COVID-19 AND VENTILATION -GENERAL GUIDANCE AND FAQS

How Is COVID-19 Spread?

The most common way you can get COVID-19 (coronavirus) is by coming into close contact with someone who has the virus. You can spread the virus even if you do not have symptoms.

COVID-19 is primarily spread from the droplets that an infected person exhales from their nose and mouth or via airborne aerosols. These aerosols are smaller than the droplets and can travel further distances and remain airborne for longer periods which if inhaled by an unmasked person may infect them.

Why is ventilation important in helping to mitigate the spread of COVID-19?

COVID-19 can spread more easily in crowded or poorly ventilated areas. There are two main reasons why ventilation can be useful in limiting the spread of COVID-19:

1. The air movement or air turbulence created by ventilation causes exhaled droplets to fall from the air more quickly thus helping to reduce the risk that they will be inhaled by others.
2. Ventilation and the associated provision of fresh air into a space and the resultant air exchange also helps remove smaller aerosols which may be hanging in the air.
3. Additional air assists in dilution effect of any contaminants present in the air.

What is GMIT doing to ensure adequate ventilation?

Shared teaching and workspaces in GMIT have been reviewed and assessed by Buildings & Estates as to the type and extent of ventilation present, and the capacity to meet the WHO recommended adequate ventilation level of 10 l/s/person, with improvements commissioned as necessary.

To date (September 2021) circa €100k of ventilation improvements works have either been successfully completed or are on the way to completion as managed by Buildings and Estates and as approved by President and Executive board

What type of ventilation systems does GMIT deploy?

There are two types of ventilation within GMIT, **mechanical** and **natural** (some spaces operate a hybrid model of both mechanical and natural ventilation).

- **Natural Ventilation**

Natural ventilation is the introduction of fresh air into a space through natural means via an open window, grilles, louvres, slots etc (and in some cases an open door).

GMIT adopted a policy of natural ventilation where practicable circa 2000, and as evidence of this, the GMIT library volume, circa 30,000 cum is a very large naturally ventilated space. Any space that has an openable window has access to natural fresh air from outside i.e., is naturally ventilated. GMIT has been advising since early in the pandemic to keep windows open in all rooms that have windows when those rooms are in use.

- **Mechanical Ventilation***

Mechanical ventilation introduces air into a space via the use of a mechanical system. In general, larger teaching spaces, labs, workshops, toilets, and lecture theatres are mechanically ventilated, with supply and / or extract grilles fitted to the ceiling or walls.

Generally, GMIT mechanical systems operate on a full fresh air supply, with very limited recirculation of used air between breathing zones in different workspaces, i.e., fresh air is pumped from outside the building into a space and is then extracted and vented without being recirculated to the breathing zone of another space. In some areas there may be contained recirculation of air within the space for heating or cooling purposes. Some older supply systems which recirculated a small proportion of extract / used air have been modified and adjusted to supply fresh air only.

Whilst there is variation as to how different systems work depending on their age, it is important to note that 'used air' is not actively recirculated between the breathing zones of different working areas within GMIT buildings.

* A very small number of spaces in GMIT are fitted with locally controlled recirculating air conditioning systems. These can be recognised visually as large units mounted on ceilings or walls. These units generally work in conjunction with supply of fresh air and local recirculation to warm or cool this air for comfort purposes. If there is a supply of fresh air these systems can be used but in the absence of a fresh air supply, they should not be operated.

Mechanical Ventilation

Mechanical ventilation systems have been serviced and where necessary relevant components have been replaced.

All mechanically ventilated teaching spaces have been assessed for their capacity to provide adequate ventilation in line with REHVA COVID-19 guidance and WHO recommendations. Systems have been set to run at a higher rate (i.e., introduce more fresh air than usual) for longer periods than would normally be the case, both starting earlier in the day and running for longer periods in the evening where appropriate. Any systems with the potential for air recirculation between spaces set up to provide fresh air supply only

Any rooms outside these guidelines have been modified to improve ventilation or, have had their capacity reduced or have been removed from use. Where the ventilation of spaces has been modified this has been revalidated within the space and where necessary external specialist advice has been sought.

- Mechanical ventilation systems have been set up to provide a good supply of fresh air.
- Fresh air supply fans have been programmed to deliver a constant supply of between 10-12 litres per second of fresh air per person assuming a 100% occupancy rate in the space.

Mechanical ventilation systems are monitored via GMIT's Building Management System. This system allows Estates Services engineers to monitor the operation of the mechanical ventilation systems to ensure that they are functioning properly.

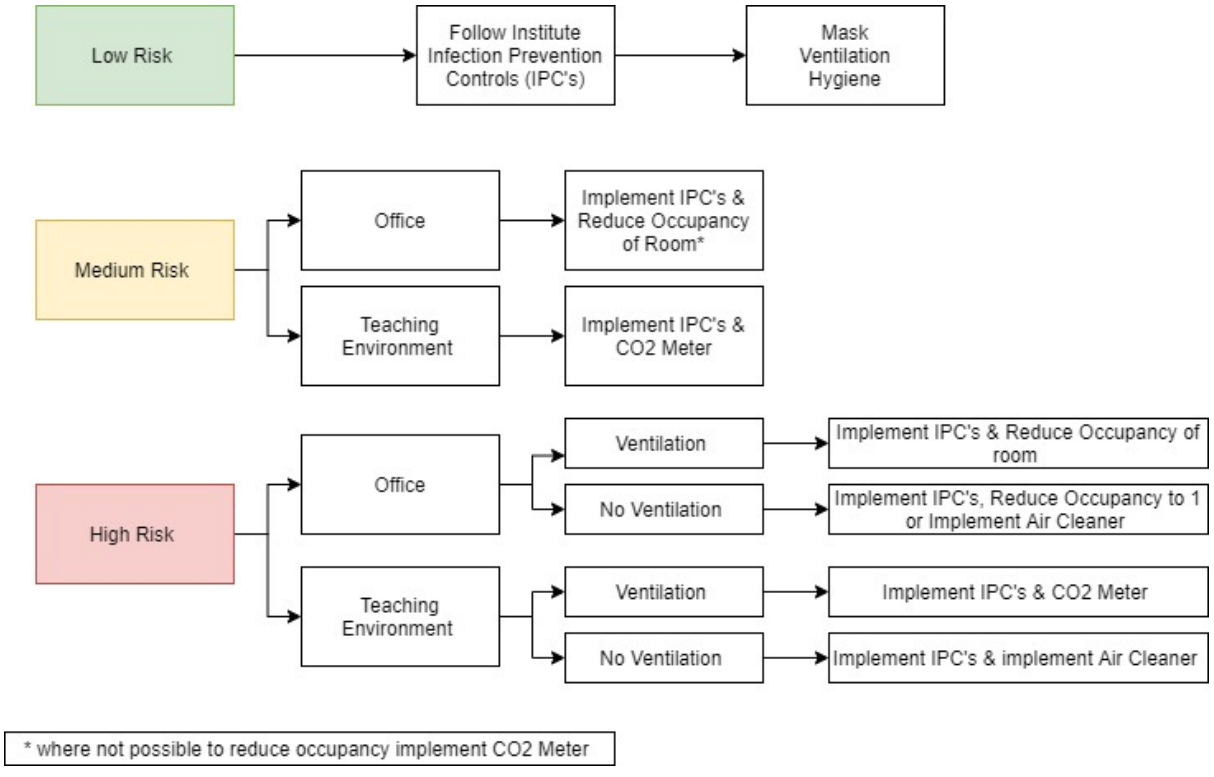
Natural Ventilation

Natural ventilation depends on the use of windows, grilles, slots, openings. Buildings and Estates services engineer has assessed the naturally ventilated teaching spaces and workspaces to ensure that there are openable windows present in every such space and that such windows are working correctly to allow for adequate ventilation.

The adequacy of natural ventilation has been assessed using the *2019 Building Regulations Technical Guidance Document Part F (Ventilation)*. This technical guidance sets out minimum requirements for naturally ventilated spaces to achieve adequate ventilation based on the relationship between window openings and floor space.

How can ventilation performance be monitored?

Advisers to Government have suggested that local Carbon Dioxide (CO2) monitoring can be used as a guide to determine air quality and provision of adequate ventilation. As humans exhale, they produce CO2; up to 4% of your exhaled breath is CO2, or 0.08 l of CO2/ sec / human. A build-up of CO2 in a space can be indicative of poor ventilation and consequently the measurement of same can be used as an indicator of freshness . It should be noted that CO2 levels are not linked to COVID-19 levels in a space, the CO2 level is an indicator of the rate of ventilation / air exchange from a space/ freshness of the space. The location of the monitor in the room should be at 4-5 feet from ground level and in a location away from direct expired air, windows/ doors/ fans.



Where will GMIT be using CO2 monitors to monitor ventilation?

Building & Estates have classified the various types of ventilation systems as follows:

Type	**Description**	**Local CO2 Monitor Required**
Mechanical – CO2 dependent	Mechanical systems with CO2 monitors fitted to the Library ventilation system that vary the flow rate of fresh air to maintain C02 levels below 1,000ppm in a space	Library Dublin Road
Mechanical- Constant rate	Mechanical systems that provide fresh air at a constant rate of 8-12l/s (sufficient to maintain C02 levels below 1,000ppm) per person assuming 100% occupancy	No
Naturally ventilated A	Areas where the calculation of window opening – floor space is in excess of that required under Technical Guidance Document Part F.	No Monitors will be available on a rolling basis to assess CO2 levels in these spaces and to validate the adequacy of natural ventilation as required.
Naturally Ventilated B	Areas where the calculation of window opening – floor space is in line with that required under Technical Guidance Document Part F but is not significantly over Or Naturally ventilated workspaces that are at a distance from windows or external doors	CO2 monitors will be placed in the space to assess ventilation during use. In addition, monitors will be available on a rolling basis to assess CO2 levels in these spaces if required.

How will local CO2 monitors work?

CO2 monitors will indicate the real time level of C02 in a space. Levels will fluctuate as persons walk past the sensors or combustion activity outside of the building varies, e.g., due to traffic levels. However, in line with best practice guidance the aim is to keep the CO2 levels at or below 1,000 ppm as much of the time as possible. It should be noted that background CO2 in the air ranges between 350 and 400ppm.

When located in the room the monitor should be at 4-5 feet from ground level and in a location away from direct expired air, windows/ doors/ fans.

Remember, CO2 levels do not indicate the presence or absence of COVID material in a space, they are a way of validating one of the control measures (i.e., ventilation) that is used to help reduce the risk from COVID. The wearing of face coverings also helps reduce the risk by trapping many of the droplets and aerosols produced by the wearer preventing them entering the air breathed by others.

What do I do if a CO2 level exceeds 1000 ppm ?

If a CO2 monitor exceeds 1000ppm then windows and doors should be further opened to increase the ventilation rate. If there is a window fan installed check if it is running and operating in the supply air mode. If there is a control box you may increase the fan speed to the maximum level. If a CO2 alarm is persistently activating, then contact buildingrepairs@gmit.ie and a member of the Building & Estates team will review
A CO2 1000 ppm level is not a reason to end a class, naturally ventilate the space to the greatest extend and this level should fall to circa 800 ppm.
If elevated levels of CO2 are found on a consistent basis in a space, then the use and occupancy of that space will be reviewed and if necessary modified by Building & Estates.

The wearing of masks in a space significantly reduces the amount of COVID-19 in the air.

CO2 monitors can and will register above 1000 ppm , particularly if people congregate in close proximity e.g., when filling into a space.

In the event that a local CO2 monitor indicates a high CO2 reading (or shows a red reading) the Lecturer should:

- Ensure that persons have not congregated close to the sensor
- Wait for short period of time to see if the level lowers
- If the monitor remains above 1000 ppm make sure windows are open fully
- If necessary open classroom door(s) temporarily to improve air flow.

Should CO2 levels remain high after these steps please contact buildingrepairs@gmit.ie for assistance.

What happens when centrally monitored (BMS) CO2 sensors indicate elevated levels of CO2?

If the BMS detects elevated CO2 levels, then the ventilation system will increase air flow / extraction rates if that functionality is available. If that automatic increase in ventilation rates is not available, then Building & Estates will send a resource to the classroom to check the CO2 levels on the ground and will ensure that the mechanical air handling system is working correctly.

Do I need to install an air purifier in a teaching space?

Building & Estates have reviewed teaching spaces and rooms with poor ventilation which have been modified or are removed from use. All rooms currently in use for teaching have adequate ventilation and consequently have no need for an air purifier.

Do I need to install an air purifier in a workspace?

The provision of adequate ventilation will be the objective in all workspaces. However, if there are spaces where this cannot be achieved the use of air purifiers will be considered if no alternatives are available. A risk assessment of the activity undertaken to include mask wearing compliance, number of persons in the area and length of time will be considered.

What can I do to improve ventilation?

In a naturally ventilated space:

- You should ensure that all windows are opened fully, and doors are also opened where practical for crossflow and dilution. This may result in a reduced temperature in some spaces.
- In a naturally ventilated classroom, you can ensure that all windows and doors are open when leaving the classroom so the space can refresh and leave the window fans running on supply air mode.

In mechanically ventilated spaces there is no need to open any windows or doors as the ventilation provided by the system is sufficient to achieve adequate air quality.

In mechanically ventilated lecture theatres, it is not necessary to prop open the doors in these rooms as the air handling ventilation units have been checked and are delivering adequate air for the stated room capacities. The systems are designed to distribute the fresh air evenly to all areas in the room space.

How are corridors ventilated?

Most corridors and access spaces rely on natural ventilation. Where there are windows in these spaces these should remain opened where possible.

In a small number of instances these spaces are mechanically ventilated where fresh air is supplied into the space.

Corridor doors should be left open where possible, however it is important not to prop open any fire doors as this would contravene fire regulations. Fire doors are easily recognisable as they will have a Fire Door Keep Closed label attached to the door. Some fire doors are fitted with special ‘door hold open’ devices (which automatically release/close the door when the fire alarm is activated). These should be left in the open position.

What is the rationale in reducing the lecture time to 50 minutes?

This is to allow students and faculty time to circulate safely between lectures and for students who have consecutive lectures in the same classroom to go outside and remove their masks for a time and get some fresh air if desired. It also provides some additional time for faculty to set up their lectures for lecture capture.

If the class before me in the lecture theatre does not exit promptly, must I ensure my class waits for 15 minutes before entering?

This is not necessary as the ventilation in classrooms is designed to deal with 100% occupancy on a continuous basis and there are sufficient air exchanges whilst the room is in use to ensure adequate ventilation.

However, to minimise contacts between students, lecturers should encourage students to leave the classroom promptly at the end of class.

What to do if I have a query re. timetabling or ventilation?

Queries about the timetabling,(timetable@gmit.ie) nature and type of ventilation in a particular space can be directed to the covid officer on covidofficer@gmit.ie and buildingrepairs@gmit.ie