



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

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

Period Covered: **March 1, 2024 to December 31, 2024**

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

## **TERMINAL REPORT**

### **I. Brief Summary/Abstract**

The Mindanao State University – Iligan Institute of Technology (MSU-IIT) in Northern Mindanao supports the Sustainable Development Goals (SDGs). The university focuses on climate change and energy efficiency, which relates to SDGs 7 and 13. As the country works towards energy sustainability, the university aims to provide affordable, reliable, sustainable, and modern energy.

Over the past decade, MSU-IIT has used a lot of electricity. This high electricity usage affects the university's finances and the environment. It leads to higher operating costs and increased utility bills, which can limit funds for important areas like academic programs, research, and student services. Additionally, using large amounts of electricity contributes to local air pollution and resource depletion.

This study presents the first phase of energy audit procedures at MSU-IIT. Its objectives are (1) to carry out a detailed energy audit of selected buildings, (2) to perform a static illuminance test in those buildings, (3) to conduct temperature and humidity tests in each room, and (4) to evaluate MSU-IIT students' views and awareness of energy consumption on campus.



The results of this study reveal that academic buildings consume significantly more energy than other buildings included in the study. Among the academic buildings, the College of Science and Mathematics (CSM) - Main building was identified as the largest emitter of energy and greenhouse gas emissions. The diagnostic energy audit indicated that Heating, Ventilation, and Air Conditioning (HVAC) units were key contributors to electricity usage and greenhouse gas emissions. The overall illuminance levels in the rooms under the selected buildings were identified as under illuminance. Only 12% of those rooms/offices successfully met the requirements of the Department of Energy (DOE) 2020 Guidelines, which underscores a critical need for improvement in compliance and efficiency. Seventy percent of the rooms with air-conditioning units maintained an acceptable indoor temperature; however, only 43% reached the recommended relative humidity levels according to the 2020 DOE guidelines. The survey revealed that students are generally well-informed about the institute's energy conservation policies. They expressed a positive attitude toward supporting and participating in energy conservation initiatives on campus. However, it was noted that 63% of the students preferred setting air-conditioning units to low-temperature levels (below 21°C). This finding aligns with the indoor temperature test results, which indicated that the average temperature setting for HVAC units across all rooms was 20°C. Overall, these results underscore the importance of regular maintenance of HVAC units, replacing lighting systems with alternatives that maintain the same wattage but offer improved light output, and promoting energy-efficient practices to further reduce energy consumption at the university.



## II. Introduction and Objectives

The Philippines has set ambitious goals to increase the share of renewable energy and improve efficiency in the nation's energy mix (Aleluia et al., 2022). In 2019, the government enacted Republic Act No. 11285 (Energy Efficiency and Conservation Act), which aims to implement energy efficiency and conservation measures, optimize energy utilization, and provide incentives for related initiatives. Concurrently, the Department of Energy (DOE) developed a National Energy Efficiency and Conservation Plan and Roadmap (2023-2050), which outlines updated strategic plans and actions for energy efficiency compliance (EEC) across all sectors in the Philippines (Philippine Energy Plan, 2019). In accordance with the Paris Agreement, the country aims to achieve a reduction in greenhouse gas (GHG) emissions by 75% by 2030 (Lavasa, 2015). Within the Ambisyon Natin 2040 framework, the Philippines is dedicated to achieving pertinent, inclusive, and sustainable economic growth, with a particular emphasis placed on the prioritization of educational services among its key objectives. The realization of these

goals hinges on the active participation of all sectors, particularly the significant contributions from 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 (Kharti, 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, (3) to conduct temperature and humidity test on each rooms of the buildings and (4) to assess the behavior, perception and awareness of MSU-IIT students on energy consumption in MSU-IIT. 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.



### III. Materials and Methods

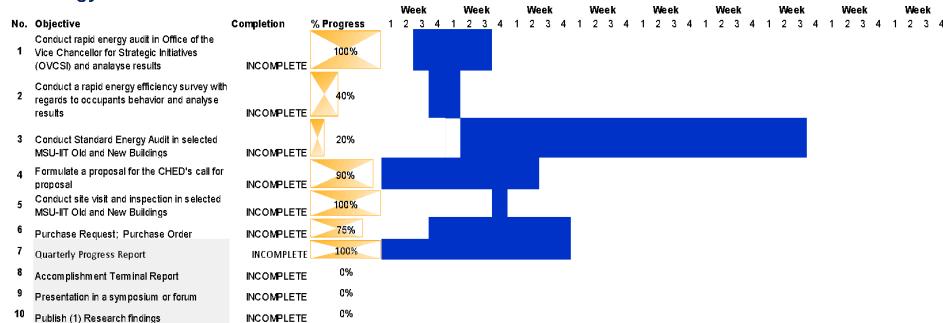
This project's method is effectively implemented using a Project Management Tracker that is currently developing. Fig. 1 depicts an example of the tracker. Meanwhile, this paper's Sections 2.1 and 2.2 to 2.5 corresponds to Project Management and Methods employed, respectively, throughout the energy audit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

A

ENERGY AUDIT PROJECT MANAGEMENT TRACKER								
Building No.	Activity	Time Frame		Success Criteria	Activity	Contribution	Started	Ended
		Date Start	Date Due	% Progress				
5	Standard Energy Audit at OVCSt Main	Apr 22, 24	Apr 24/2024	100%	Conduct of Survey	100%	April 22, 2024	April 26, 2024
					Consolidation and Validation of Results	100%	April 23, 2024	May 7, 2024
					Calculation	100%	May 6, 2024	May 24, 2024
					Analysis	100%	May 26, 2024	
7	Standard Energy Audit at MCR	Apr 22, 24	Apr 26, 24	100%	Conduct of Survey	100%	April 27, 2024	April 27, 2025
					Consolidation and Validation of Results	100%	April 29, 2024	May 7, 2024
					Calculation	100%	May 6, 2024	May 24, 2024
					Analysis	100%	May 26, 2024	
5	Luminance Test at OVCSt Main	Apr 23, 24	Apr 26, 24	100%	Conduct of Survey	100%	May 6, 2024	May 9, 2024
					Consolidation and Validation of Results	100%	April 29, 2024	May 7, 2024
					Calculation	100%	May 6, 2024	May 24, 2024
					Analysis	100%	May 26, 2024	
7	Luminance Test at MCR	Apr 1, 24	Jun 14, 24	100%	Conduct of Survey	100%	May 10, 2024	May 10, 2024
					Consolidation and Validation of Results	100%	April 29, 2024	May 7, 2024
					Calculation	100%	May 6, 2024	May 24, 2024
					Analysis	100%	May 26, 2024	

B

Energy Audit Gantt Chart



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

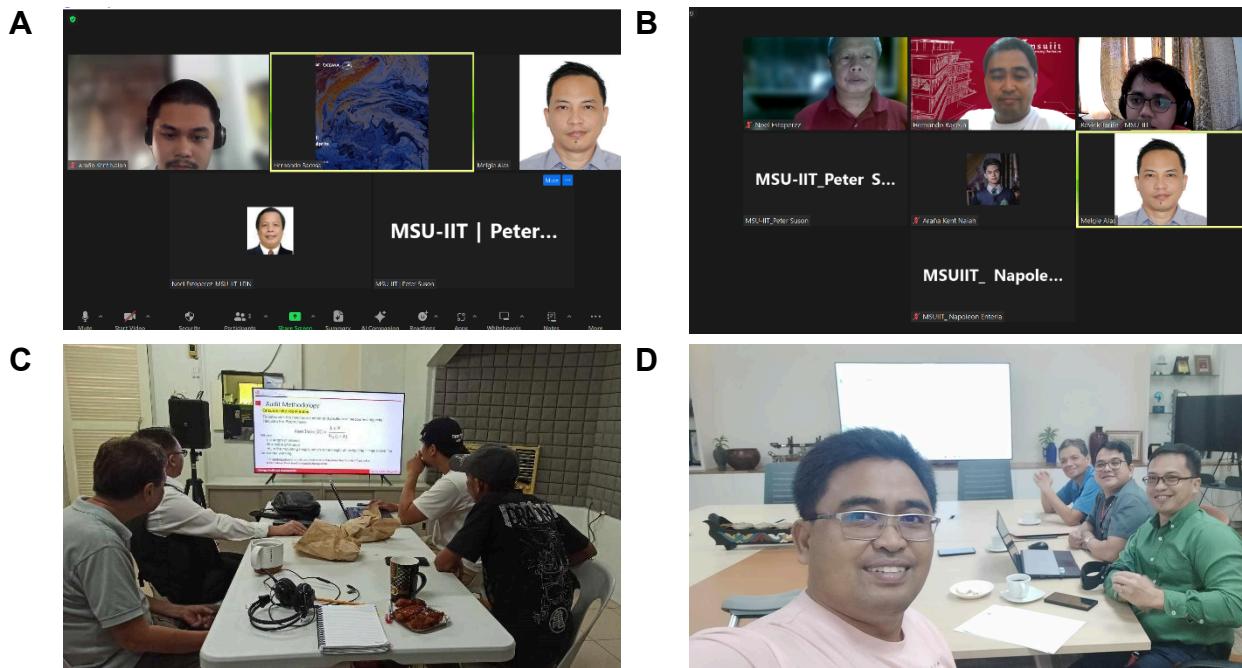
#### 2.1 Energy audit and greenhouse gas auditing project management

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



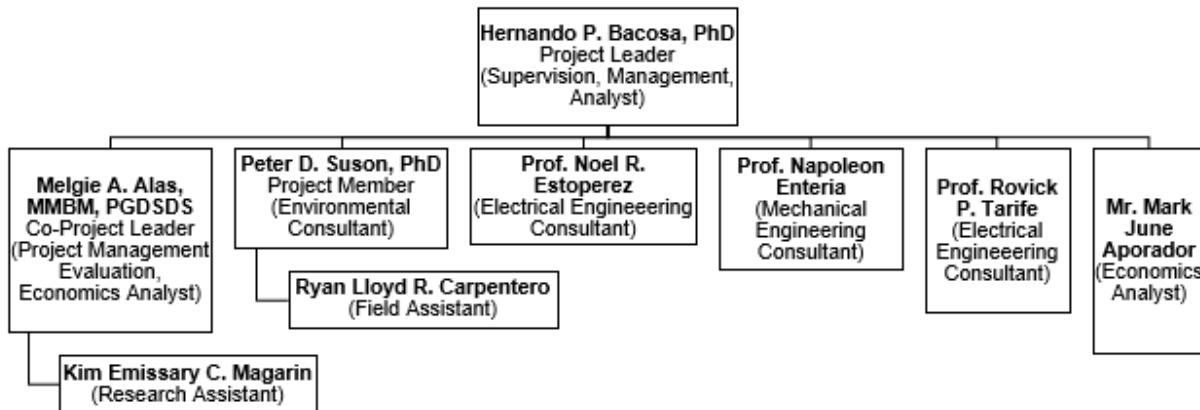
is held every Monday of the week from 1:30-2:30 p.m. These activities are justified in

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 chart 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 chart.

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 (Phase 1).

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 (OVCIA)/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. Initially, a diagnostic energy audit helps determine major energy-consuming equipment and areas where energy is 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 (Kharti, 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, poorly fit windows, and missing pipe insulation. It is very important to understand the existing situation before attempting improvements; otherwise, corrective efforts could be misdirected, ineffective, and 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 and identifying the specific areas and systems to be examined. This includes understanding the building's layout, usage patterns, and equipment and systems installed. If available, gathering existing energy bills, equipment manuals, and previous audit reports helps establish a baseline for the audit. Proper preparation lays the foundation for a systematic and practical 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 each piece of equipment's type, age, condition, and operating schedules. 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**

To calculate the amount of energy used from the diagnostic energy audit, the following equations below are used:

$$\text{Energy Consumption (kWh)} = \text{Kilowatt (kW) of Equipment} \times \text{Daily Consumption (hrs)} \quad (1)$$

The energy cost is derived from the energy consumption of equipment. It is then multiplied by the local average electricity rate of Iligan Light Power Incorporated (a local electricity utility company), which is ₱12/kWh.

$$\text{Energy Cost (₱)} = \text{Energy Consumption (kWh)} \times ₱12/\text{kWh} \quad (2)$$

From the energy consumption of the equipment that was collected, the equivalent greenhouse gas (GHG) emissions can now be derived using the following equation.

$$\text{GHG Emissions (kg CO}_2\text{)} = \text{Energy Consumption (kWh)} \times \text{Emission Factor} \quad (3)$$

$$\text{GHG Emissions (ppm)} = \frac{\text{GHG Emissions (kg CO}_2\text{)}}{2,129,700 \text{ kg CO}_2/\text{ppm}} \quad (4)$$



where Emission Factor = 0.5555 (according to DOE Power Statistics, 2017), where 2,129,700 kg CO<sub>2</sub> corresponds to the mass of CO<sub>2</sub> to 1 ppm using the mass of the Earth's atmosphere at  $5.1 \times 10^{18}$  kg (Trenberth & Guillemot, 1994) and the current concentration of CO<sub>2</sub> in the atmosphere is approximately 417 ppm (NOAA, 2022).

### **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. The floor plan



of the buildings was used to determine the measurement points for the illuminance test.

Room Index was applied and shown in equation 5:

$$\text{Room Index (RI)} = \frac{L \times W}{H_m(L + W)} \quad (5)$$

where L = length of interior

W = width of interior

H<sub>m</sub> = the mounting height, which is the height of the lighting fittings above  
the horizontal working

#### **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 verify 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 Temperature and Humidity Test**

### **2.5.1 Preparation and Planning**

Conducting temperature and humidity tests in buildings requires careful preparation and planning to ensure accurate and meaningful results. The first step is determining the specific areas and conditions to test. This involves identifying spaces 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 obtain 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 the readings are reliable and reflect 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. The sensors were placed in five areas of the room: at four corners and one at the center. This is to ensure that the room temperature and relative humidity that was collected represent the entire room.

#### **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 help visualize sensor placements and test conditions. A comprehensive report summarizing the findings and 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.

## **2.6 Survey on Awareness, Perception, and Behavior of MSU-IIT Students to Energy Conservation Policies in MSU-IIT**

### **2.6.1 Respondents**

The students of MSU-IIT were the target participants of the survey to determine their level of awareness, behavior, and perception towards energy efficiency in the university. Stratified random sampling was applied in this study. It has an estimated student population of 13,273. There were 432 respondents, each representing their department under eight different colleges.

### **2.6.2 Measure/Instruments**



This study applied a survey questionnaire, administered both in “pen and paper” and online, to assess the students’ behaviors and attitudes towards energy efficiency. The first component of the survey collected sociodemographic information, including the respondent’s name (optional), college and their department, gender, civil status, highest educational attainment, age, and monthly income.

The second component of the questionnaire was the behavior practices of the usage of Heating, Ventilation, and Air Conditioning (HVAC) units, which aims to assess their practices on using the HVAC units. This part of the questionnaire had two subcomponents where the first half consists of the specific time of use of the HVAC units, its duration, and temperatures. The second half contains a five-point Likert scale that aims to measure the level of behavioral practices of the respondents to energy efficiency and HVAC units. (Never = 5, Rarely = 4, Sometimes = 3, Often = 2, Always = 1). The internal consistency of the behavior scale was favorable, with Cronbach’s alpha value at 0.81.

The third component is the five-point Likert scale that aims to assess the respondent’s attitude toward energy efficiency and their willingness. (Strongly disagree = 5, Disagree = 4, Neutral = 3, Agree = 2, Strongly Agree = 1).

### **2.6.3 Data Analysis**

The collected data were tabulated and analyzed using Jamovi ver. 2.16.17, which is an open-source statistical software. The frequency and distribution of the socio



demographic of the respondents were calculated using descriptive statistics (frequency, mean, median and percentage). In addition, the reliability of the questionnaire was calculated using Cronbach's alpha. Chi-square was applied to determine the strength of relationship between behavioral practices (towards energy usage and institute policies), attitude and awareness of institute policies. In addition, One-Way ANOVA/Kruskal-Wallis was applied to assess if there are significant differences of sociodemographic variables to behavioral practices, attitude and awareness. Also, Chi-square analysis was employed to measure the difference between student's demographics and their behavior/practices towards HVAC usage and energy consumption.

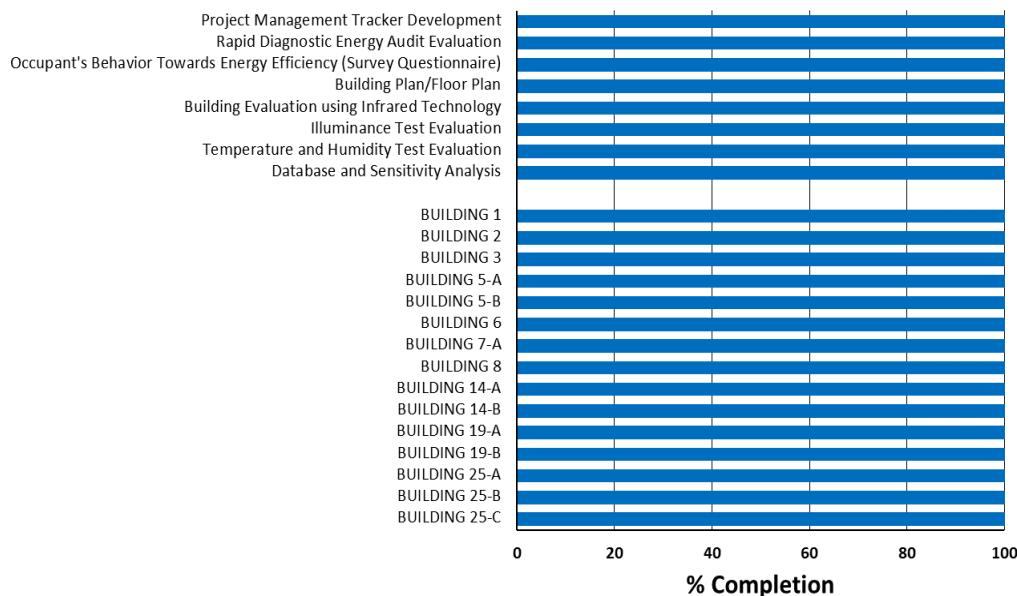


## IV. Results and Discussions

Section 3.1 outlines the detailed timeline and activities of this project, including completed, ongoing, and upcoming tasks. Meanwhile, Sections 3.2, 3.3, and 3.4 present the preliminary results and analysis from the energy audit conducted between October and December 2024.

### 3.1 Project's activities

Figure 5 illustrates the projected activities for this project based on its objectives, highlighting significant progress throughout its duration. All data collection and analysis for this project have been completed.



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



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

The findings from the rapid diagnostic energy audit conducted on all 15 buildings at MSU-IIT are detailed in Table 2. Figure 6 highlights the hotspots within these buildings, pinpointing the primary areas responsible for elevated energy consumption.

**Table 2.** Energy consumption calculated for selected MSU-IIT buildings by day, month, and year.

<b>Building No.</b>	<b>Total kilowatts</b>	<b>Energy Consumed (kwh)</b>		
		<b>Day</b>	<b>Month</b>	<b>Year</b>
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 - OVCIA/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



<b>Building No.</b>	<b>Total kilowatts</b>	<b>Energy Consumed (kwh)</b>		
		<b>Day</b>	<b>Month</b>	<b>Year</b>
<b>25C - COE (Left Wing)</b>	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>

**Table 3.** Energy costs (in pesos) for selected MSU-IIT buildings by day, month, and year.

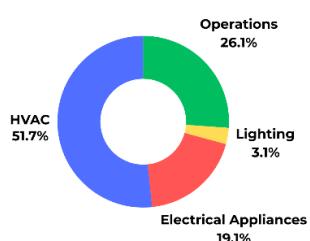
<b>Building No.</b>	<b>Energy Cost (in pesos)</b>		
	<b>Day</b>	<b>Month</b>	<b>Year</b>
<b>1 - Admin Building</b>	8,318.28	180,057.60	2,160,691.80
<b>2 - Office of the Chancellor</b>	3,228.48	72,132.84	864,633.12
<b>3 - Office of Communications</b>	475.92	10,290.24	123,483.36
<b>5A - OVCSI/Registrar/IDS Library/HRM Laboratory</b>	7,092.96	146,697.36	1,760,368.92
<b>5B - OVCIA/Legal Office/HRMD</b>	1,771.44	39,190.20	470,280.60
<b>6 - Main Library</b>	8,859.34	190,616.16	2,287,392.72
<b>7 - MCR/SID</b>	1,301.76	28,409.28	340,910.28
<b>8 - KTTO</b>	1,865.52	38,526.00	462,311.28
<b>14A - CSM (Main Building)</b>	30,562.15	620,968.97	7,451,627.59
<b>14B - CSM (Annex)</b>	11,166.92	238,259.46	2,857,913.47
<b>19A - CASS (Old Building)</b>	12,857.88	262,743.24	3,152,919.72
<b>19B - CASS (New Building)</b>	19,671.36	410,487.00	4,925,843.40
<b>25A - COE (Main Building)</b>	20,654.50	388,751.36	4,665,016.34
<b>25B - COE (Right Wing)</b>	6,134.33	119,233.98	1,430,807.73



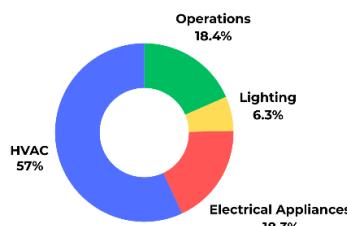
Building No.	Energy Cost (in pesos)		
	Day	Month	Year
25C - COE (Left Wing)	6,758.56	119,929.37	1,439,152.41
<b>Total</b>	<b>127,826.51</b>	<b>2,627,129.70</b>	<b>31,523,392.61</b>



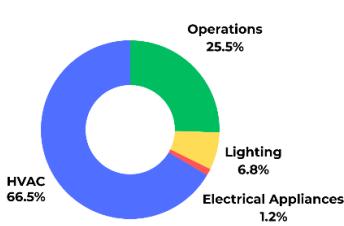
1 - ADMIN BUILDING



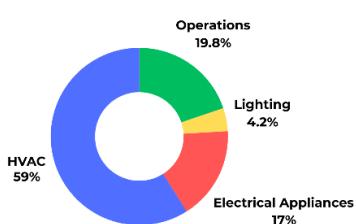
2 - OFFICE OF THE CHANCELLOR



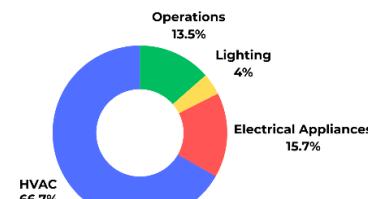
3 - OFFICE OF COMMUNICATIONS



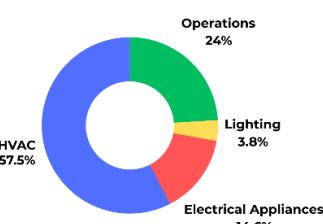
5A - OVCSI/REGISTRAR/IDS LIBRARY/  
HRM LABORATORY



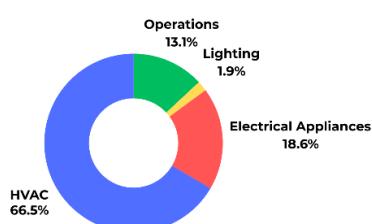
5B - OVCIA/LEGAL OFFICE/HRMD



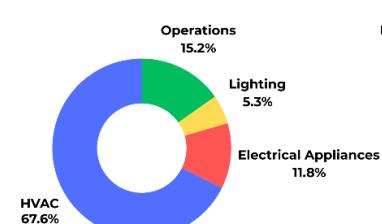
6 - MAIN LIBRARY



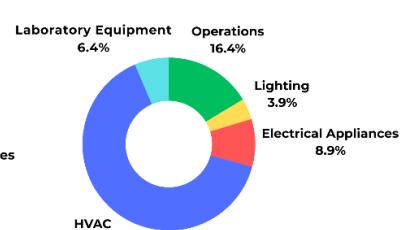
7 - MCR/SID



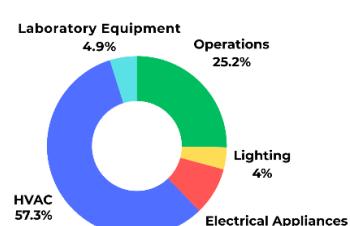
8 - KTTO



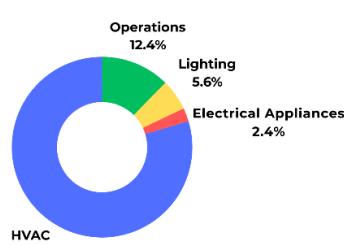
14A - CSM (MAIN BUILDING)



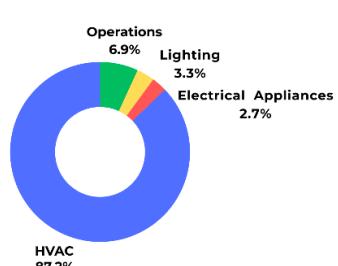
14B - CSM (ANNEX BUILDING)



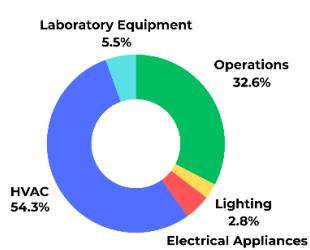
19A - CASS (OLD BUILDING)



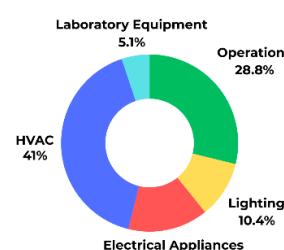
19B - CASS (NEW BUILDING)



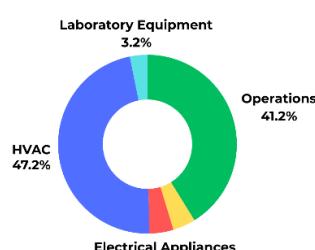
25A - COE (MAIN BUILDING)



25B - COE (RIGHT WING BUILDING)



25C - COE (LEFT WING BUILDING)





**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.

The audit revealed that Academic buildings such as CSM – Main Building, CASS – New Building, and COE – Main Building recorded the highest monthly energy consumption, with 52,784.13 kWh, 44,934.07 kWh, and 33,984.97 kWh respectively (Table 2). Among administrative buildings, the Main Library and Admin Building had significant electrical consumption, with monthly figures of 15,946.09 kWh and 15,004.80 kWh, respectively. HVAC systems emerged as the largest contributors to energy consumption across all buildings. The corresponding energy consumption costs from the diagnostic energy audit are detailed in Table 3. These results highlight areas of high energy usage and potential opportunities for energy efficiency improvements.

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

<b>Equipment</b>	<b>Building No.</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>
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>	<b>769</b>	<b>236</b>	<b>60</b>	<b>541</b>	<b>156</b>	<b>670</b>	<b>89</b>	
<b>Equipment</b>	<b>14A</b>	<b>14B</b>	<b>19A</b>	<b>19B</b>	<b>25A</b>	<b>25B</b>	<b>25C</b>	
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>	<b>2248</b>	<b>523</b>	<b>1003</b>	<b>1300</b>	<b>1285</b>	<b>799</b>	<b>625</b>	

**Table 5.** Summary of non-functional equipment of each building



<b>Equipment</b>	<b>Building No.</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>
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>	<b>55</b>	<b>13</b>	<b>3</b>	<b>61</b>	<b>4</b>	<b>62</b>	<b>16</b>	<b>12</b>
<b>Equipment</b>	<b>14A</b>	<b>14B</b>	<b>19A</b>	<b>19B</b>	<b>25A</b>	<b>25B</b>	<b>25C</b>	
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>	

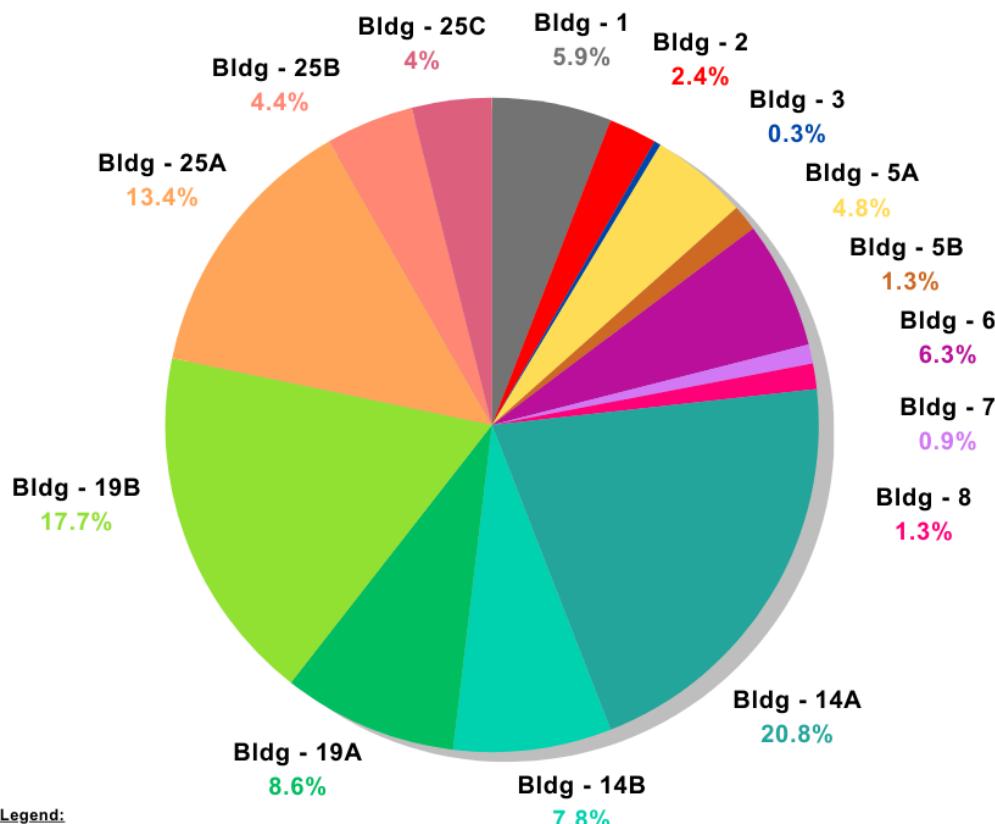
The audit accounted for both functional and non-functional equipment in each building (Tables 4 & 5). A detailed breakdown of each category can be found in Annexes A-J. Building 14A (CSM Main Building) had the highest number of equipment. Additionally, a significant amount of lighting and HVAC equipment was identified in Building 14A (Table 4). Building 1 (Admin) housed the largest number of Electrical Appliances. These findings underscore the importance of strengthening institute-wide regulations on energy consumption to reduce electrical usage and its associated greenhouse gas emissions further.

The daily carbon emissions of MSU-IIT buildings mirrored their energy consumption patterns. Buildings 14A and 19B were the largest contributors to greenhouse gas emissions, recording 0.01376 ppm and 0.01171 ppm respectively (Table 6). These results, directly proportional to energy consumption, highlight the need for retrofitting and focusing energy efficiency measures on these hotspots.



**Table 6.** Greenhouse gas emissions (in ppm) calculated for selected MSU-IIT buildings by day, month, and year.

<b>Building No.</b>	<b>GHG Emitted (ppm)</b>		
	<b>Day</b>	<b>Month</b>	<b>Year</b>
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 - OVCIA/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>



Legend:

1 - Admin Building; 2 - Office of the Chancellor; 3 - Office of Communications; 5A - OVCSI/Registrar/IDS Library/HRM Laboratory;  
5B - OVCIA/Legal Office/HRMD; 6 - Main Library; 7 - MCR/SID; 8 - KTTO; 14A - CSM (Main Building); 14B - CSM (Annex); 19A - CASS (Old Building);  
19B - CASS (New Building); 25A - COE (Main Building); 25B - COE (Right Wing); 25C - COE (Left Wing)

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

The Office of Communications had the lowest GHG emissions, accounting for only 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 for Selected MSU-IIT Buildings

The Department of Energy (DOE) developed the 2020 Guidelines on Energy Conserving Design for Buildings to address the need for reducing energy use by formulating energy-conserving building designs. These guidelines support Republic Act No. 11285, also known as the Energy Efficiency and Conservation Act of 2019. The illuminance test aims to determine whether the light generated from sources such as bulbs and fluorescent lamps meets the standard requirements for the floor area. Table 7 below shows the recommended illuminance levels for different classifications 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 7.** Recommended Design Illuminance Levels (based on 2020 DOE Guidelines on Energy Conserving Design of Buildings).



Detailed results of the illuminance test in the rooms of the selected buildings, based on the 2020 DOE guidelines, can be found in Annex K. Overall, the majority of rooms in the selected buildings of MSU-IIT were found to be under-illuminated (Table 8).

**Table 8.** 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
3 - Office of Communications	130.38	Under Illuminance
5A - OVCSI/Registrar/IDS Library/HRM Laboratory	159.93	Under Illuminance
5B - OVCIA/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



Building No.	Average Illuminance (Lux)	Overall Illuminance Rating
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 9). 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 work performance of students and employees (Knez, 1995).

**Table 9.** Summary of rooms/offices that have illuminance levels in acceptable levels according to DOE guidelines.

Bldg #	Location/Station Name	Illuminance Rating
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



Bldg #	Location/Station Name	Illuminance Rating
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
19B	A11 (Dean's Office)	Normal Illuminance
19B	A12 (Faculty Lounge)	Normal Illuminance
19B	B23 (Mini Learning 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



Bldg #	Location/Station Name	Illuminance Rating
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 10 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 10.** The percentage of rooms with air-conditioned units under the selected buildings of MSU-IIT passed and failed 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 with air-conditioning units conducted had an acceptable indoor temperature. However, only 43% of those rooms were in the recommended relative humidity levels 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 indicate that regular preventive maintenance of HVAC units 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.)

### **3.5 Survey Results on the Awareness, Perception, and Behavioral Practices of MSU-IIT Students to Energy Conservation Policies in MSU-IIT**

#### **3.5.1 Respondent's socio-demographic profiles**

This study has gathered a sample of 432 students across different departments of their respective colleges (Table 11). Most of the gathered respondents were female



(69%), followed by male (26%), while the rest were LGBTQIA+ (5%). Furthermore, the greater portion of the respondents were single (99%), followed by those married (4%).

**Table 11.** Frequency distribution of respondents' sociodemographic backgrounds.

<b>Demographic Variables</b>		<b>N</b>	<b>Percentage (%)</b>
Gender	Female	299	69.2
	Male	113	26.2
	LGBTQIA+	20	4.6
Civil Status	Single	426	98.6
	Married	6	1.4
Highest Educational Attainment	Senior High School	425	98.4
	Bachelor's Degree	1	0.2
	Master's Degree	5	1.2
	Doctorate	1	0.2
Age Range (in years)	Below 25 years old	421	97.5
	25-34 years old	9	2.1
	35-44 years old	1	0.2
	45-54 years old	1	0.2
College			
College of Arts and Social Sciences	1st Year	38	8.8
	2nd Year	18	4.2
	3rd Year	11	2.5



	4th Year	16	3.7
	5th Year	0	0
	Sub-total	83	19.2
College of Computer Studies	1st Year	19	4.4
	2nd Year	8	1.9
	3rd Year	6	1.4
	4th Year	3	0.7
	5th Year	1	0.2
	Sub-total	37	8.6
College of Economics, Business and Accountancy	1st Year	31	7.2
	2nd Year	14	3.2
	3rd Year	0	0
	4th Year	0	0
	5th Year	1	0.2
	Sub-total	46	10.6
College of Education	1st Year	21	4.9
	2nd Year	21	4.9
	3rd Year	7	1.6
	4th Year	23	5.3
	5th Year	0	0
	Sub-total	72	16.7
College of Engineering and Technology	1st Year	63	14.6
	2nd Year	29	6.7
	3rd Year	18	4.2
	4th Year	1	0.2



	5th Year	3	0.7
	Sub-total	114	26.4
College of Science and Mathematics	1st Year	32	7.4
	2nd Year	18	4.2
	3rd Year	8	1.9
	4th Year	3	0.7
	5th Year	0	0
	Sub-total	61	14.2
College of Health Sciences	1st Year	2	0.5
	2nd Year	0	0
	3rd Year	2	0.5
	4th Year	10	2.3
	5th Year	0	0
	Sub-total	14	3.3
School of Interdisciplinary Studies	1st Year	1	0.2
	2nd Year	4	0.9
	3rd Year	0	0
	4th Year	0	0
	5th Year	0	0
	Sub-total	5	1.1
	Grand Total	432	100

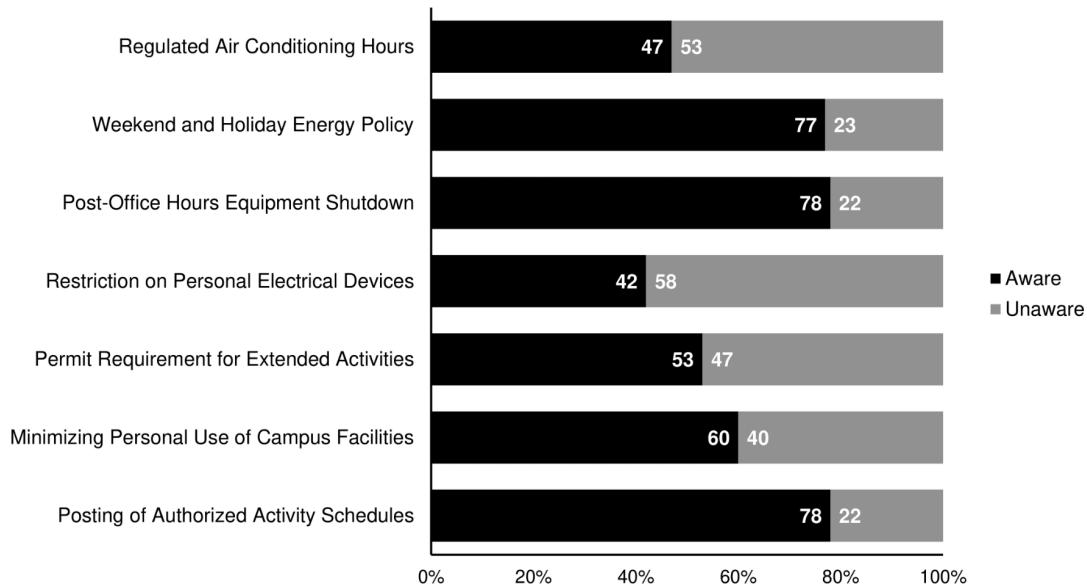
A total of eight colleges were sampled in this study. College of Engineering and Technology had the most respondents ( $N=114$ ), followed by College of Education ( $N=72$ ), College of Arts and Social Sciences ( $N=83$ ), College of Science and



Mathematics ( $N=61$ ), College of Economics, Business and Accountancy ( $N=46$ ), College of Computer Studies ( $N=37$ ), College of Health Sciences ( $N=14$ ). Meanwhile, only the School of Interdisciplinary Studies had five respondents since it was recently acknowledged as a college and only offers graduate programs.

### **3.5.2 Awareness and perception towards existing energy conservation policies in MSU-IIT**

Of the respondents, the most known policy mentioned was unplugging of all electrical equipment after office hours, noted by 78%. This was closely followed by the posting of approved school-related schedules, also mentioned by 78% of the respondents, and the practice of switching off air-conditioning units during weekends and holidays, which was acknowledged by 77% (see Figure 8). The policy that was least mentioned was the usage of electrical appliances by employees, cited by only 42%.



**Figure 8.** Awareness of students towards MSU-IIT energy conservation policies ( $N = 432$ ).

In addition, the students' level of perceptions of the institute's policies, as shown in Table 12, indicates that the students have a high level of support towards the existing policies in the university. The top three areas in which the respondents have a high level of support in terms of policies were unplugging of electrical equipment after office hours, posting of approved activities, and turning off air-conditioning units during weekends and holidays, respectively.

**Table 12.** Respondents' perception towards institute policies in energy conservation.

Policies	Mean Score	Interpretation
1. All air-conditioning units shall be switched on at	3.65	Agree



8:30 AM and switched off at 4:30 PM.

2. All air-conditioning units must be switched off during weekends and holidays, unless otherwise ordered by management.	4.26	Strongly Agree
3. All plugged equipment like water dispensers, air pots, AVR's, (etc.) and knife switches shall be put off after office hours.	4.35	Strongly Agree
4. Employees are not allowed to use electric stoves to cook food, heaters, and other personal electric appliances, in any office inside the campus.	3.64	Agree
5. Activities such as requests for overtime, faculty and staff extension and/or makeup classes other than the approved schedule; where there is usage of electricity shall secure a permit from the Office of the Chancellor, copy furnished to the SID office and RESE office.	3.94	Agree
6. Employees and students should be discouraged from doing their personal work on campus, such as overnight study and others. The use of electric power by students such as dance practice/rehearsals and related activities, especially at the gymnasium, should be regulated.	3.51	Agree
7. Approved schedule of classrooms, laboratories, lecture halls, and library activities shall be posted at the door for easy check-up by the security personnel.	4.27	Strongly Agree

### 3.5.3 Attitude of students towards energy efficiency

Among these topics from Table 13, the importance of energy efficiency in reducing environmental impact was the highest mean score (4.48) from the students. Also, The respondents were neutral (3.18) especially on the awareness of energy



efficiency policies in the university. Overall, the students were positive in their attitude towards energy efficiency.

**Table 13.** Respondents' attitude towards energy efficiency in the university.

Topic	Mean Score	Interpretation
Energy efficiency program in the university	4.00	Agree
Importance of energy efficiency in reducing environmental impact	4.48	Strongly Agree
Personal responsibility in energy efficiency	4.18	Agree
Consciousness of energy efficiency	3.67	Agree
Participation in energy efficiency initiatives	3.71	Agree
Investment in energy efficiency	3.99	Agree
Awareness of energy efficiency policies	3.18	Neutral
University's performance in energy efficiency	3.75	Agree
Prioritization of energy efficiency	4.06	Agree
Willingness to make personal sacrifices	3.88	Agree

### 3.5.4 Behavior/practices of students in the usage of Heating, Ventilation and Air Conditioning (HVAC) units

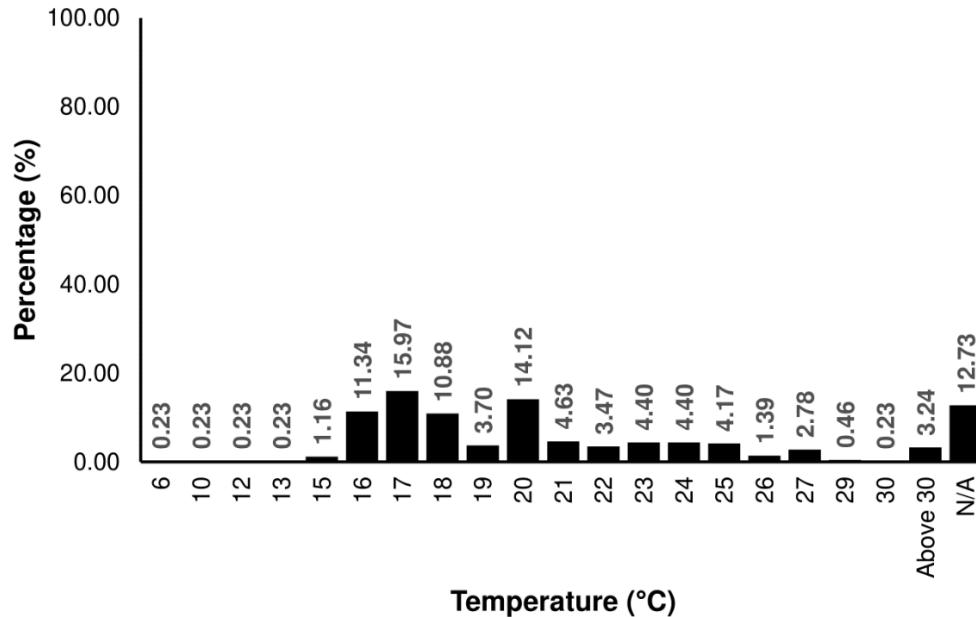
The students' behavior in Table 14 shows that they have a high level of behavioral responses in using HVAC (Heating, Ventilation, and Air Conditioning) units. The respondents' highest responses when turning off air conditioning units were during vacation and at night. Meanwhile, turning off HVAC units for a few hours has the lowest mean score of 4.07 from the respondents.



**Table 14.** Respondents' behavior towards the usage of Heating, Ventilation, and Air Conditioning (HVAC) units. (Never = 5, Rarely = 4, Sometimes = 3, Often = 2, Always = 1)

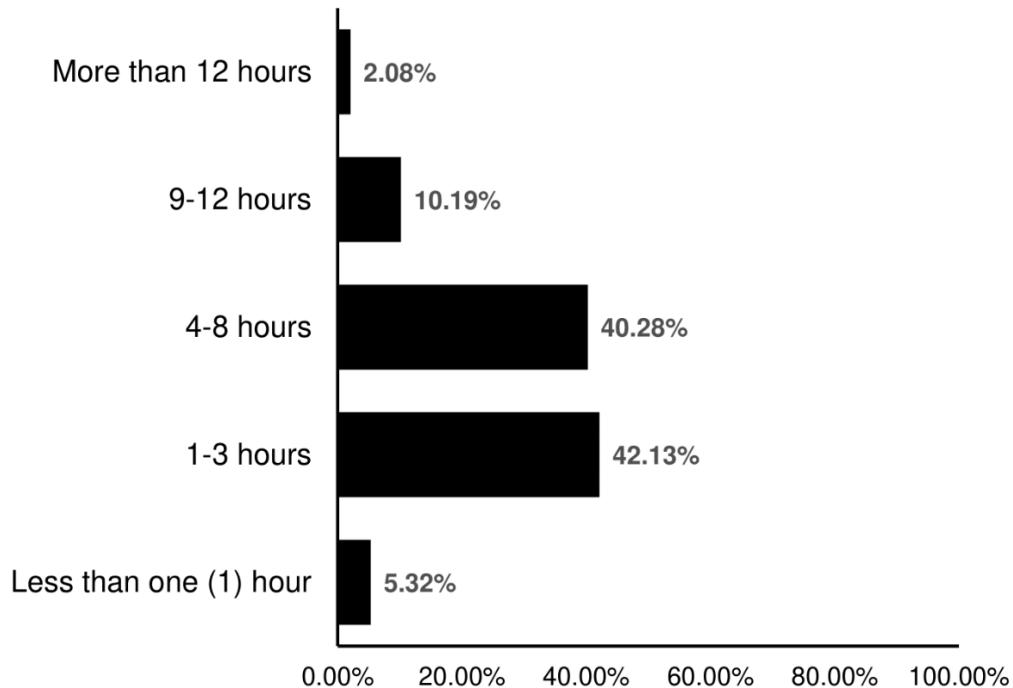
Questions	Mean Score	Interpretation
If you leave your office/classroom at lunchtime (12 noon), will you turn off your air conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.29	Always
When leaving your office/classroom for a meeting, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.38	Always
If you leave your office/classroom for a few hours, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.07	Often
If you leave your office/classroom for the night, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.70	Always
If you leave your office/classroom for vacation, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.77	Always

The temperature setting of air conditioning units among the respondents was also identified. The highest temperature setting that was applied in the air conditioning was 17°C (Figure 9). Meanwhile, other temperatures that had high responses were at temperatures of 16, 17, 19, and 20°C. Also, it was observed that 12.73% of the students responded N/A.



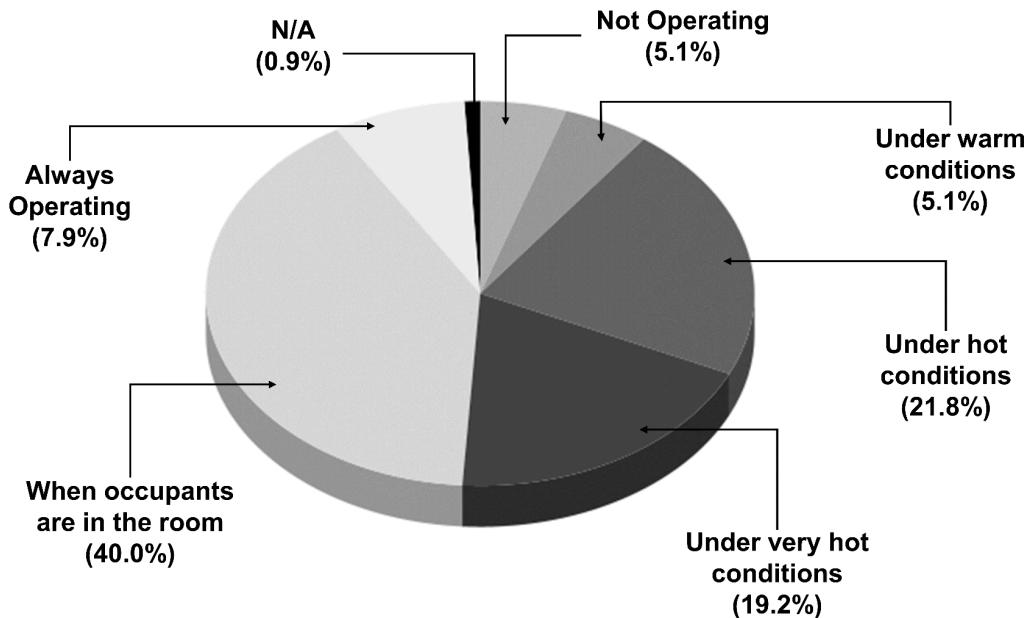
**Figure 9.** Respondents' daily air-conditioning units temperature (°C) ( $N = 432$ ).

Since most of the students used air conditioned units at low temperatures, this study also asked the duration of the air conditioned units was used. Figure 10 results show that most students surveyed say that the average hours of usage of air conditioning units in the campus are around 1-3 hours (42.13%) and 4-8 hours (40.28%). A small percentage of students were found to use air conditioning units in the campus at less than one (1) hour (5.32%) and more than 12 hours (2.08%).



**Figure 10.** Respondents' daily usage in hours of air-conditioning units.

The behavioral practices of the respondents in terms of their operating conditions of HVAC units was examined. Figure 11 shows that respondents switch on air conditioning units in the campus when there are occupants in the room (40%) and under hot conditions (21.8%). Nineteen point two percent used their HVAC units under very hot conditions. Interestingly, out of 432 students surveyed, only 7.9% had their air conditioning units always in operation.



**Figure 11.** Respondents' operating conditions of their air-conditioning units.

The results of the chi-square test to assess the relationship between the student's socio-demographic profile and their behavior/practices of HVAC units are presented in Table 15. There is a significant association between duration of using HVAC units and both college and year level ( $p < 0.05$ ). At the college level, operation conditions of HVAC units showed a significant association but there was no significant association at the year level. Similarly, the time of switching on of HVAC units at the college level resulted in a significant association but not at the year level.

**Table 15.** Association of behavior/practices towards HVAC with socio-demographic profile of students

Behavior	College ( $\chi^2$ )	Year Level ( $\chi^2$ )
----------	----------------------	-------------------------



Duration (in hours) of using HVAC units	48.1*	27.3*
Type of HVAC units used in classrooms during summer	66.1	36.2
Operation conditions of HVAC units	79.7*	32.4
Time of switching on of HVAC units	254*	113

Note \*  $p < 0.05$

### 3.5.4 Relationship between HVAC behavioral patterns, existing energy conservation policies in MSU-IIT and attitude towards energy efficiency of students.

To see if there is a difference between the attitude towards energy efficiency policies and the student's year level and colleges they represent, One-way ANOVA/Kruskal-Wallis was applied. Attitude has a significant difference among colleges, with a p-value of 0.003. Meanwhile, the year level of students showed no significant differences. Moreover, it was found that there is a significant difference between perception towards energy efficiency and the year level of students ( $p < 0.05$ ) (Table 16).

**Table 16.** One-way ANOVA/Kruskal-Wallis results regarding the study variables by college and year level

Dependent Variable	Independent Variables	$\chi^2$	F	df1	df2	p
--------------------	-----------------------	----------	---	-----	-----	---



Behavioral Practices	College	10.6	7	0.157
	Year Level	5.36	4	0.252
Attitude	College	3.65	7	53.7
	Year Level	1.62	4	29.3
Perception	College	5.96	4	0.202
	Year Level	16	7	0.025*
Awareness	College	3.14	4	0.535
	Year Level	13.1	7	0.069

Note \*  $p < 0.05$

To explore the relationship between variables, chi-square analysis was applied. Table 17 below shows that the student's behavioral practices towards the usage of HVAC units in the campus and attitude have a significant association ( $p < 0.01$ ). Also, there is a significant association between attitude towards energy efficiency and perception ( $p < 0.001$ ) and awareness of institute policies in relation to energy conservation practices ( $p < 0.001$ ). In the same way, the perception of the students towards energy conservation policies and awareness of the existing policies demonstrates a positive correlation ( $p < 0.05$ ).



**Table 17.** Chi-square analysis results of the different topics of the survey

	Behavioral Practices		Attitude		Perception		Awareness	
	X <sup>2</sup>	df	X <sup>2</sup>	df	X <sup>2</sup>	df	X <sup>2</sup>	df
Behavioral Practices	-							
Attitude	29.9 **	12	-					
Perception	24.2	16	8.63 ***	12	-			
Awareness	6.17	4	24.6 ***	3	10.4 *	4	-	

Note. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Energy consumption and energy conservation has been a challenge due to the rising human population (Sorrell, 2015) and climate change (Ascione, 2017). The study interviewed students of MSU-IIT by examining their perception and awareness towards existing institute's policies in energy conservation, their attitude towards energy efficiency, and also their behavior/practices towards the usage of HVAC units. The results showed that most of the students were well aware of the policy of MSU-IIT regarding energy conservation policies. Only 2 policies namely: "Regulated Air Conditioning Hours" and "Restriction on Personal Electrical Devices" were less aware of these policies but the margin between the aware and the unaware is small. In addition, the student's college and year level did not show any significant difference between awareness of the institute's energy conservation policies. Their awareness of these existing policies could play a factor when they are exposed to energy conservation activities prior to entering college. It was found out in a study that Filipino students who



are exposed to science literacy during their high school promotes engagement in energy conservation activities especially in their households (Aruta, 2018). This encourages college students to practice energy consumption activities due to increasing awareness that would eventually result in a lower energy consumption (Hassan et al., 2009). Also, the results demonstrate that university students have an overall positive response to the current energy conservation policies in MSU-IIT. A similar study by Shafei & Maleksaeidi (2020) also observed that since students are already at an age where they are able to discern that the current environmental status is unfavorable which allows them to support pro-environmental actions.



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## 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.

## **VII. Policy Recommendations and Target Recipients/Agencies**

From the results of the study, the following are the recommendations to further lower our energy consumption and emissions:

- 1) A regular maintenance check on HVAC units of all the offices to ensure it is properly functioning and efficient in maintaining the appropriate room temperature and relative humidity of rooms according to the Department of Energy guidelines.

Target Agencies: Physical Plant Division (PPD) and Office Heads

- 2) Replacing busted and existing lighting to LED type of light bulbs & fluorescent lamps of the same wattage but higher light output (lumens) on rooms that were highlighted as “Under Illuminance.” In addition, a continuous inventory to assure that all lights are in good condition and timely replacements of lights. This promotes better work performance and overall mood on students, faculty and staff of MSU-IIT.

Target Agencies: Physical Plant Division (PPD), Supply and Property Management Division (SPMD) and Office of Budget Management (OBM) & OVCAF



3) Installation of sub-meters to all rooms in the campus for easier auditing and to determine which rooms/offices consume the most energy and to find alternatives and best practices to lessen energy consumption.

Target Agencies: Physical Plant Division (PPD), Office of the Chancellor (OC)

4) Reinforcing the existing energy conservation policies inside the campus by allowing security personnel to double check rooms if HVAC and lights are properly turned off according to the policies that were implemented. Also, adding IEC (Information, Education, and Communication) Campaigns that will be posted to the rooms and offices for awareness of these policies in the campus.

Target Agencies: Security and Investigation Division, Office of the Chancellor (OC)

**VIII. Outputs Generated from the Research Project Publication, Patents, Students trained, among others**



## ANNEX

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

<b>Operations</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>
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.														
	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.







ENAV	Vector Network Analyzer	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Fabricator	Faraday Cage	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Flootation Dryer/Oven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorescenc e	Microscope	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Forced Air Drying Oven	FPGA Boards	-	-	-	-	-	-	-	-	6	-	-	-	3	-
Fraction Allectro	Freeze Dryer	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Freezer	Fume Hood	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Function Generator	Gas Chromatogr aph	-	-	-	-	-	-	-	-	4	3	-	-	-	-
Furnace	Generator	-	-	-	-	-	-	-	-	-	-	-	3	-	-
Galvanostat	Grinder	-	-	-	-	-	-	-	-	1	-	-	-	1	-
Grinder Polisher	Hall Effect Apparatus	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Hot Air Oven	Hot Plate	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Hot Plate Stirrer	HVCC	-	-	-	-	-	-	-	-	-	6	-	-	-	1
Hybrid Power Inverter	Hydraulics Bench	-	-	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-
Oscilloscop e	-	-	-	-	-	-	-	-	-	-	-	-	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	-	-





Spectrometer	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Stereo Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sterilizer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stirrer	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Stirring Hot Plate	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
Super Critical Fluid Extractor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Table Top Centrifuge	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Tachometer	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-
TGA 4000 Thermogravimetric Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thermal Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Thermolyne	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
TIUS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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 Ultrasonic Cleaning Device	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Universal Oven	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Universal Testing Machine	-	-	-	-	-	-	-	-	-	-	-	-	1	-
UPS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UV-VIS Spectrophotometer	-	-	-	-	-	-	-	-	-	1	-	-	-	-
V.A Stand Vacuum Cleaner	-	-	-	-	-	-	-	-	-	1	-	-	-	-
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>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



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 -												3	-	-	-
Chandelier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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>	12	4	1	40	0	21	3	6	34	69	64	3	71	232	85

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





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).

<b>HVAC</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>
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.

















Water	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chiller	-	-	-	-	-	-	-	-	-	-	-	-	-	
Water	-	-	-	-	-	-	-	-	-	-	-	-	-	
Jacketed	-	-	-	-	-	-	-	-	-	-	-	-	-	
Incubator	-	-	-	-	-	-	-	-	-	-	-	-	-	
Water Pump	-	-	-	-	-	-	-	-	-	-	-	-	-	
Water	-	-	-	-	-	-	-	-	-	-	-	-	-	
Purification	-	-	-	-	-	-	-	-	-	-	-	-	-	
System	-	-	-	-	-	-	-	-	-	-	-	-	-	
Waveform	-	-	-	-	-	-	-	-	-	-	-	-	-	
Generator	-	-	-	-	-	-	-	-	-	-	-	-	-	
Weighing	-	-	-	-	-	-	-	-	-	-	1	-	-	
Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	
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>1</b>	<b>8</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>13</b>	<b>12</b>	<b>6</b>

K. Illuminance test results of rooms in the selected buildings of MSU-IIT.

Bldg #	Location/Station Name	Sub-section s (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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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		167.94	
1	OVCSS - Pantry	Normal Illuminance		100.82	
1	OVCSS - VC's Office	Under Illuminance		120.91	
1	OVCAF - Workstation	Under Illuminance		85.05	
1	OVCAF - Pantry	Under Illuminance		71.76	
1	OVCAF - VC's Office	Under Illuminance		129.47	
1	COA - Workstation	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		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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
1	IASU - Workstation	Under Illuminance	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		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
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		94.72	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
2	OC - Boardroom	Under Illuminance	Under Illuminance	234.13	2 panel lights not functioning
2	OC - Hallway	Normal Illuminance		198.08	
2	OC - Chancellor's Office #1	Under Illuminance	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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
5A	HRM Laboratory - Oven Area	Under Illuminance	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		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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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) - Chaiperson's Office	Under Illuminance		273.86	
19B	B21 (English Department) - Archives	Normal Illuminance		183.17	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19B	B21 (English Department) - Pantry	Normal Illuminance	Under Illuminance	370.75	
19B	B22 - Langkit Office	Under Illuminance		276.06	
19B	B23 (Mini Leaning Commons)	Normal Illuminance		410.82	
19B	B23 (Mini Leaning Commons) - Pantry	Normal Illuminance		279.78	
19B	C31 (Department of Filipino and Other Languages) - Entrance	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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19B	Political Science Department - Archives	Normal Illuminance		232.89	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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
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	



Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	Cashering Division	23.84	65.29	25.37	89.10	21
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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
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 Chemistry	26.17	57.94	30.13	78.30	20
14A	Department (Room 302) Chemistry	27.53	65.03	29.07	81.42	16
14A	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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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	Aspetic Room	29.68	73.45	29.97	75.53	AC Off
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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
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 Learning 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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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	
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
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	
25A	Room 114	29.62	76.55	28.53	77.60	
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	
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	
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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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					
25A	(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
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



Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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/					
25C	Computer Lab (Room 525)	26.44	47.79	30.97	70.53	18
25C	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

Department of Research  
**TERMINAL REPORT (Form 2)**  
(Last Quarter of Implementation)

OVCRE-DR Form  
(2020)

for the Period: 4 of 4 Quarters (Inclusive dates March 2024 to December 2024)

PROGRAM TITLE	: Energy Efficiency and Greenhouse Gas (GHG) Emission Reduction Program for MSU-IIT (EEGGERP)
PROJECT TITLE/DURATION	: Energy and Greenhouse Gas Auditing of MSU-IIT Buildings (March 2024 - December 2024)
PROJECT LEADER	: Hernando P. Bacosa, Ph.D.

TARGET ACTIVITIES FOR THE PERIOD (BASED ON APPROVED PROPOSAL)	ACTUAL ACCOMPLISHMENT	PERCENTAGE ACCOMPLISHMENT		PROJECT EXPENDITURES FOR THE PERIOD	REMARKS
		FOR THE PERIOD	CUMULATIVE (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	The purchase request was granted, received, and used in the field survey.	100%	100%	15,000.00	
Hiring and Deployment of Research Assistant	The research assistant was hired and is currently working.	100%	100%	152,088.00	Utilized salary allocation
Hiring and Deployment of Field Assistant	The field assistant was hired and is currently working.	100%	100%	111,280.00	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, Ph.D.

Project Leader

1/7/2025

Date

Noted:



HILLY ANN ROA-QUIAOIT, Ph.D

Dean, SIS

NOTE:

Upload accomplished form to REIS with Form 1.

Have this form signed by the corresponding signatories

TECHNICAL REPORT

**ENERGY AND GREENHOUSE GAS AUDITING OF MSU-IIT BUILDINGS**

**Hernando P. Bacosa, Melgie A. Alas, Peter D. Suson, Noel R. Estoperez, Napoleon A. Enteria, Rovick P. Tarife, Mark June L. Aporador, Kim Emissary C. Magarin, Ryan Lloyd R. Carpentero**

(March 2024 - December 2024)

## **ABSTRACT**

The Mindanao State University – Iligan Institute of Technology (MSU-IIT) supports the Sustainable Development Goals (SDGs). Over the past decade, MSU-IIT has used a lot of electricity. Additionally, using large amounts of electricity contributes to local air pollution and resource depletion. This study presents the first phase of energy audit procedures at MSU-IIT. Its objectives are (1) to carry out a detailed energy audit of selected buildings, (2) to perform a static illuminance test in those buildings, (3) to conduct temperature and humidity tests in each room, and (4) to evaluate MSU-IIT students' views and awareness of energy consumption on campus. The results of this study revealed that academic buildings consume more energy than the other buildings. It was also observed that Heating, Ventilation, and Air Conditioning (HVAC) units were key contributors to electricity usage and greenhouse gas emissions. In addition, the overall illuminance levels in the rooms were identified as under illuminance. Seventy percent of the rooms with air-conditioning units maintained an acceptable indoor temperature; however, only 43% reached the recommended relative humidity levels according to the 2020 DOE guidelines. Furthermore, the survey revealed that students are generally well-informed about the institute's energy conservation policies. However, 63% of the students preferred setting air-conditioning units to low-temperature levels (below 21°C). Overall, these results underscore the importance of regular maintenance of HVAC units, replacing lighting systems with alternatives that maintain the same wattage but offer improved light output, and promoting energy-efficient practices to further reduce energy consumption at the university.

**Keywords:** Energy Audit, Energy Consumption, Greenhouse Gas Emissions, Illuminance Test, HVAC.

## INTRODUCTION

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, (3) to conduct temperature and humidity test on each rooms of the buildings and (4) to assess the behavior, perception and awareness of MSU-IIT students on energy consumption in MSU-IIT. This study will serve as a 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.

## MATERIALS AND METHODS

### *Study Location*

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 (OVCIA)/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

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### *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 (Kharti, 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.

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.

### *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. A light meter was used to collect the light intensity emitted in the rooms and offices. 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. Establishing a measurement grid allows for systematic and comprehensive coverage of the area (Figure 1).



**Figure 1.** The conducting of illuminance test and selection of test points at the OVCSI and MCR office

Floor plan of the buildings was used to determine the measurement points for the illuminance test. Room Index was applied and shown in equation 5:

$$\text{Room Index (RI)} = \frac{L \times W}{H_m (L + W)} \quad (5)$$

where L = length of interior

W = width of interior

$H_m$  = the mounting height, which is the height of the lighting fittings above the horizontal working

#### *Temperature and Humidity Test*

The sensors were placed at 5 areas of the room: at 4 corners and 1 at the center of the room. This is to ensure that room temperature and relative humidity that was collected represents the entire room. The mean indoor temperature and relative humidity was calculated

*Survey on Awareness, Perception and Behavioral Practices of MSU-IIT Students to Energy Conservation Policies in MSU-IIT*

The students of MSU-IIT were the target participants of the survey to determine their level of awareness, behavioral practices and perception towards energy efficiency in the university. Stratified random sampling was applied in this study. It has an estimated student population of 13,273. A total of 432 respondents, each representing their department under 8 different colleges.

This study applied a survey questionnaire, “pen and paper” and online, to measure the students' level of behavioral practices and attitude towards energy efficiency. The first component was the respondent's sociodemographic profile consisting of respondent's name (optional), name of college and their department, gender, civil status, highest educational attainment, age and monthly income.

The second component of the questionnaire was the behavioral practices of the usage of Heating, Ventilation and Air Conditioning (HVAC) units where it aims to assess their practices on using the HVAC units. This part of the questionnaire had two subcomponents where the first half consists of the specific time of use of the HVAC units, its duration and temperatures. While the second half contains a five-point Likert scale that aims to measure the level of behavioral practices of the respondents to energy efficiency and HVAC units. (Never = 5, Rarely = 4, Sometimes = 3, Often = 2, Always = 1). The internal consistency of the behavior scale was favorable, its Cronbach's alpha value was 0.81.

The third component is the five-point Likert scale that aims to measure the respondent's level of attitude toward energy efficiency and their willingness. (Strongly disagree = 5, Disagree= 4, Neutral = 3, Agree = 2, Strongly Agree = 1).

### *Data Analysis*

To calculate the amount of energy used from the diagnostic energy audit, the following equations below are used:

$$\text{Energy Consumption (kWh)} = \text{Kilowatt (kW) of Equipment} \times \text{Daily Consumption (hrs)} \quad (1)$$

The energy cost is derived from the energy consumption of equipment and is multiplied by the local average electricity rate of Iligan Light Power Incorporated (a local electricity utility company) which is ₱12/kWh.

$$\text{Energy Cost (₱)} = \text{Energy Consumption (kWh)} \times ₱12/\text{kWh} \quad (2)$$

From the energy consumption of the equipment that was collected, the equivalent greenhouse gas (GHG) emissions can now be derived using the following equation.

$$\text{GHG Emissions (kg CO}^2\text{)} = \text{Energy Consumption (kWh)} \times \text{Emission Factor} \quad (3)$$

$$\text{GHG Emissions (ppm)} = \frac{\text{GHG Emissions (kg CO}^2\text{)}}{2,129,700 \text{ kg CO}^2/\text{ppm}} \quad (4)$$

where Emission Factor = 0.5555 (according to DOE Power Statistics, 2017)

where 2,129,700 kg CO<sup>2</sup> corresponds to the mass of CO<sup>2</sup> to 1 ppm using the mass of the Earth's atmosphere at  $5.1 \times 10^{18}$  kg (Trenberth & Guillemot, 1994) and the

current concentration of CO<sub>2</sub> in the atmosphere is approximately 417 ppm (NOAA, 2022)

For the survey questionnaire, the collected data were tabulated and analyzed using Jamovi ver. 2.16.17, which is an open-source statistical software. The frequency and distribution of the socio demographic of the respondents were calculated using descriptive statistics (frequency, mean, median and percentage). In addition, the reliability of the questionnaire was calculated using Cronbach's alpha. Chi-square analysis was applied to determine the strength of relationship between behavioral practices (towards energy usage and institute policies), attitude and awareness of institute policies. In addition, One-Way ANOVA/Kruskal-Wallis was applied to assess if there are significant differences of sociodemographic variables to behavioral practices, attitude and awareness. Also, Chi-square analysis was employed to measure the difference between student's demographics and their behavior/practices towards HVAC usage and energy consumption.

## RESULTS AND DISCUSSION

### *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. Figure 2 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.

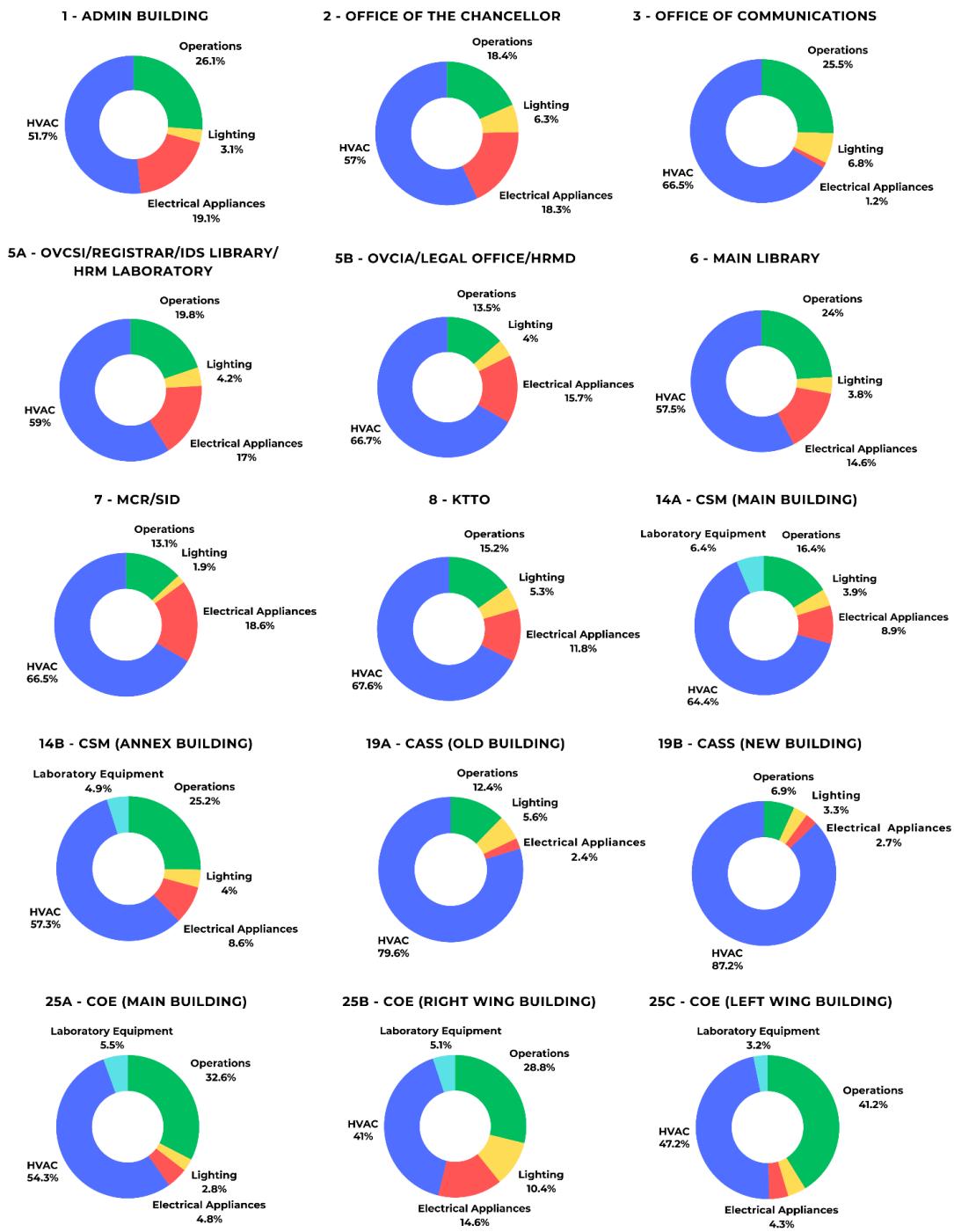
Building No.	Total kilowatts	Energy Consumed (kwh)		
		Day	Month	Year
1 - Admin Building	120.51	693.19	15,004.80	180,057.65
2 - Office of the Chancellor	35.30	269.04	6,011.07	72,052.76
3 - Office of Communications	5.71	39.66	857.52	10,290.28
5A - OVCSI/Registrar/IDS Library/HRM Laboratory	114.29	591.08	12,224.78	146,697.41
5B - OVCIA/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

<b>Building No.</b>	<b>Total kilowatts</b>	<b>Energy Consumed (kwh)</b>		
		<b>Day</b>	<b>Month</b>	<b>Year</b>
<b>25B - COE (Right Wing)</b>	87.19	564.44	11,055.29	132,663.56
<b>25C - COE (Left Wing)</b>	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>

**Table 3.** Energy cost (in pesos) in selected buildings of MSU-IIT according to Day, Month, and Year.

<b>Building No.</b>	<b>Energy Cost (in pesos)</b>		
	<b>Day</b>	<b>Month</b>	<b>Year</b>
<b>1 - Admin Building</b>	8,318.28	180,057.60	2,160,691.80
<b>2 - Office of the Chancellor</b>	3,228.48	72,132.84	864,633.12
<b>3 - Office of Communications</b>	475.92	10,290.24	123,483.36
<b>5A - OVCSI/Registrar/IDS Library/HRM Laboratory</b>	7,092.96	146,697.36	1,760,368.92
<b>5B - OVCIA/Legal Office/HRMD</b>	1,771.44	39,190.20	470,280.60
<b>6 - Main Library</b>	8,859.34	190,616.16	2,287,392.72
<b>7 - MCR/SID</b>	1,301.76	28,409.28	340,910.28
<b>8 - KTTO</b>	1,865.52	38,526.00	462,311.28
<b>14A - CSM (Main Building)</b>	30,562.15	620,968.97	7,451,627.59
<b>14B - CSM (Annex)</b>	11,166.92	238,259.46	2,857,913.47
<b>19A - CASS (Old Building)</b>	12,857.88	262,743.24	3,152,919.72
<b>19B - CASS (New Building)</b>	19,671.36	410,487.00	4,925,843.40
<b>25A - COE (Main Building)</b>	20,654.50	388,751.36	4,665,016.34
<b>25B - COE (Right Wing)</b>	6,134.33	119,233.98	1,430,807.73

Building No.	Energy Cost (in pesos)		
	Day	Month	Year
25C - COE (Left Wing)	6,758.56	119,929.37	1,439,152.41
<b>Total</b>	<b>127,826.51</b>	<b>2,627,129.70</b>	<b>31,523,392.61</b>



**Figure 2.** 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 a 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. The corresponding costs of the energy consumption from the diagnostic energy audit is found at Table 3. These results highlight areas of high energy usage and potential opportunities for energy efficiency improvements.

**Table 4.** 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>	<b>769</b>	<b>236</b>	<b>60</b>	<b>541</b>	<b>156</b>	<b>670</b>	<b>89</b>	
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>	<b>2248</b>	<b>523</b>	<b>1003</b>	<b>1300</b>	<b>1285</b>	<b>799</b>	<b>625</b>	

**Table 5.** 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

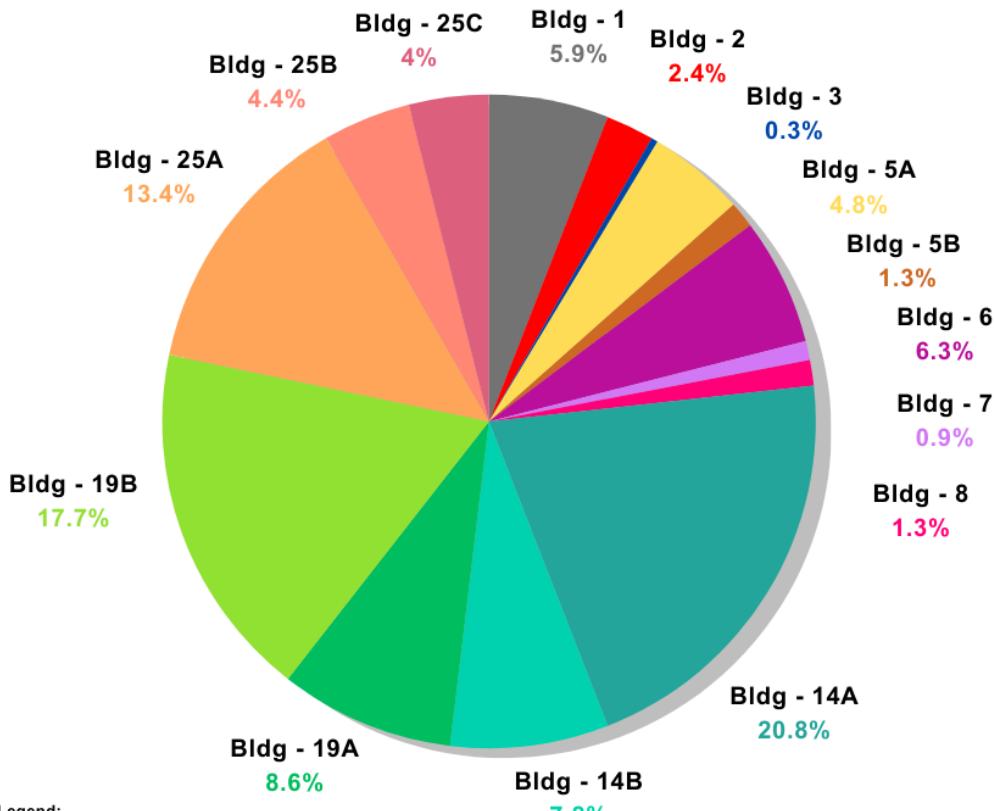
Laboratory Equipment	0	0	0	0	0	0	0	1
<b>Total:</b>	55	13	3	61	4	62	16	12
<b>Equipment</b>	<b>14A</b>	<b>14B</b>	<b>19A</b>	<b>19B</b>	<b>25A</b>	<b>25B</b>	<b>25C</b>	
Operations	23	38	37	24	58	56	12	
Lighting	34	69	64	3	71	232	85	
Electrical Appliances	10	5	3	0	4	4	0	
HVAC	7	5	18	1	21	9	5	
Laboratory Equipment	8	7	0	7	13	12	6	
<b>Total:</b>	82	124	122	35	167	313	108	

The functional and non-functional equipment of each building was accounted for (Table 4 & 5). 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 4). 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 6). 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 6.** Calculated greenhouse gas in (ppm) in selected buildings of MSU-IIT according to Day, Month, and Year.

<b>Building No.</b>	<b>GHG Emitted (ppm)</b>		
	<b>Day</b>	<b>Month</b>	<b>Year</b>
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 - OVCIA/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>



**Figure 3.** Monthly greenhouse gas emission (ppm) of selected MSU-IIT buildings

The Office of Communications had the lowest GHG emissions with emissions of 0.3%, (Figure 3). 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.

### *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 7 below shows recommended illuminance levels in different classification of rooms and other building areas.

<b>Task</b>	<b>Min. &amp; Max. (Lux)</b>	<b>Applications</b>
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 7.** 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 be located in the Annex K. Overall, the illuminance levels of the most rooms of the selected buildings of MSU-IIT were discovered to be under illuminated (Table 8).

**Table 8.** Summary of illuminance levels in selected buildings of MSU-IIT.

<b>Building No.</b>	<b>Average Illuminance (Lux)</b>	<b>Overall Illuminance Rating</b>
<b>1 - Admin Building</b>	108.71	Under Illuminance
<b>2 - Office of the Chancellor</b>	153.55	Under Illuminance
<b>3 - Office of Communications</b>	130.38	Under Illuminance
<b>5A - OVCSI/Registrar/IDS Library/HRM Laboratory</b>	159.93	Under Illuminance
<b>5B - OVCIA/Legal Office/HRMD</b>	108.73	Under Illuminance
<b>6 - Main Library</b>	136.53	Under Illuminance
<b>7 - MCR/SID</b>	102.83	Under Illuminance
<b>8 - KTTO</b>	124.28	Under Illuminance
<b>14A - CSM (Main Building)</b>	169.87	Under Illuminance
<b>14B - CSM (Annex)</b>	119.37	Under Illuminance
<b>19A - CASS (Old Building)</b>	155.50	Under Illuminance
<b>19B - CASS (New Building)</b>	289.97	Under Illuminance
<b>25A - COE (Main Building)</b>	139.95	Under Illuminance
<b>25B - COE (Right Wing)</b>	204.59	Under Illuminance

<b>Building No.</b>	<b>Average Illuminance (Lux)</b>	<b>Overall Illuminance Rating</b>
<b>25C - COE (Left Wing)</b>	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 9). 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 9.** 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

<b>Bldg #</b>	<b>Location/Station Name</b>	<b>Illuminance Rating</b>
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
19B	A11 (Dean's Office)	Normal Illuminance
19B	A12 (Faculty Lounge)	Normal Illuminance
19B	B23 (Mini Learning 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

<b>Bldg #</b>	<b>Location/Station Name</b>	<b>Illuminance Rating</b>
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

*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 10 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 10.** 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

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Number of rooms that failed to the DOE Standard (in %)	30	57
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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 indicate 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.)

#### *Survey Results on the Awareness, Perception and Behavioral Practices of MSU-IIT Students to Energy Conservation Policies in MSU-IIT*

This study has gathered a sample of 432 students across different departments of their respective colleges (Table 11). Most of the gathered respondents were women (69%), followed by men (26%), while the rest were LGBTQIA+ (5%). Furthermore, the greater portion of the respondents were single (99%) and followed by those who were married (4%).

**Table 11.** Frequency distribution of respondents' sociodemographic backgrounds.

<b>Demographic Variables</b>		<b>N</b>	<b>Percentage (%)</b>
Gender	Woman	299	69.2
	Man	113	26.2
	LGBTQIA+	20	4.6
Civil Status	Single	426	98.6
	Married	6	1.4
Highest Educational Attainment	Senior High School	425	98.4
	Bachelor's Degree	1	0.2
	Master's Degree	5	1.2
	Doctorate	1	0.2
Age Range (in years)	Below 25 years old	421	97.5
	25-34 years old	9	2.1
	35-44 years old	1	0.2
	45-54 years old	1	0.2
College			
College of Arts and Social Sciences	1st Year	38	8.8
	2nd Year	18	4.2
	3rd Year	11	2.5
	4th Year	16	3.7
	5th Year	0	0
	Sub-total	83	19.2
College of Computer Studies	1st Year	19	4.4
	2nd Year	8	1.9
	3rd Year	6	1.4
	4th Year	3	0.7

	5th Year	1	0.2
	Sub-total	37	8.6
	1st Year	31	7.2
College of Economics, Business and Accountancy	2nd Year	14	3.2
	3rd Year	0	0
	4th Year	0	0
	5th Year	1	0.2
	Sub-total	46	10.6
College of Education	1st Year	21	4.9
	2nd Year	21	4.9
	3rd Year	7	1.6
	4th Year	23	5.3
	5th Year	0	0
	Sub-total	72	16.7
College of Engineering and Technology	1st Year	63	14.6
	2nd Year	29	6.7
	3rd Year	18	4.2
	4th Year	1	0.2
	5th Year	3	0.7
	Sub-total	114	26.4
College of Science and Mathematics	1st Year	32	7.4
	2nd Year	18	4.2
	3rd Year	8	1.9
	4th Year	3	0.7
	5th Year	0	0
	Sub-total	61	14.2

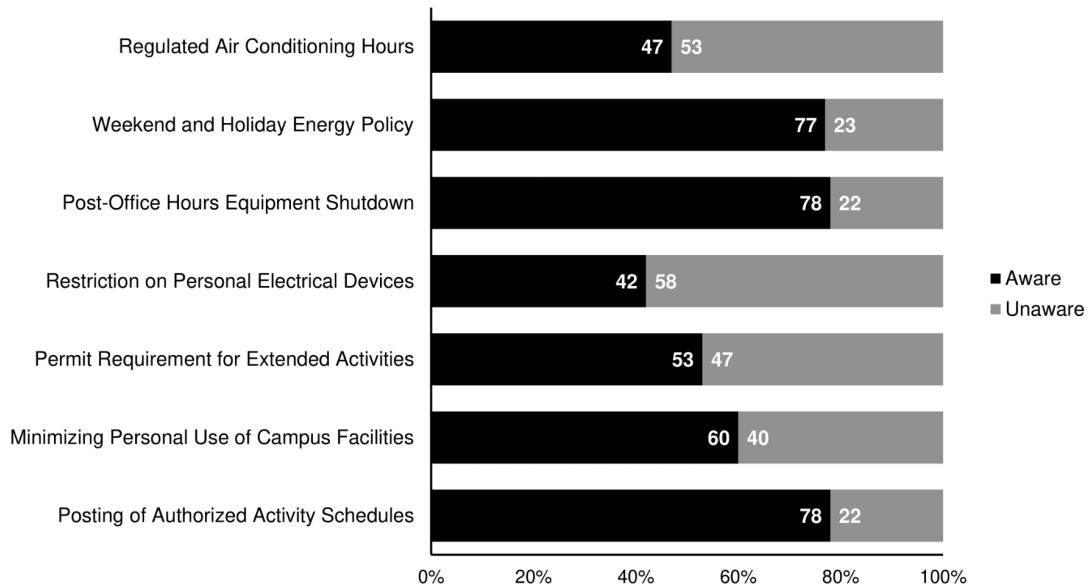
	1st Year	2	0.5
	2nd Year	0	0
College of Health Sciences	3rd Year	2	0.5
	4th Year	10	2.3
	5th Year	0	0
	Sub-total	14	3.3
School of Interdisciplinary Studies	1st Year	1	0.2
	2nd Year	4	0.9
	3rd Year	0	0
	4th Year	0	0
	5th Year	0	0
	Sub-total	5	1.1
	Grand Total	432	100

A total of eight colleges were sampled in this study. College of Engineering and Technology had the most respondents ( $N=114$ ), followed by College of Education ( $N=72$ ), College of Arts and Social Sciences ( $N=83$ ), College of Science and Mathematics ( $N=61$ ), College of Economics, Business and Accountancy ( $N=46$ ), College of Computer Studies ( $N=37$ ), College of Health Sciences ( $N=14$ ). Meanwhile, only the School of Interdisciplinary Studies had 5 respondents since it was recently acknowledged as a college and it only offers graduate programs.

#### *Awareness and perception towards existing energy conservation policies in MSU-IIT*

Of the respondents, the most known policy mentioned was unplugging of all electrical equipment after office hours (78%), followed by the posting of approved school related schedules (78%) and switching off of air-conditioning units during weekends and

holidays (77%) (Figure 4). The least commonly mentioned policy was the usage of electrical appliances by employees (42%).



**Figure 4.** Awareness of students towards MSU-IIT energy conservation policies ( $N = 432$ ).

In addition, the students' level of perception towards institute policies in Table 12 indicates that the students have a high level of support towards the existing policies in the university. The top three areas in which the respondents have a high level of support in terms of policies were unplugging of electrical equipment after office hours, posting of approved activities, and turning off air-conditioning units during weekends and holidays, respectively.

**Table 12.** Respondents' perception towards institute policies in energy conservation.

Policies	Mean Score	Interpretation
1. All air-conditioning units shall be switched on at 8:30 AM and switched off at 4:30 PM.	3.65	Agree
2. All air-conditioning units must be switched off during weekends and holidays, unless otherwise ordered by management.	4.26	Strongly Agree
3. All plugged equipment like water dispensers, air pots, AVR, (etc.) and knife switches shall be put off after office hours.	4.35	Strongly Agree
4. Employees are not allowed to use electric stoves to cook food, heaters, and other personal electric appliances, in any office inside the campus.	3.64	Agree
5. Activities such as requests for overtime, faculty and staff extension and/or makeup classes other than the approved schedule; where there is usage of electricity shall secure a permit from the Office of the Chancellor, copy furnished to the SID office and RESE office.	3.94	Agree
6. Employees and students should be discouraged from doing their personal work on campus, such as overnight study and others. The use of electric power by students such as dance practice/rehearsals and related activities, especially at the gymnasium, should be regulated.	3.51	Agree
7. Approved schedule of classrooms, laboratories, lecture halls, and library activities shall be posted at the door for easy check-up by the security personnel.	4.27	Strongly Agree

#### *Attitude of students towards energy efficiency*

Among these topics from Table 13, the importance of energy efficiency in reducing environmental impact was the highest mean score (4.48) from the students. Also, The respondents were neutral (3.18) especially on the awareness of energy efficiency policies

in the university. Overall, the students were positive in their attitude towards energy efficiency.

**Table 13.** Respondents' attitude towards energy efficiency in the university.

Topic	Mean Score	Interpretation
Energy efficiency program in the university	4.00	Agree
Importance of energy efficiency in reducing environmental impact	4.48	Strongly Agree
Personal responsibility in energy efficiency	4.18	Agree
Consciousness of energy efficiency	3.67	Agree
Participation in energy efficiency initiatives	3.71	Agree
Investment in energy efficiency	3.99	Agree
Awareness of energy efficiency policies	3.18	Neutral
University's performance in energy efficiency	3.75	Agree
Prioritization of energy efficiency	4.06	Agree
Willingness to make personal sacrifices	3.88	Agree

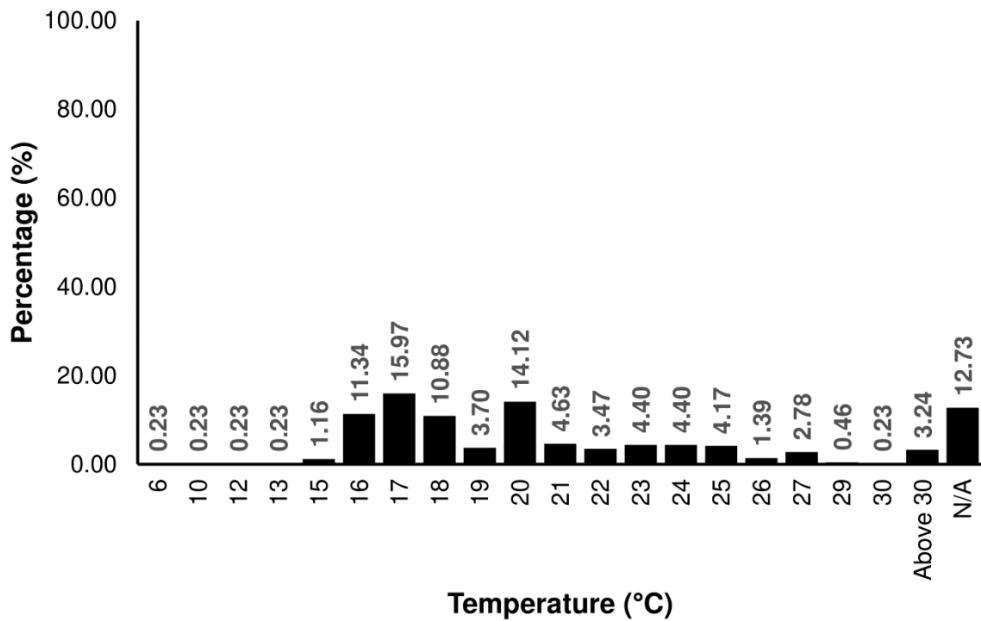
*Behavior/practices of students in the usage of Heating, Ventilation and Air Conditioning (HVAC) units*

The students' behavior in Table 14 shows that they have a high level of behavioral responses in using HVAC (Heating, Ventilation, and Air Conditioning) units. The respondents' highest responses when turning off air conditioning units were during vacation and at night. Meanwhile, turning off HVAC units for a few hours has the lowest mean score of 4.07 from the respondents.

**Table 14.** Respondents' behavioral practices towards the usage of Heating, Ventilation, and Air Conditioning (HVAC) units. (Never = 5, Rarely = 4, Sometimes = 3, Often = 2, Always = 1)

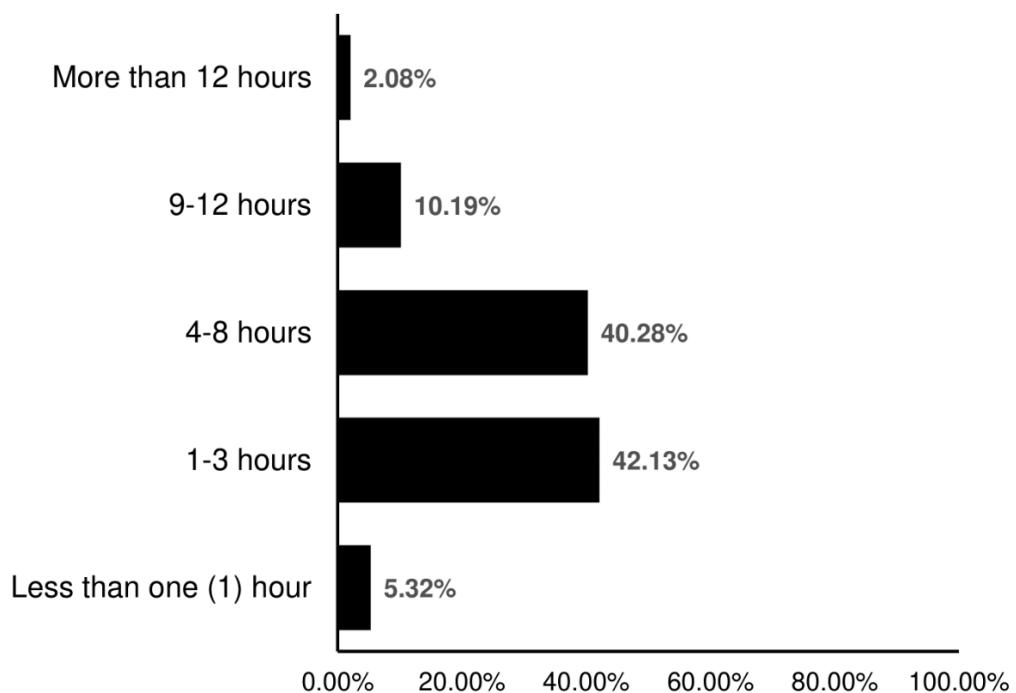
Questions	Mean Score	Interpretation
If you leave your office/classroom at lunchtime (12 noon), will you turn off your air conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.29	Always
When leaving your office/classroom for a meeting, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.38	Always
If you leave your office/classroom for a few hours, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.07	Often
If you leave your office/classroom for the night, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.70	Always
If you leave your office/classroom for vacation, will you turn off your air-conditioning? <i>(Assuming you're the only one in the office/classroom)</i>	4.77	Always

The temperature setting of air conditioning units among the respondents was also identified. The highest temperature setting that was applied in the air conditioning was 17°C (Figure 5). Meanwhile, other temperatures that had high responses were at temperatures of 16, 17, 19, and 20°C. Also, it was observed that 12.73% of the students responded N/A.



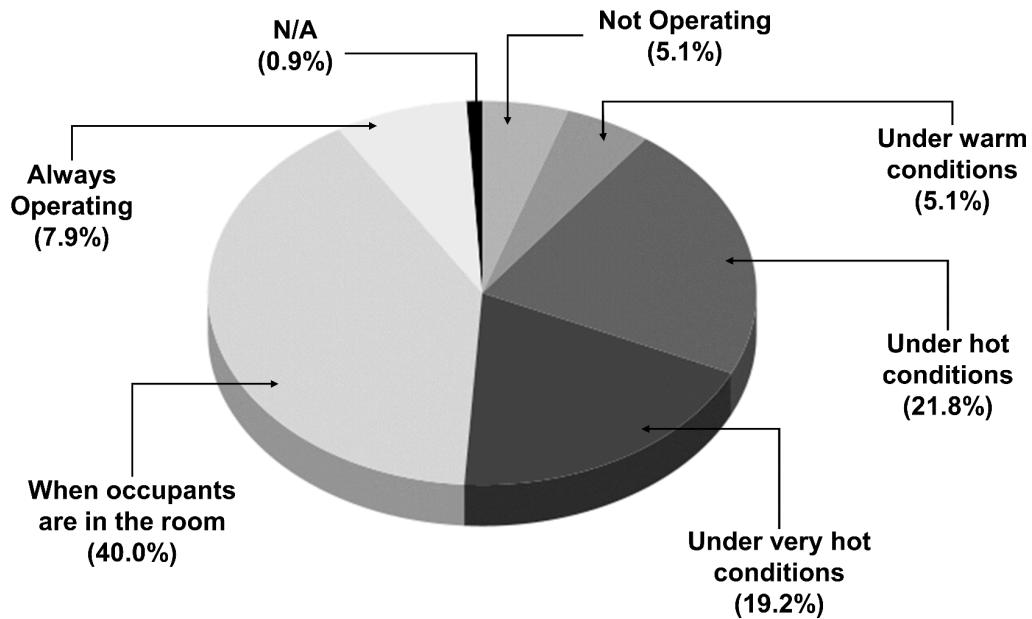
**Figure 5.** Respondents' daily air-conditioning units temperature (°C) ( $N = 432$ ).

Since most of the students used air conditioned units at low temperatures, this study also asked the duration of the air conditioned units was used. Figure 6 results show that most students surveyed say that the average hours of usage of air conditioning units in the campus are around 1-3 hours (42.13%) and 4-8 hours (40.28%). A small percentage of students were found to use air conditioning units in the campus at less than one (1) hour (5.32%) and more than 12 hours (2.08%).



**Figure 6.** Respondents' daily usage in hours of air-conditioning units.

The behavioral practices of the respondents in terms of their operating conditions of HVAC units was examined. Figure 7 shows that respondents switch on air conditioning units in the campus when there are occupants in the room (40%) and under hot conditions (21.8%). Nineteen point two percent used their HVAC units under very hot conditions. Interestingly, out of 432 students surveyed, only 7.9% had their air conditioning units always in operation.



**Figure 7.** Respondents' operating conditions of their air-conditioning units.

The results of the chi-square test to assess the relationship between the student's socio-demographic profile and their behavior/practices of HVAC units are presented in Table 15. There is a significant association between duration of using HVAC units and both college and year level ( $p < 0.05$ ). At the college level, operation conditions of HVAC units showed a significant association but there was no significant association at the year level. Similarly, the time of switching on of HVAC units at the college level resulted in a significant association but not at the year level.

**Table 15.** Association of behavior/practices towards HVAC with socio-demographic profile of students

Behavior	College ( $\chi^2$ )	Year Level ( $\chi^2$ )
Duration (in hours) of using HVAC units	48.1*	27.3*
Type of HVAC units used in classrooms during summer	66.1	36.2
Operation conditions of HVAC units	79.7*	32.4
Time of switching on of HVAC units	254*	113

*Note* \*  $p < 0.05$

*Relationship between HVAC behavioral patterns, existing energy conservation policies in MSU-IIT and attitude towards energy efficiency of students.*

To see if there is a difference between the attitude towards energy efficiency policies and the student's year level and colleges they represent, One-way ANOVA/Kruskal-Wallis was applied. Attitude has a significant difference among colleges, with a p-value of 0.003. Meanwhile, the year level of students showed no significant differences. Moreoever, it was found that there is a significant difference between perception towards energy efficiency and the year level of students ( $p < 0.05$ ) (Table 16).

**Table 16.** One-way ANOVA/Kruskal-Wallis results regarding the study variables by college and year level

Dependent Variable	Independent Variables	X <sup>2</sup>	F	df1	df2	p
Behavioral Practices	College	10.6		7		0.157
	Year Level	5.36		4		0.252
Attitude	College		3.65	7	53.7	0.003*
	Year Level		1.62	4	29.3	0.197
Perception	College	5.96		4		0.202
	Year Level	16		7		0.025*
Awareness	College	3.14		4		0.535
	Year Level	13.1		7		0.069

Note \* p < 0.05

To explore the relationship between variables, chi-square analysis was applied. Table 17 below shows that the student's behavioral practices towards the usage of HVAC units in the campus and attitude have a significant association ( $p < 0.01$ ). Also, there is a significant association between attitude towards energy efficiency and perception ( $p < 0.001$ ) and awareness of institute policies in relation to energy conservation practices ( $p < 0.001$ ). In the same way, the perception of the students towards energy conservation policies and awareness of the existing policies demonstrates a positive correlation ( $p < 0.05$ ).

**Table 17.** Chi-square analysis results of the different topics of the survey

	Behavioral Practices		Attitude		Perception		Awareness	
	X <sup>2</sup>	df	X <sup>2</sup>	df	X <sup>2</sup>	df	X <sup>2</sup>	df
Behavioral Practices	-							
Attitude	29.9 **	12	-					
Perception	24.2	16	8.63 ***	12	-			
Awareness	6.17	4	24.6 ***	3	10.4 *	4	-	

Note. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Energy consumption and energy conservation has been a challenge due to the rising human population (Sorrell, 2015) and climate change (Ascione, 2017). The study interviewed students of MSU-IIT by examining their perception and awareness towards existing institute's policies in energy conservation, their attitude towards energy efficiency, and also their behavior/practices towards the usage of HVAC units. The results showed that most of the students were well aware of the policy of MSU-IIT regarding energy conservation policies. Only 2 policies namely: "Regulated Air Conditioning Hours" and "Restriction on Personal Electrical Devices" were less aware of these policies but the margin between the aware and the unaware is small. In addition, the student's college and year level did not show any significant difference between awareness of the institute's energy conservation policies. Their awareness of these existing policies could play a factor when they are exposed to energy conservation activities prior to entering college. It was found out in a study that Filipino students who are exposed to science literacy during their

high school promotes engagement in energy conservation activities especially in their households (Aruta, 2018). This encourages college students to practice energy consumption activities due to increasing awareness that would eventually result in a lower energy consumption (Hassan et al., 2009). Also, the results demonstrate that university students have an overall positive response to the current energy conservation policies in MSU-IIT. A similar study by Shafei & Maleksaeidi (2020) also observed that since students are already at an age where they are able to discern that the current environmental status is unfavorable which allows them to support pro-environmental actions.

## **SUMMARY AND CONCLUSIONS**

This study presents the first phase of energy audit procedures at MSU-IIT. The results of this study reveal that academic buildings consume significantly more energy than other buildings included in the study. Among the academic buildings, the College of Science and Mathematics (CSM) - Main building was identified as the largest emitter of energy and greenhouse gas emissions. The diagnostic energy audit indicated that Heating, Ventilation, and Air Conditioning (HVAC) units were key contributors to electricity usage and greenhouse gas emissions. Also, the overall illuminance levels in the rooms under the selected buildings were identified as under illuminance. Only 12% of those rooms/offices successfully met the requirements of the Department of Energy (DOE) 2020 Guidelines, which underscores a critical need for improvement in compliance and efficiency. Seventy percent of the rooms with air-conditioning units maintained an acceptable indoor temperature; however, only 43% reached the recommended relative humidity levels according to the 2020 DOE guidelines. The survey revealed that students are generally well-informed about the institute's energy conservation policies. The respondents expressed a positive attitude toward supporting and participating in energy conservation initiatives on campus. However, it was noted that 63% of the students preferred setting air-conditioning units to low-temperature levels (below 21°C). This finding aligns with the indoor temperature test results, which indicated that the average temperature setting for HVAC units across all rooms was 20°C. Overall, these results underscore the importance of regular maintenance of HVAC units, replacing lighting systems with alternatives that maintain the same wattage but offer improved light output, and promoting energy-efficient practices to further reduce energy consumption at the university.

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## ANNEX

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

Operations Equipment	Building No.														
	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.

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).

Equipment	Building No.														
	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.

Laboratory Equipment	Building No.														
	Equipment	1	2	3	5A	5B	6	7	8	14A	14B	19A	19B	25A	25B
3D Printer	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
Air Compressor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Analytical Balance	-	-	-	-	-	-	-	-	7	8	-	-	2	-	-
Analytical Scale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Analytical Scanning Electron	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Angle Grinder	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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 D-12	-	-	-	-	-	-	-	-	-	-	-	-	-	1
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	-	-	-	-



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	-	-	-	-	-



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 Safety Cabinet	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Saito Ring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scanning Electron Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Shaker	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Shimamatzu 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	-	-	-	-
Spectrofluor ometer	-	-	-	-	-	-	-	-	1	-	-	-	-
Spectrophot ometer	-	-	-	-	-	-	-	-	2	1	-	-	-
Spectroquant Prove 300	-	-	-	-	-	-	-	-	1	-	-	-	-
Spectrum 100 Optica FT-IR Spectrometer	-	-	-	-	-	-	-	-	-	-	-	-	-
Stereo Microscope	-	-	-	-	-	-	-	-	2	-	-	-	-
Sterilizer	-	-	-	-	-	-	-	-	-	-	-	-	-
Stirrer	-	-	-	-	-	-	-	-	1	-	-	-	-
Stirring Hot Plate	-	-	-	-	-	-	-	-	1	-	-	1	-
Super Critical Fluid Extractor	-	-	-	-	-	-	-	-	-	-	-	-	-
Table Top Centrifuge	-	-	-	-	-	-	-	-	4	-	-	-	-
Tachometer	s	-	-	-	-	-	-	-	-	-	-	9	-
TGA 4000 Thermograv imetric Analyzer	-	-	-	-	-	-	-	-	-	-	-	-	-
Thermal Analyzer	-	-	-	-	-	-	-	-	-	-	-	1	-
Thermolyne TIUS	-	-	-	-	-	-	-	-	1	-	-	-	-
Toaster Oven	-	-	-	-	-	-	-	-	-	-	-	1	-
Top Balance	-	-	-	-	-	-	-	-	1	-	-	-	-
Top Loading Balance	-	-	-	-	-	-	-	-	2	-	-	-	-



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>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



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

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	Bulb	7	-	-	21	-	20	3	5	23	31	52	-	45	-	41
Bulb -													3	-	-	-
Chandelier		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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>		12	4	1	40	0	21	3	6	34	69	64	3	71	232	85

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



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).

Equipment	Building No.														
	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.





Hydraulics Bench	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrogen Trace Gas Generators	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Incubator	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Infinivision 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 Programma ble Boards	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Megger tester	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metalurgical Microscope	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micro Centrifuge	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Microscope	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Microscope Extension	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Milling Machine	-	-	-	-	-	-	-	-	-	-	1	-	-	-







Universal Testing Machine	-	-	-	-	-	-	-	-	-	-	-	-	-		
UPS	-	-	-	-	-	-	-	-	-	1	-	-	-		
UV-VIS Spectrophot ometer	-	-	-	-	-	-	-	-	-	-	-	-	-		
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>1</b>	<b>8</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>13</b>	<b>12</b>	<b>6</b>						

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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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		94.72	
2	OC - Boardroom	Under Illuminance	Under Illuminance	234.13	2 panel lights not functioning
2	OC - Hallway	Normal Illuminance		198.08	
2	OC - Chancellor's Office #1	Under Illuminance	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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
5B	OVCIA - Conference Room	Under Illuminance	Under Illuminance	211.62	
5B	OVCIA - VC's Office	Under Illuminance		121.17	
5B	Legal Office - Main	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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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		44.31	
6	OUR (Archive Section) - Outside Storage Area	Under Illuminance	Under Illuminance	16.93	
6	OUR (Archive Section) - Storage Area	Under Illuminance		38.90	
7	SID - Main Office	Under Illuminance		79.98	
7	SID - Director's Office	Under Illuminance	Under Illuminance	84.87	
7	SID - Pantry	Under Illuminance		50.21	
7	SID - CR	Under Illuminance		85.70	
7	MCR - Conference Room	Under Illuminance		149.26	
7	MCR - Director's Office	Under Illuminance	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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-section s (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
19B	B23 (Mini Leaning Commons)	Normal Illuminance	Normal Illuminance	410.82	
19B	B23 (Mini Leaning Commons) - Pantry	Normal Illuminance		279.78	
19B	C31 (Department of Filipino and Other Languages) - Entrance	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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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/MDSA	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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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
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	

Bldg #	Location/Station Name	Sub-sections (Illuminance Rating)	Whole Room /Office (Illuminance Rating)	Average (Lux)	Remarks
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	Cashering Division	23.84	65.29	25.37	89.10	21
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

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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	OVCRA					
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
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

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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					
14A	Department (Room 302)	27.53	65.03	29.07	81.42	16
14A	Chemistry					
14A	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

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
	Room 322	27.02	45.78	30.53	77.23	16
	Room 323	27.29	60.31	28.83	81.73	16
	Room 325&326	31.41	74.03	31.10	75.33	No AC
	Room 327&328	31.74	73.43	31.10	76.40	No AC
	Room 329	27.70	54.25	29.83	76.80	16
	Room 330	30.83	73.76	31.00	76.43	No AC
	Glass Room	29.01	77.87	29.13	79.03	No AC
	Museum	27.68	47.57	29.43	80.88	20
	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
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

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
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

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
19B	B23 (Mini Learning 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	
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
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	
25A	Room 114	29.62	76.55	28.53	77.60	
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	
25A	Room 207	26.59	62.89	28.23	75.37	18

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
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

Bldg #	Room Name	Inside Temperature (°C)	Inside Relative Humidity (%)	Outside Temperature (°C)	Outside Relative Humidity (%)	AC Temperature (°C)
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
25C	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