 light bulbs not functioning
1	SDS	Under Illuminance	Under Illuminance	75.42	
1	OVCSS - Workstation	Under Illuminance	Under Illuminance	167.94	
1	OVCSS - Pantry	Normal Illuminance		100.82	
1	OVCSS - VC's Office	Under Illuminance		120.91	
1	OVCAF - Workstation	Under Illuminance	Under Illuminance	85.05	
1	OVCAF - Pantry	Under Illuminance		71.76	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
1	OVCAF - VC's Office	Under Illuminance		129.47	
1	COA - Workstation	Under Illuminance	Under Illuminance	114.70	
1	COA - Director's Office	Under Illuminance		255.78	
1	COA - Conference Room	Under Illuminance		198.55	
1	COA - Pantry	Under Illuminance		94.98	
1	COA - CR	Under Illuminance		30.40	
1	COA - Storage Room	Normal Illuminance		84.25	
1	Accounting Office - Workstation #1	Under Illuminance	Under Illuminance	127.59	4 light bulbs not functioning
1	Accounting Office - Pantry	Normal Illuminance		108.75	
1	Accounting Office - CR	Normal Illuminance		130.40	
1	Accounting Office - Workstation #2	Under Illuminance		131.76	
1	Accounting Office - Conference Room	Under Illuminance		105.96	
1	Accounting Office - Director's Office	Under Illuminance		87.83	1 light bulb not functioning
1	Accounting Office - Director's Office CR	Normal Illuminance		124.20	
1	IASU - Receiving Area	Under Illuminance	Under Illuminance	122.91	
1	IASU - Workstation	Under Illuminance		118.87	
1	IASU - Director's Office	Under Illuminance		153.41	
1	IASU - Director's Office CR	Normal Illuminance		125.54	
1	IASU - Pantry	Under Illuminance		81.95	
1	IASU - CR	Under Illuminance		84.88	
1	Cashiering Division - Conference Room	Under Illuminance	Under Illuminance	146.47	
1	Cashiering Division - File Room	Under Illuminance		30.92	
1	Cashiering Division - Teller	Under Illuminance		133.26	
1	Cashiering Division - Workstation #1	Under Illuminance		108.01	
1	Cashiering Division - Workstation #2	Under Illuminance		81.98	
1	Cashiering Division - Director's Office	Under Illuminance		109.90	1 light bulb not functioning



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
1	Cashiering Division - Pantry	Normal Illuminance		148.03	
1	Cashiering Division - CR Hallway	Normal Illuminance		167.25	
1	Cashiering Division - CR #1	Under Illuminance		90.76	
1	Cashiering Division - CR #2	Under Illuminance		91.62	
1	Cashiering Division - Storage Room	Under Illuminance		41.28	1 light bulb not functioning
1	Admin Bldg CR Male	Under Illuminance	Under Illuminance	95.83	
1	Admin Bldg CR Female	Normal Illuminance	Normal Illuminance	172.93	
2	OCS - Receiving Area	Under Illuminance	Under Illuminance	160.74	
2	OCS - Workstation #1	Under Illuminance		148.39	
2	OCS - Workstation #2	Under Illuminance		250.97	
2	OCS - Workstation #3/Storage	Under Illuminance		245.16	
2	OCS - Pantry	Normal Illuminance		193.18	
2	OCS - CR Male	Under Illuminance		59.12	
2	OCS - CR Female	Under Illuminance		69.89	
2	OCS - CR Hallway	Normal Illuminance	Under Illuminance	94.72	
2	OC - Boardroom	Under Illuminance		234.13	2 panel lights not functioning
2	OC - Hallway	Normal Illuminance	Under Illuminance	198.08	
2	OC - Chancellor's Office #1	Under Illuminance		255.46	
2	OC - Chancellor's Office #2	Under Illuminance		218.77	
2	OC - Receiving Area	Under Illuminance		147.84	1 light bulb not functioning
2	OC - Workstation (beside Receiving Area)	Under Illuminance		126.99	
2	OC - Workstation (behind Receiving Area) #1	Under Illuminance		139.17	
2	OC - Workstation (behind Receiving Area) #2	Under Illuminance		64.74	
2	OC - CR Male	Normal Illuminance		119.29	
2	OC - CR Female	Normal Illuminance		132.90	
2	OC - Pantry	Under Illuminance		57.94	
3	Office of Comms - Receiving Area	Under Illuminance	Under Illuminance	72.24	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
3	Office of Comms - Workstation	Under Illuminance		166.80	3 light bulbs not functioning
3	Office of Comms - Pantry	Under Illuminance		152.08	
5A	Registrar - Receiving	Normal Illuminance	Normal Illuminance	402.03	
5A	Registrar - Workstation #1	Normal Illuminance		439.73	
5A	Registrar - Workstation #2	Normal Illuminance		358.08	
5A	Registrar - Director's Office	Under Illuminance		191.22	
5A	Registrar - Conference Room	Under Illuminance		256.37	
5A	Registrar - File Storage	Normal Illuminance		313.05	
5A	Registrar - Pantry	Normal Illuminance		165.44	
5A	Registrar - Storage	Under Illuminance		32.30	
5A	Registrar - CR Male	Under Illuminance		35.88	
5A	Registrar - CR Female	Under Illuminance		59.38	
5A	HRM Laboratory - Stockroom	Normal Illuminance	Under Illuminance	90.34	
5A	HRM Laboratory - Hot Kitchen	Under Illuminance		158.13	
5A	HRM Laboratory - Oven Area	Under Illuminance		146.08	
5A	HRM Laboratory - Dining Hall	Under Illuminance		69.10	
5A	HRM Laboratory - CR Male	Normal Illuminance		100.44	
5A	HRM Laboratory - CR Female	Under Illuminance		73.25	
5A	OVCSI - Pantry	Under Illuminance	Under Illuminance	128.10	
5A	OVCSI - Conference Room	Under Illuminance		134.04	
5A	OVCSI - VC's Office	Under Illuminance		159.19	
5A	OVCSI - CR Male	Under Illuminance		58.84	
5A	OVCSI - CR Female	Under Illuminance		59.56	
5A	OVCSI - CR Receiving	Under Illuminance		31.45	
5A	OVCSI - Receiving Area	Under Illuminance		118.88	
5A	OVCSI - Workstation (OME)	Under Illuminance		208.58	
5A	OVCSI - Working Station (Main)	Under Illuminance		208.85	





Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
5B	OVCIA - Workstation	Under Illuminance	Under Illuminance	175.09	
5B	OVCIA - Pantry	Normal Illuminance		263.27	
5B	OVCIA - CR Male	Under Illuminance		36.57	
5B	OVCIA - CR Female	Under Illuminance		41.54	
5B	OVCIA - Conference Room	Under Illuminance		211.62	
5B	OVCIA - VC's Office	Under Illuminance		121.17	
5B	Legal Office - Main	Under Illuminance	Under Illuminance	132.08	
5B	Legal Office/HRMD - CR Male	Under Illuminance		69.83	
5B	Legal Office/HRMD - CR Female	Under Illuminance		60.61	
5B	Legal Office/HRMD - Pantry	Under Illuminance		14.44	
5B	HRMD - File Room	Under Illuminance	Under Illuminance	45.42	
5B	HRMD - Workstation	Under Illuminance		133.08	
6	Minitheater	Under Illuminance	Under Illuminance	30.96	
6	OASG - Receiving Area	Under Illuminance	Under Illuminance	171.79	
6	OASG - Conference Room	Under Illuminance		263.25	
6	OASG - Workstation	Under Illuminance		239.95	
6	OASG - Director's Office	Under Illuminance		239.95	
6	OASG - Hallway	Normal Illuminance		306.42	
6	OASG - Pantry	Under Illuminance		77.61	
6	OASG - CR	Under Illuminance		85.92	
6	BMO - Workstation	Under Illuminance	Under Illuminance	254.81	
6	BMO - Conference Room	Under Illuminance		242.53	
6	BMO - Director's Office	Under Illuminance		156.61	
6	BMO - Pantry	Normal Illuminance		116.78	
6	BMO - CR	Normal Illuminance		100.01	
6	Main Library - Student's Area	Under Illuminance	Under Illuminance	209.01	
6	Main Library - Library Head's Office	Under Illuminance		159.87	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
6	Main Library - Digitization Room	Under Illuminance		73.49	
6	Main Library - General Filipiana	Under Illuminance		197.74	
6	OVCRE - Workstation #1	Under Illuminance	Under Illuminance	92.82	
6	OVCRE - Workstation #2	Under Illuminance		81.35	
6	OVCRE - ORD	Under Illuminance		81.27	
6	OVCAA - VC's Office	Under Illuminance		150.26	
6	OVCAA - VC's CR	Under Illuminance		89.87	
6	OVCRE - Conference Room	Under Illuminance		205.95	
6	OVCRE - VC's Office	Under Illuminance		140.40	
6	OVCRE - CR Male	Under Illuminance		56.43	
6	OVCRE - CR Female	Under Illuminance		51.02	
6	OVCRE - Pantry	Under Illuminance		145.43	Broken Switch
6	OVCRE - Director of Research's Office	Under Illuminance		110.74	
6	OUR (Archive Section) - Main	Under Illuminance	Under Illuminance	44.31	
6	OUR (Archive Section) - Outside Storage Area	Under Illuminance		16.93	
6	OUR (Archive Section) - Storage Area	Under Illuminance		38.90	
7	SID - Main Office	Under Illuminance	Under Illuminance	79.98	
7	SID - Director's Office	Under Illuminance		84.87	
7	SID - Pantry	Under Illuminance		50.21	
7	SID - CR	Under Illuminance		85.70	
7	MCR - Conference Room	Under Illuminance	Under Illuminance	149.26	
7	MCR - Director's Office	Under Illuminance		135.03	
7	MCR - Workstation	Under Illuminance		135.39	
7	MCR - Pantry	Under Illuminance		145.43	
7	MCR - CR	Under Illuminance		59.56	
14A	Marine Science Dept (Room 102 & 103)	Under Illuminance	Under Illuminance	82.91	
14A	Room 104 (CSM Guidance Office)				
14A	Room 105	Under Illuminance	Under Illuminance	59.10	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
14A	Room 106	Under Illuminance	Under Illuminance	139.49	
14A	Room 107				Danger/Locked
14A	Room 108	Under Illuminance	Under Illuminance	153.77	
14A	Room 109	Under Illuminance	Under Illuminance	49.54	
14A	Room 110	Under Illuminance	Under Illuminance	49.57	
14A	Room 111/112	Under Illuminance	Under Illuminance	48.66	
14A	Room 113	Under Illuminance	Under Illuminance	102.57	
14A	Room 114 (Receiving Area)	Under Illuminance	Under Illuminance	181.41	
14A	Room 114 (Main Office)	Under Illuminance	Under Illuminance	201.10	
14A	Room 116	Under Illuminance	Under Illuminance	121.19	
14A	Room 117	Under Illuminance	Under Illuminance	106.69	
14A	SMAS	Under Illuminance	Under Illuminance	108.14	
14A	Room 119	Under Illuminance	Under Illuminance	226.28	
14A	Room 120	Under Illuminance	Under Illuminance	200.77	
14A	Room 121	Under Illuminance	Under Illuminance	136.37	
14A	Room 122 & 123	Under Illuminance	Under Illuminance	109.44	
14A	Room 124	Under Illuminance	Under Illuminance	111.94	
14A	Room 125	Normal Illuminance	Normal Illuminance	345.25	
14A	Room 127	Under Illuminance	Under Illuminance	132.17	
14A	Room 128	Under Illuminance	Under Illuminance	247.98	
14A	Room 129	Under Illuminance	Under Illuminance	98.74	
14A	Room 130	Under Illuminance	Under Illuminance	92.25	
14A	Room 131	Under Illuminance	Under Illuminance	99.11	
14A	Room 132	Under Illuminance	Under Illuminance	136.62	
14A	Room 133	Under Illuminance	Under Illuminance	60.42	
14A	KMP	Under Illuminance	Under Illuminance	133.25	
14A	CR Male	Under Illuminance	Under Illuminance	70.10	
14A	CR Female	Under Illuminance	Under Illuminance	31.48	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
14A	Accreditation Room #1	Under Illuminance	Under Illuminance	258.62	
14A	Accreditation Room #2	Under Illuminance		202.13	
14A	Room behind Accreditation Room	Normal Illuminance	Normal Illuminance	318.64	
14A	Room 201	Normal Illuminance	Normal Illuminance	465.29	
14A	Room 202	Normal Illuminance	Normal Illuminance	411.15	
14A	Room 203	Under Illuminance	Under Illuminance	143.36	
14A	Room 204	Normal Illuminance	Normal Illuminance	620.54	
14A	Room 205	Normal Illuminance	Normal Illuminance	531.62	
14A	Room 206	Under Illuminance	Under Illuminance	275.47	
14A	Room 207	Under Illuminance	Under Illuminance	73.38	
14A	Room 208	Under Illuminance	Under Illuminance	160.01	
14A	Room 209	Under Illuminance	Under Illuminance	250.38	
14A	Room 210B	Under Illuminance	Under Illuminance	229.59	
14A	Room 211	Under Illuminance	Under Illuminance	190.59	
14A	Room 212	Normal Illuminance	Normal Illuminance	321.85	
14A	Room 213	Normal Illuminance	Normal Illuminance	322.89	
14A	Room 214	Normal Illuminance	Normal Illuminance	374.70	
14A	Room 215	Normal Illuminance	Normal Illuminance	414.83	
14A	Room 216	Under Illuminance	Under Illuminance	77.88	
14A	Room 217	Under Illuminance	Under Illuminance	99.23	
14A	Room 218	Under Illuminance	Under Illuminance	126.76	
14A	Dept of Math & Statistics (Room 219)	Under Illuminance	Under Illuminance	103.03	
14A	Dept of Math & Statistics (Room 220)	Under Illuminance		266.84	
14A	Room 221A	Under Illuminance	Under Illuminance	69.90	
14A	Room 221B	Under Illuminance	Under Illuminance	46.65	
14A	Room 222	Under Illuminance	Under Illuminance	151.56	
14A	Room 223	Under Illuminance	Under Illuminance	213.86	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
14A	Room 224	Under Illuminance	Under Illuminance	128.83	
14A	Room 225	Normal Illuminance	Normal Illuminance	363.01	
14A	Room 226	Under Illuminance	Under Illuminance	164.34	
14A	Room 226A	Normal Illuminance	Normal Illuminance	558.11	
14A	Room 227	Under Illuminance	Under Illuminance	129.48	
14A	Room 228 - Main	Under Illuminance	Under Illuminance	269.10	
14A	Room 228B	Under Illuminance	Under Illuminance	149.43	
14A	Chemistry Department (Room 302)	Under Illuminance	Under Illuminance	148.27	
14A	Chemistry Department (Kitchen)	Under Illuminance		105.03	
14A	Chemistry Department (Glass Room)	Under Illuminance		177.94	
14A	Chemistry Department (Room 331)	Under Illuminance		165.34	
14A	Room 306	Under Illuminance	Under Illuminance	90.29	
14A	Instrument Room (Room 307)	Under Illuminance	Under Illuminance	191.81	
14A	Room 308	Under Illuminance	Under Illuminance	66.58	
14A	Room 309/Room 310	Under Illuminance	Under Illuminance	51.27	
14A	Room 311	Under Illuminance	Under Illuminance	205.65	
14A	Room 313	Under Illuminance	Under Illuminance	108.11	
14A	Room 312	Under Illuminance	Under Illuminance	38.18	
14A	Room 314	Under Illuminance	Under Illuminance	76.56	
14A	Room 315	Under Illuminance	Under Illuminance	93.83	
14A	Room 316	Under Illuminance	Under Illuminance	111.45	
14A	CR Male	Under Illuminance	Under Illuminance	45.45	
14A	CR Female	Under Illuminance	Under Illuminance	150.68	
14A	Room 317	Under Illuminance	Under Illuminance	77.25	
14A	Room 318	Under Illuminance	Under Illuminance	157.83	
14A	Room 319	Under Illuminance	Under Illuminance	210.74	
14A	CSM Library - Room 320	Under Illuminance	Under Illuminance	233.05	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
14A	Room 322	Under Illuminance	Under Illuminance	93.20	
14A	Room 323	Under Illuminance	Under Illuminance	89.64	
14A	Room 325&326	Under Illuminance	Under Illuminance	121.54	
14A	Room 327&328	Under Illuminance	Under Illuminance	170.98	
14A	Room 329	Under Illuminance	Under Illuminance	169.00	
14A	Room 330	Under Illuminance	Under Illuminance	135.89	
14A	Glass Room	Under Illuminance	Under Illuminance	29.77	
14A	Museum	Under Illuminance	Under Illuminance	23.66	
14B	LHA	Under Illuminance	Under Illuminance	111.42	
14B	LHB	Under Illuminance	Under Illuminance	47.98	
14B	LHC	Under Illuminance	Under Illuminance	56.39	
14B	Graduate Lounge	Under Illuminance	Under Illuminance	53.39	
14B	CR - Male	Under Illuminance	Under Illuminance	49.02	
14B	CR - Female				
14B	Faculty & Preparation Room				
14B	Chemical Room	Under Illuminance	Under Illuminance	92.50	
14B	GL1	Normal Illuminance	Normal Illuminance	357.21	
14B	BRTCM				Under renovation
14B	GL2	Normal Illuminance	Normal Illuminance	352.26	
14B	Room 229 (#1)	Under Illuminance	Under Illuminance	115.84	
14B	Room 229 (#2)	Under Illuminance		224.07	
14B	Room 230	Under Illuminance	Under Illuminance	86.34	
14B	Room 231	Under Illuminance	Under Illuminance	55.92	
14B	Room 232	Under Illuminance	Under Illuminance	56.39	
14B	CR Female	Under Illuminance	Under Illuminance	45.63	
14B	Room infront of Room 229	Under Illuminance	Under Illuminance	115.28	
14B	Theory Room	Under Illuminance	Under Illuminance	66.00	
14B	Room 332	Under Illuminance	Under Illuminance	195.51	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
14B	Room 333	Under Illuminance	Under Illuminance	93.98	
14B	Room 334	Under Illuminance	Under Illuminance	86.14	
14B	Room 335 - A	Under Illuminance	Under Illuminance	227.33	
14B	Room 336	Under Illuminance	Under Illuminance	195.26	
14B	CR near 336				Locked
14B	Room 337	Under Illuminance	Under Illuminance	198.80	
14B	Room 338	Under Illuminance	Under Illuminance	98.54	
14B	Room 339	Under Illuminance	Under Illuminance	84.71	
14B	CR Beside Room 339	Under Illuminance	Under Illuminance	56.64	
14B	Asceptic Room	Under Illuminance	Under Illuminance	104.31	
14B	CR - F	Under Illuminance	Under Illuminance	90.57	
14B	Marine Museum	Under Illuminance	Under Illuminance	24.86	
19A	Room 107	Under Illuminance	Under Illuminance	187.73	
19A	Room 108	Under Illuminance	Under Illuminance	179.01	
19A	Room 109	Under Illuminance	Under Illuminance	180.02	
19A	Room 110	Under Illuminance	Under Illuminance	155.77	
19A	Room 111	Under Illuminance	Under Illuminance	166.52	
19A	Room 112	Under Illuminance	Under Illuminance	156.19	
19A	Room 113	Under Illuminance	Under Illuminance	227.64	
19A	Room 114	Under Illuminance	Under Illuminance	170.72	
19A	Room 115	Under Illuminance	Under Illuminance	152.09	
19A	Room 116	Under Illuminance	Under Illuminance	230.38	
19A	Room 117	Under Illuminance	Under Illuminance	180.42	
19A	Room 118	Under Illuminance	Under Illuminance	177.42	
19A	Room 119	Under Illuminance	Under Illuminance	156.76	
19A	Room 120	Under Illuminance	Under Illuminance	274.19	
19A	Room 121	Under Illuminance	Under Illuminance	140.62	
19A	Department of Psychology (#1)	Under Illuminance	Under Illuminance	113.85	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19A	Department of Psychology (#2)	Under Illuminance		76.62	
19A	Department of Psychology (#3)	Under Illuminance		131.14	
19A	CASS EC	Under Illuminance	Under Illuminance	53.63	
19A	CASS Library (#1)	Under Illuminance	Under Illuminance	165.94	
19A	CASS Library (#2)	Under Illuminance		93.09	
19A	SIS	Under Illuminance	Under Illuminance	74.76	
19A	CASS Guidance Office	Under Illuminance	Under Illuminance	103.44	
19A	Department of History	Under Illuminance	Under Illuminance	104.74	
19A	History Library	Under Illuminance	Under Illuminance	20.77	
19A	Filipino Library	Under Illuminance	Under Illuminance	260.58	
19A	Sociology Department - 1	Under Illuminance	Under Illuminance	103.81	
19A	Sociology Department - 2	Under Illuminance		124.45	
19A	Room 208	Under Illuminance	Under Illuminance	228.28	
19A	Room 209	Under Illuminance	Under Illuminance	211.89	
19A	Room 210	Under Illuminance	Under Illuminance	230.08	
19A	Room 211	Under Illuminance	Under Illuminance	213.43	
19A	Room 212	Under Illuminance	Under Illuminance	211.76	
19A	Room 213	Under Illuminance	Under Illuminance	194.49	
19A	Room 214	Under Illuminance	Under Illuminance	209.40	
19A	Room 215	Under Illuminance	Under Illuminance	228.09	
19A	Room 216	Under Illuminance	Under Illuminance	221.28	
19A	Room 217	Under Illuminance	Under Illuminance	212.00	
19A	Room 218	Under Illuminance	Under Illuminance	191.81	
19A	Room 219	Under Illuminance	Under Illuminance	183.61	
19A	Room 220	Under Illuminance	Under Illuminance	200.39	
19A	Room 221	Under Illuminance	Under Illuminance	217.78	
19A	Room 222	Under Illuminance	Under Illuminance	220.88	





Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19A	CR Female (2F)	Under Illuminance	Under Illuminance	78.26	
19A	CR Male (2F)	Under Illuminance	Under Illuminance	286.96	
19A	Room 301	Under Illuminance	Under Illuminance	35.90	
19A	Room 302	Under Illuminance	Under Illuminance	41.48	
19A	Room 304	Under Illuminance	Under Illuminance	52.67	
19A	Room 305	Under Illuminance	Under Illuminance	58.44	
19A	Room 306	Under Illuminance	Under Illuminance	55.95	
19A	Computer Laboratory	Under Illuminance	Under Illuminance	158.43	
19A	College of Law Library	Under Illuminance	Under Illuminance	47.90	
19A	Kalimulan	Under Illuminance	Under Illuminance	165.77	
19A	College of Law	Under Illuminance	Under Illuminance	87.40	
19A	Octava Office	Under Illuminance	Under Illuminance	207.86	
19A	Multimedia Room (Octava)	Under Illuminance	Under Illuminance	93.45	
19A	CR Female (3F)				Locked
19B	A11 (Dean's Office - Receiving Area)	Normal Illuminance	Normal Illuminance	360.76	
19B	A11 (Dean's Office - Dean's Office)	Under Illuminance		163.81	
19B	A11 (Dean's Office - Asst. Dean's Office)	Normal Illuminance		450.93	
19B	A11 (Dean's Office - Photocopy Room)	Normal Illuminance		269.77	
19B	A11 (Dean's Office - Stockroom)	Normal Illuminance		219.54	
19B	A11 (Dean's Office - Conference Room)	Normal Illuminance		490.95	
19B	A11 (Dean's Office - Pantry)	Normal Illuminance	Normal Illuminance	161.13	
19B	A12 (Faculty Lounge - Main Area)	Normal Illuminance		294.78	
19B	A12 (Faculty Lounge - Pantry)	Normal Illuminance		272.77	
19B	A12 (Faculty Lounge - Female Lounge)	Normal Illuminance		185.57	
19B	A12 (Faculty Lounge - Male Lounge)				
19B	B21 (English Department) - Faculty	Under Illuminance	Under Illuminance	232.36	
19B	B21 (English Department) - Graduate Lounge	Normal Illuminance		324.98	
19B	B21 (English Department) - Chairperson's Office	Under Illuminance		273.86	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19B	B21 (English Department) - Archives	Normal Illuminance		183.17	
19B	B21 (English Department) - Pantry	Normal Illuminance		370.75	
19B	B22 - Langkit Office	Under Illuminance	Under Illuminance	276.06	
19B	B23 (Mini Leaning Commons)	Normal Illuminance	Normal Illuminance	410.82	
19B	B23 (Mini Leaning Commons) - Pantry	Normal Illuminance	Normal Illuminance	279.78	
19B	C31 (Department of Filipino and Other Languages) - Entrance	Under Illuminance	Under Illuminance	283.30	
19B	C31 (Department of Filipino and Other Languages) - Grad Conference	Under Illuminance		230.10	
19B	C31 (Department of Filipino and Other Languages) - Office of Dept Chairperson	Under Illuminance		242.70	
19B	C31 (Department of Filipino and Other Languages) - Faculty	Under Illuminance		240.91	
19B	C31 (Department of Filipino and Other Languages) - Pantry	Normal Illuminance		213.79	
19B	C31 (Department of Filipino and Other Languages) - Archives Room	Normal Illuminance		227.83	
19B	C32 Department of Philosophy and Humanities - Faculty	Normal Illuminance	Normal Illuminance	452.55	
19B	C32 Department of Philosophy and Humanities - Office of Dept Chairperson	Normal Illuminance		516.60	
19B	C32 Department of Philosophy and Humanities - Grad Conference	Normal Illuminance		370.40	
19B	C32 Department of Philosophy and Humanities - Pantry	Normal Illuminance		272.73	
19B	C32 Department of Philosophy and Humanities - Archives Room	Normal Illuminance		330.39	
19B	D42 (CASS Research Centers) - #1	Normal Illuminance	Normal Illuminance	365.61	
19B	D42 (CASS Research Centers) - #2	Under Illuminance		226.09	
19B	D42 (CASS Research Centers) - #3	Under Illuminance			
19B	D42 (CASS Research Centers) - #4	Under Illuminance		293.45	
19B	D42 (CASS Research Centers) - #5	Normal Illuminance		434.50	
19B	D42 (CASS Research Centers) - #6	Normal Illuminance		352.58	
19B	Political Science Department - Chairperson's Office	Under Illuminance	Under Illuminance	260.22	
19B	Political Science Department - Faculty Office	Under Illuminance		294.69	
19B	Political Science Department - Pantry	Normal Illuminance		261.77	
19B	Political Science Department - Archives	Normal Illuminance		232.89	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19B	Political Science Department - Conference Room	Normal Illuminance		341.09	
19B	5F CR - Female	Under Illuminance	Under Illuminance	69.97	
19B	5F CR - Male	Under Illuminance	Under Illuminance	35.22	
19B	E53	Under Illuminance	Under Illuminance	299.62	
19B	E52 & E54	Normal Illuminance	Normal Illuminance	393.60	
19B	E51 & E55	Normal Illuminance	Normal Illuminance	318.37	
19B	E56 & E57	Under Illuminance	Under Illuminance	261.20	
25A	Room 101	Under Illuminance	Under Illuminance	96.44	
25A	Room 102	Under Illuminance	Under Illuminance	84.19	
25A	Room 103 (Valcree)	Under Illuminance	Under Illuminance	234.90	
25A	Room 104 (Mechanical Lab)	Under Illuminance	Under Illuminance	108.30	
25A	Room 105	Under Illuminance	Under Illuminance	99.82	
25A	Room 106	Under Illuminance	Under Illuminance	75.65	
25A	Energy Conversion Lab (Room 107)	Under Illuminance	Under Illuminance	94.79	
25A	Room 108				
25A	GIS Resource Center (Room 109)	Under Illuminance	Under Illuminance	86.73	
25A	Room 110	Under Illuminance	Under Illuminance	103.00	
25A	DMRET Stockroom (Room 111 A&B)	Under Illuminance	Under Illuminance	107.18	
25A	DOST/MIDSA	Under Illuminance	Under Illuminance	76.48	
25A	Room 112	Under Illuminance	Under Illuminance	102.03	
25A	Room 113A	Under Illuminance	Under Illuminance	77.10	
25A	Room 113B	Under Illuminance	Under Illuminance	89.92	
25A	Room 114	Under Illuminance	Under Illuminance	68.44	
25A	CR Male	Under Illuminance	Under Illuminance	68.05	
25A	CR Female	Under Illuminance	Under Illuminance	51.43	
25A	Room 1 (Room 201)	Under Illuminance	Under Illuminance	111.00	
25A	Room 9 (Room 202)	Under Illuminance	Under Illuminance	97.08	
25A	Room 2 (Room 203)	Normal Illuminance	Normal Illuminance	344.13	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
25A	Room 10 (Room 204)				
25A	Room 3 (Room 205A)	Normal Illuminance	Normal Illuminance	532.10	
25A	Room 3 (Room 205B)	Normal Illuminance	Normal Illuminance	408.41	
25A	Room 11 (Room 206)	Under Illuminance	Under Illuminance	117.03	
25A	Room 207	Under Illuminance	Under Illuminance	63.38	
25A	Room 12 (Room 208)	Under Illuminance	Under Illuminance	122.59	Two fluorescent lights near the door are flickering
25A	Room 209 A/B	Under Illuminance	Under Illuminance	94.75	
25A	Room 209 C	Under Illuminance	Under Illuminance	157.19	
25A	Room 210	Under Illuminance	Under Illuminance	235.86	
25A	Room 211	Normal Illuminance	Normal Illuminance	353.47	
25A	Room 212	Under Illuminance	Under Illuminance	184.71	
25A	Room 213	Normal Illuminance	Normal Illuminance	311.41	
25A	Room 214 A	Under Illuminance	Under Illuminance	161.05	
25A	Room 214 B	Under Illuminance	Under Illuminance	204.88	
25A	Room 13C (Room 214C)	Under Illuminance	Under Illuminance	155.94	
25A	2F - CR Male	Under Illuminance	Under Illuminance	28.13	
25A	2F - CR Female	Under Illuminance	Under Illuminance	35.44	
25A	MetE Grad/Proj Room (Room 301)	Under Illuminance	Under Illuminance	136.40	
25A	Room 302 A/B	Under Illuminance	Under Illuminance	91.38	
25A	Guidance Office (Room 303)	Under Illuminance	Under Illuminance	115.42	
25A	Room 304	Under Illuminance	Under Illuminance	78.48	
25A	DMET Comp Room (Room 305)	Under Illuminance	Under Illuminance	92.38	
25A	Room 306 A/B	Under Illuminance	Under Illuminance	50.14	
25A	Room 308 A/B	Under Illuminance	Under Illuminance	67.07	
25A	DCHET Lab (Creencia) (Room 309)	Under Illuminance	Under Illuminance	121.58	
25A	Room 310 A/B	Under Illuminance	Under Illuminance	100.91	
25A	Room 312	Under Illuminance	Under Illuminance	91.38	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
25A	DMRET - Lazer/EM Comp Room (Room 311)	Under Illuminance	Under Illuminance	146.36	
25A	DMRET - Lazer/EM Comp Room (Room 313)	Under Illuminance	Under Illuminance	131.30	
25A	Room 314	Under Illuminance	Under Illuminance	110.90	
25A	MetE Dark Room (Room 315)	Under Illuminance	Under Illuminance	202.22	
25A	Amphitheater	Under Illuminance	Under Illuminance	87.33	
25A	3F - Main (Male)				Locked
25B	Fablab (Room 122)	Under Illuminance	Under Illuminance	229.83	
25B	Fablab (Room 124)	Under Illuminance		245.72	
25B	DMET (Fluid Science Lab) (Room 126)	Under Illuminance	Under Illuminance	196.27	
25B	CREATE Lab #1 (CerE/MetE Prep Area)	Normal Illuminance	Normal Illuminance	331.09	
25B	CREATE Lab #2 (DCET Material Prep Lab)	Normal Illuminance			
25B	Room 224 - Dean's Office	Under Illuminance	Under Illuminance	74.93	
25B	Room 224 - Outside Dean's Office	Under Illuminance		82.22	
25B	Room 224 - Receiving Area	Under Illuminance		236.13	
25B	Room 224 - Conference Room	Normal Illuminance		320.08	
25B	COE-EC (Room 322)	Under Illuminance	Under Illuminance	203.16	
25B	GSE Office (Room 323)	Normal Illuminance	Normal Illuminance	364.72	
25B	DMRET Faculty Office #1 (Room 324)	Under Illuminance	Under Illuminance	169.35	
25B	DMRET Faculty Office #2 (Room 326)	Under Illuminance		167.07	
25B	Library #1 (Room 422)	Under Illuminance	Under Illuminance	201.12	
25B	Library #2 (Room 424)	Under Illuminance		230.49	
25B	Library #3 (Room 424)	Under Illuminance		171.55	
25B	RICE Lab (Room 522)	Under Illuminance	Under Illuminance	279.41	
25B	Graduate Student Lounge (Room 524)	Normal Illuminance	Normal Illuminance	317.00	
25B	DMET Faculty Office (Room 526) #1	Under Illuminance	Under Illuminance	234.87	
25B	DMET Faculty Office (Room 526) #2	Under Illuminance		237.42	
25B	5F - RW (Male)	Under Illuminance	Under Illuminance	89.01	
25B	5F - RW (Female)				Locked



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
25C	CerE Laboratory Room (Room 115)	Under Illuminance	Under Illuminance	269.59	
25C	Room 116 & Room 118	Under Illuminance	Under Illuminance	84.17	
25C	MetE Laboratory Room (Room 117)	Under Illuminance	Under Illuminance	149.43	
25C	DMET Laboratory (Room 119)	Under Illuminance	Under Illuminance	81.08	
25C	Room 120	Under Illuminance	Under Illuminance	167.77	
25C	Room 121	Under Illuminance	Under Illuminance	288.96	
25C	RF Engineering Lab (Room 215)	Normal Illuminance	Normal Illuminance	355.76	
25C	Room 316	Under Illuminance	Under Illuminance	98.05	
25C	DEET EE/ComE Office (Room 317)	Under Illuminance	Under Illuminance	157.36	
25C	Room 318	Under Illuminance	Under Illuminance	93.85	
25C	DEET ECE Office (Room 319)	Under Illuminance	Under Illuminance	186.24	
25C	DOST Office (Room 321)	Normal Illuminance	Normal Illuminance	369.56	
25C	COET Conference Hall (Room 421) #1	Under Illuminance	Under Illuminance	182.57	
25C	COET Conference Hall (Room 421) #2	Under Illuminance		145.58	
25C	DCHET Unit Operations Lab #1 (Room 521)	Normal Illuminance	Normal Illuminance	449.99	
25C	Stockroom/Supervisor's Booth (Room 523)	Under Illuminance	Under Illuminance	182.76	
25C	Thesis Room/ Computer Lab (Room 525)	Normal Illuminance	Normal Illuminance	379.13	
25C	DCHET Unit Operations Lab #2 (Room 527)	Under Illuminance	Under Illuminance	247.25	
25C	3F - LW (Male)	Under Illuminance	Under Illuminance	68.61	
25C	3F - LW (Female)	Under Illuminance	Under Illuminance	72.70	
25C	4F - LW (Male)	Under Illuminance	Under Illuminance	54.27	
25C	4F - LW (Female)	Under Illuminance	Under Illuminance	51.47	
25C	5F - LW (Male)				Locked
25C	5F - LW (Female)				Locked

L. Temperature and Relative Humidity (inside and outside) of rooms in the selected buildings of MSU-IIT.

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
1	Cashing Division	23.84	65.29	25.37	89.10	21



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
1	IASU	22.45	52.94	24.63	89.73	17
1	Accounting Division	24.15	67.20	25.20	90.93	22
1	OGC	23.57	53.52	25.87	86.83	21
1	OIS	26.27	65.87	26.93	78.03	24
1	SDS	25.34	54.66	27.12	84.30	16
1	OVCSS	24.15	61.43	27.10	84.90	16
1	OVCAF	24.84	57.29	27.53	80.10	20
1	COA	25.71	58.05	27.13	82.93	25
2	OCS	24.61	71.19	26.47	86.63	24
2	OC	24.40	65.84	26.76	87.30	23
3	Office of Communication	25.52	56.25	27.43	83.13	17
5A	Registrar	25.11	57.78	27.60	86.37	21
5A	OVCSI	26.32	51.57	27.87	83.17	17
5A	HRM Laboratory	26.96	68.92	27.93	83.43	17
5B	OVCIA	24.92	63.56	27.30	85.90	20
5B	Legal Office	25.50	66.07	27.90	82.47	16
5B	HRMD	24.96	62.51	28.17	84.33	21
6	OASG	26.11	56.54	29.70	74.25	18
6	BMO	23.99	53.02	29.73	74.73	18
6	Minitheater	25.49	51.47	29.90	73.60	17
6	Main Library	26.07	57.31	27.83	79.43	17
6	OVCRE	24.69	60.03	27.92	81.68	17
6	OUR - Archives	25.71	58.35	28.27	78.73	18
7	SID	26.48	54.52	29.83	66.70	17
7	MCR	25.60	47.67	31.67	62.17	20
8	Langkit					
8	OVCPA					
8	KTTO					
14A	Marine Science Dept (Room 102 & 103)	26.05	61.97	29.83	72.59	22
14A	Room 104 (CSM Guidance Office)	29.19	67.88	29.03	79.00	No AC
14A	Room 105	27.20	65.99	29.07	83.87	18
14A	Room 106	26.11	56.37	29.17	83.80	22
14A	Room 108	24.98	51.68	29.80	81.30	21
14A	Room 109	26.58	64.07	29.33	80.43	16
14A	Room 110	26.49	58.98	28.73	77.73	20
14A	Room 111/112	27.22	60.42	28.90	77.13	16
14A	Room 113	27.21	61.79	27.83	79.90	24
14A	Room 114 (Dean's Office)	25.49	53.92	29.02	77.93	21
14A	Room 116	26.63	64.29	28.17	79.43	25
14A	Room 117	26.99	62.23	28.17	80.17	17
14A	SMAS	29.23	78.24	29.47	72.33	No AC
14A	Room 119	24.34	49.92	29.33	82.13	20
14A	Room 120	27.24	53.54	28.50	82.37	23
14A	Room 121	26.65	67.10	28.60	77.97	21
14A	Room 122 & 123	26.85	58.11	28.77	77.37	16
14A	Room 124	27.03	59.81	28.90	77.90	16
14A	Room 125	27.13	56.39	28.30	78.53	19





Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
14A	Room 127	26.11	56.05	28.30	78.57	16
14A	Room 128	26.61	64.60	28.30	77.57	19
14A	Room 129	26.74	66.27	28.47	77.90	25
14A	Room 130	28.05	49.09	28.30	80.83	17
14A	Room 131	25.79	50.78	28.27	81.07	22
14A	Room 132	26.27	60.61	29.03	78.57	23
14A	Room 133	26.81	51.69	28.90	79.23	24
14A	KMP	27.44	66.83	28.23	78.77	16
14A	CR Female	29.47	79.37	29.73	76.20	No AC
14A	Accreditation Room	25.56	59.13	29.33	78.63	19
14A	Room behind Accreditation Room	25.26	57.76	29.44	78.30	18
14A	Room 201	25.45	58.12	29.33	77.80	25
14A	Room 202	26.79	64.50	29.83	78.13	16
14A	Room 203	26.21	50.91	28.50	81.43	16
14A	Room 204	24.26	50.65	29.10	84.00	18
14A	Room 205	27.19	71.91	30.63	76.60	16
14A	Room 206	30.36	77.39	30.63	74.87	Not Functional
14A	Room 207	26.33	69.41	30.30	76.63	16
14A	Room 208	22.33	46.87	29.30	84.17	20
14A	Room 209	26.31	61.22	28.97	82.70	20
14A	Room 210B	24.15	44.45	29.27	84.17	20
14A	Room 211	29.59	77.21	30.47	75.60	No AC
14A	Room 212	29.81	79.25	30.63	80.13	Not Functional
14A	Room 213	29.33	71.76	29.80	79.43	Not Functional
14A	Room 214	29.21	77.39	29.77	78.73	Not Functional
14A	Room 215	29.32	77.57	29.30	78.73	Not Functional
14A	Room 216	28.22	69.25	29.63	77.07	26
14A	Room 217	27.13	51.37	28.80	78.90	16
14A	Room 218	27.95	62.03	28.80	79.13	26
14A	Dept of Math & Statistics (Room 219/220)	26.41	51.21	28.85	78.87	18
14A	Room 221A	25.97	51.37	29.63	78.60	23
14A	Room 221B	28.07	69.32	29.10	80.90	16
14A	Room 222	27.27	55.49	28.67	75.53	16
14A	Room 223	26.66	64.95	30.70	78.83	23
14A	Room 224	26.27	67.03	28.77	79.03	25
14A	Room 225	23.83	43.49	33.57	77.33	20
14A	Room 226	25.27	57.90	28.37	83.13	24
14A	Room 226A	25.42	44.14	30.17	79.47	18
14A	Room 228 - Main	26.03	57.71	30.17	75.03	16
14A	Room 228B	26.17	57.94	30.13	78.30	20
14A	Chemistry Department (Room 302)	27.53	65.03	29.07	81.42	16





Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
14A	Chemistry Department (Room 331)	26.57	45.65	29.17	79.23	25
14A	Room 306	26.73	48.52	29.00	81.90	16
14A	Instrument Room (Room 307)	29.67	76.93	30.60	76.10	No AC
14A	Room 308	31.23	75.08	30.40	74.63	No AC
14A	Room 309/Room 310	30.19	76.47	30.10	78.17	No AC
14A	Room 311	29.67	77.03	30.30	78.40	No AC
14A	Room 313	27.32	54.90	30.13	79.07	16
14A	Room 312	28.70	59.19	30.30	78.60	No AC
14A	Room 314	30.13	78.68	29.63	75.47	No AC
14A	Room 315	29.56	77.24	29.83	78.83	No AC
14A	Room 316	27.01	54.77	29.63	79.60	25
14A	Room 317	29.28	79.49	29.90	79.20	No AC
14A	Room 318	26.26	46.02	29.67	79.90	16
14A	Room 319	30.12	68.44	29.23	80.37	16
14A	CSM Library - Room 320/321/324	26.46	48.17	29.16	78.27	16
14A	Room 322	27.02	45.78	30.53	77.23	16
14A	Room 323	27.29	60.31	28.83	81.73	16
14A	Room 325&326	31.41	74.03	31.10	75.33	No AC
14A	Room 327&328	31.74	73.43	31.10	76.40	No AC
14A	Room 329	27.70	54.25	29.83	76.80	16
14A	Room 330	30.83	73.76	31.00	76.43	No AC
14A	Glass Room	29.01	77.87	29.13	79.03	No AC
14A	Museum	27.68	47.57	29.43	80.88	20
14B	LHA	26.83	54.70	29.20	81.27	17
14B	LHB	26.09	53.65	29.10	80.70	25
14B	LHC	26.09	55.73	29.13	81.67	17
14B	Graduate Lounge	27.71	76.37	29.37	77.73	25
14B	CR - Male	28.94	81.89	28.97	83.90	No AC
14B	CR - Female	28.93	82.36	29.03	81.80	No AC
14B	Chemical Room	26.83	57.65	29.53	81.13	17
14B	GL1	26.31	58.53	29.27	80.83	16
14B	GL2	26.53	63.71	29.43	81.27	20
14B	Room 230	25.02	47.91	29.17	80.97	18
14B	Room 231	27.93	80.97	28.37	83.10	No AC
14B	Room 232	26.94	66.27	29.70	80.27	21
14B	CR Female	30.33	79.53	29.77	78.13	No AC
14B	Room 332	29.87	74.56	29.60	77.70	No AC
14B	Room 333	26.43	58.53	28.13	81.83	24
14B	Room 334	25.97	49.44	28.10	82.70	23
14B	Room 335 - A	27.42	44.79	30.72	74.53	19
14B	Room 336	30.89	71.69	30.87	73.33	No AC
14B	CR near 336	30.72	75.58	30.80	74.07	No AC
14B	Room 337	29.63	75.99	29.60	77.70	No AC
14B	Room 338	26.31	48.97	29.03	80.00	16
14B	Room 339	27.25	51.39	29.27	77.60	17
14B	CR Beside Room 339	29.89	77.07	29.62	77.40	No AC
14B	Asceptic Room	29.68	73.45	29.97	75.53	AC Off



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
14B	CR - F	30.47	75.20	29.73	76.23	No AC
14B	Marine Museum	25.91	51.37	28.47	79.03	19
19A	Room 107	26.21	47.96	28.53	68.63	18
19A	Room 108	26.07	61.46	28.37	79.47	18
19A	Room 109	25.69	70.91	30.47	67.43	18
19A	Room 110	25.21	47.53	28.13	76.07	18
19A	Room 111	26.30	63.89	28.03	79.57	18
19A	Room 112	25.50	50.79	28.77	78.47	18
19A	Room 113	26.41	64.05	28.80	78.43	18
19A	Room 114	25.41	49.29	28.70	74.47	18
19A	Room 115	25.29	49.69	29.00	76.67	18
19A	Room 116	26.23	62.87	28.57	77.63	18
19A	Room 117	25.29	50.29	28.90	77.33	18
19A	Room 118	25.14	49.74	28.97	76.80	18
19A	Room 119	25.14	49.97	28.70	77.67	18
19A	Room 120	25.25	70.97	30.30	66.00	18
19A	Room 121	25.69	63.27	30.83	65.40	18
19A	Department of Psychology	24.98	53.71	29.80	64.90	20
19A	CASS EC	27.32	60.10	29.90	66.13	20
19A	CASS Library	26.71	51.80	29.90	66.20	20
19A	SIS	24.82	57.11	28.67	71.40	20
19A	CASS Guidance Office	27.26	83.03	28.40	77.37	21
19A	Department of History	27.12	49.70	28.42	68.67	20
19A	History Library	27.57	58.35	29.60	61.90	24
19A	Sociology Department	27.18	54.62	29.87	74.00	22
19A	Room 208	25.05	53.95	30.83	64.67	18
19A	Room 209	25.11	49.08	30.23	65.13	18
19A	Room 210	25.31	51.50	30.83	65.93	18
19A	Room 211	27.55	65.15	29.10	69.97	18
19A	Room 212	27.54	62.96	29.80	71.07	18
19A	Room 213	27.39	60.57	30.30	65.81	18
19A	Room 214	27.91	60.84	29.57	71.20	18
19A	Room 215	27.45	59.09	28.57	73.37	18
19A	Room 216	24.62	49.46	30.43	63.27	18
19A	Room 217	24.30	39.83	30.00	72.80	18
19A	Room 218	25.07	48.31	31.47	66.00	18
19A	Room 219	27.32	64.56	29.10	73.47	18
19A	Room 220	26.67	52.44	32.93	62.80	18
19A	Room 221	25.49	47.39	32.67	61.83	18
19A	Room 222	26.23	52.11	31.93	65.27	18
19A	Room 301	28.65	59.69	29.97	74.57	AC Off
19A	Room 302	29.28	67.20	29.60	71.37	AC Off
19A	Room 305	27.77	45.08	29.73	74.37	AC Off
19A	Room 306	31.15	64.54	31.33	69.83	AC Off
19A	Computer Laboratory	24.54	54.80	28.33	72.73	AC Off
19A	College of Law Library	25.29	49.36	29.17	73.60	20



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
19A	Kalimulan	27.44	44.45	30.73	77.13	24
19A	College of Law	25.34	53.21	29.17	73.60	20
19A	Octava Office	27.94	55.97	29.47	74.73	24
19A	Multimedia Room (Octava)	27.91	54.28	29.97	71.47	No AC
19B	A11 (Dean's Office)	26.06	62.51	29.80	71.37	20
19B	A12 (Faculty Lounge)	26.60	63.24	28.39	78.07	20
19B	B21 (English Department)	26.13	57.72	28.37	74.46	20
19B	B22 - Langkit Office	25.59	67.75	28.70	75.63	20
19B	B23 (Mini Leaning Commons)	26.11	71.29	28.70	75.63	20
19B	C31 (Department of Filipino and Other Languages)	24.68	60.00	29.17	77.87	20
19B	C32 Department of Philosophy and Humanities	24.35	61.80	27.83	75.17	20
19B	D42 (CASS Research Centers)	25.86	67.66	30.80	67.90	20
19B	D42 (CASS Research Centers) - D43	24.63	66.14	30.80	67.90	20
19B	D42 (CASS Research Centers) - D44	26.20	62.31	30.80	67.90	20
19B	D42 (CASS Research Centers) - D45	26.05	65.33	29.40	79.60	20
19B	D42 (CASS Research Centers) - D46	26.02	63.48	30.07	73.53	20
19B	Political Science Department	25.55	58.94	29.36	73.84	20
19B	E53	25.71	59.27	27.93	77.80	20
19B	E52 & E54	25.51	61.87	28.23	77.37	20
19B	E51 & E55	25.89	62.60	28.83	75.77	20
19B	E56 & E57	25.48	61.89	28.30	73.33	20
25A	Room 101	26.52	65.54	28.40	77.60	24
25A	Room 102	26.02	49.99	28.70	73.03	16
25A	Room 103 (Valcree)	26.28	53.65	28.43	78.17	16
25A	Room 104 (Mechanical Lab)	27.41	68.01	28.40	77.60	25
25A	Room 105	26.54	50.13	28.73	78.23	20
25A	Room 106	26.14	55.31	28.37	82.50	24
25A	Energy Conversion Lab (Room 107)	26.54	58.79	28.53	74.20	Not Functional
25A	Room 108	26.22	48.03	28.53	78.17	16
25A	GIS Resource Center (Room 109)	25.76	55.45	28.53	74.20	17
25A	Room 110	26.95	66.30	28.73	78.23	17



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
25A	DMRET Stockroom (Room 111 A&B)	27.39	65.13	28.07	78.63	17
25A	DOST/MIDSA	26.63	62.42	28.80	72.97	18
25A	Room 112	26.53	55.43	28.67	73.73	24
25A	Room 113A	28.90	74.72	28.07	78.63	No AC
25A	Room 113B	28.71	75.35	28.57	77.17	No AC
25A	Room 114	29.62	76.55	28.53	77.60	No AC
25A	Room 1 (Room 201)	26.95	57.19	28.93	76.23	24
25A	Room 9 (Room 202)	27.09	56.51	28.70	72.53	28
25A	Room 2 (Room 203)	27.67	62.29	29.00	76.57	25
25A	Room 10 (Room 204)	26.45	53.38	29.10	75.30	17
25A	Room 3 (Room 205A/B)	28.55	70.99	29.10	79.93	No AC
25A	Room 11 (Room 206)	30.01	69.99	29.03	76.80	17
25A	Room 207	26.59	62.89	28.23	75.37	18
25A	Room 12 (Room 208)	29.23	73.43	29.00	75.93	Not Functional
25A	Room 209 A/B	25.78	48.63	26.90	80.20	24
25A	Room 209 C	25.78	47.25	26.97	79.47	25
25A	Room 210	26.18	54.99	28.40	71.07	17
25A	Room 211	26.35	56.03	28.30	80.17	21
25A	Room 212	28.72	68.57	28.63	76.23	20
25A	Room 213	25.18	43.69	28.07	73.63	22
25A	Room 214 A	24.77	51.09	26.60	80.33	20
25A	Room 214 B	23.88	51.55	26.60	80.63	19
25A	Room 13C (Room 214C)	27.47	58.19	28.83	77.17	17
25A	2F - CR Male	29.31	81.77	29.60	78.97	No AC
25A	2F - CR Female	29.44	81.01	27.80	78.83	No AC
25A	MetE Grad/Proj Room (Room 301)	26.05	51.31	28.63	74.50	16
25A	Room 302 A/B	29.10	57.29	30.13	64.77	25
25A	Guidance Office (Room 303)	28.79	74.91	30.27	76.07	No AC
25A	Room 304	28.97	53.86	29.97	65.33	25
25A	DMET Comp Room (Room 305)	26.69	51.93	29.60	75.83	17
25A	Room 306 A/B	29.63	60.52	29.97	60.57	25
25A	Room 308 A/B	34.25	64.91	30.97	66.10	25
25A	DCHET Lab (Creencia) (Room 309)	28.05	56.75	30.00	69.77	22
25A	Room 310 A/B	29.91	55.23	31.03	65.07	25
25A	Room 312	30.34	61.24	30.70	60.73	25
25A	DMRET - Lazer/EM Comp Room (Room 311)	26.66	44.20	29.30	75.50	17
25A	Room 314	31.77	59.93	30.30	66.30	25
25B	Fablab (Room 122/124)	25.30	58.64	28.13	77.37	18



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
25B	DMET (Fluid Science Lab) (Room 126)	27.83	82.23	28.80	83.07	No AC
25B	CREATE Lab	27.73	68.50	28.33	78.13	23
25B	Room 224 - Dean's Office	23.98	65.69	26.37	81.50	22
25B	DOST Office (Room 321)	24.94	56.14	29.67	79.83	20
25B	COE-EC (Room 322)	27.83	70.12	30.03	79.40	17
25B	GSE Office (Room 323)	26.37	52.06	29.87	72.73	23
25B	DMRET Faculty Office (Room 324/326)	24.81	53.96	29.23	81.37	17
25B	COE Library	27.08	60.66	30.05	75.67	21
25B	RICE Lab (Room 522)	27.37	55.15	29.70	75.50	23
25B	Graduate Student Lounge (Room 524)	28.74	56.93	29.23	78.07	25
25B	DMET Faculty Office (Room 526)	27.66	50.61	31.07	71.63	25
25B	5F - RW (Male)	31.03	71.55	31.13	71.33	No AC
25B	5F - RW (Female)	31.01	72.04	31.13	71.33	No AC
25C	CerE Laboratory Room (Room 115)	29.08	74.16	39.87	72.33	AC Off
25C	Room 116 & Room 118	28.82	75.18	28.07	78.63	No AC
25C	MetE Laboratory Room (Room 117)	27.93	69.56	29.67	71.60	AC Off
25C	DMET Laboratory (Room 119)	28.73	75.63	29.67	73.00	AC Off
25C	Room 120	27.24	74.42	28.57	77.17	24
25C	Room 121	24.83	46.34	29.23	69.90	22
25C	RF Engineering Lab (Room 215)	26.05	26.05	26.05	26.05	26
25C	Room 316	29.45	52.22	30.20	67.30	25
25C	DEET EE/ComE Office (Room 317)	26.81	49.48	30.53	69.07	24
25C	Room 318	28.90	50.74	29.60	65.53	25
25C	DEET ECE Office (Room 319)	26.57	51.38	30.53	68.87	23
25C	COET Conference Hall (Room 421)	29.98	65.29	30.03	75.20	21
25C	DCHET Unit					
25C	Operations Lab #1 (Room 521)	27.89	44.22	31.20	71.60	18
25C	Stockroom/Supervisor's Booth (Room 523)	29.53	43.61	31.33	70.40	AC Off
25C	Thesis Room/Computer Lab (Room 525)	26.44	47.79	30.97	70.53	18



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
	DCHET Unit					
25C	Operations Lab #2 (Room 527)	29.63	70.03	29.63	76.03	No AC
25C	3F - LW (Male)	30.15	79.35	30.27	79.23	No AC
25C	3F - LW (Female)	29.98	79.97	30.33	79.17	No AC
25C	4F - LW (Male)	29.43	74.74	29.83	73.50	No AC
25C	4F - LW (Female)	29.69	73.85	29.83	73.87	No AC
25C	5F - LW (Male)	31.35	71.62	31.73	69.53	No AC
25C	5F - LW (Female)	31.39	72.00	31.70	69.90	No AC
	<b>Average (w/ &amp;w/o AC's)</b>	27.06	60.73	29.27	76.14	20
	<b>Average (w/ ACs only)</b>	26.38	57.26	29.06	76.12	20



## Certification of Progress Report

4<sup>th</sup> Quarter (2024)

### Energy and Greenhouse Gas Auditing of MSU-IIT Buildings

This is to certify that the progress report for the project titled “**Energy and Greenhouse Gas Auditing of MSU-IIT Buildings**” has been duly prepared and reviewed as of January 15, 2025. The report outlines the significant milestones achieved, the current status of ongoing activities, and the planned future steps necessary to complete the project successfully.

This certification acknowledges the dedicated efforts of the project team and their commitment to achieving the project objectives.

A handwritten signature in black ink, appearing to read 'H. Bacosa', is positioned above the name of the Project Leader.

**HERNANDO P. BACOSA, PhD**  
**Project Leader**

January 15, 2025  
Date

**Department of Research**  
**QUARTERLY PROGRESS REPORT (Form 2)**

**For the Period: March 1, 2024 to December 31, 2024 of 4<sup>th</sup> Quarter (Inclusive Dates October 1, 2024 to December 31, 2024)**

**PROGRAM TITLE: Energy and Greenhouse Gas Auditing of MSU-IIT Buildings**

**PROJECT TITLE/DURATION: 10 Months**

**PROJECT LEADER: HERNANDO P. BACOSA, PhD**

TARGET ACTIVITIES FOR THE PERIOD (BASED ON APPROVED PROPOSAL)	ACTUAL ACCOMPLISHMENT	PERCENTAGE ACCOMPLISHMENT		PROJECT EXPENDITURES FOR THE PERIOD	REMARKS
		FOR THE PERIOD	CUMMULATIVE START (FROM START)		
Rapid Building Assessment	Initial identification and mapping of the buildings that are selected in the rapid energy audit	100%	100%	-	The rapid building assessment commenced.
Purchase and Preparation of Materials	Equipment purchase request is on-going	100%	100%	15,000	The purchase request was granted, received, and used in the field survey.
Hiring and Deployment of Research Assistant	The research assistant was hired and is currently working.	100%	100%	30,403.20	Utilized salary allocation
Hiring and Deployment of Field Assistant	The research assistant was hired and is currently working.	100%	100%	14,104.38	Utilized salary allocation
Rapid Diagnostic Energy Audit	The rapid diagnostic energy audit was performed at the selected buildings	100%	100%	-	Inventory and analysis was done



Comprehensive Diagnostic Energy Audit		Comprehensive energy audit was performed in the administration buildings No. 1, 2, 3 5-A, 5-B, 7-A, 14-A, 14-B, 19-A, 19-B, 25-A, 25-B and 25-C				
Building Name	Building No.					
Administration	1	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
Office of the Chancellor	2	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
Office of Communications	3	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
OVCSI/Registrar	5-A	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
OVCIA/Legal Office	5-B	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
Main Library	6	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
MCR/SID	7-A	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
KTTO	8	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
CSM-MAIN	14-A	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
CSM-ANNEX	14-B	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
CASS-A	19-A	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done

CASS-B	19-B	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
COE-A	25-A	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
COE-B	25-B	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done
COE-C	25-C	Inventory/Diagnostic Energy Audit; Illuminance Test; Humidity Test	100%	100%	-	Inventory and analysis was done

**I CERTIFY, ON MY HONOR, TO THE CORRECTNESS OF THE ABOVE INFORMATION**



**HERNANDO P. BACOSA, PhD**  
Project Leader

**Date: 01/15/2025**

**Noted:**

**EPHRIME B. METILLO, PhD**  
Vice Chancellor for Research and Enterprise

**Date**

**NOTE:**

Upload accomplished form to REIS together with Form 1.