







	<b>UNIVERSITY OF CAPE TOWN</b>		
	<b>COVID-19 Guideline</b>  <b>Ventilation and Capacity assessment for Departmental Spaces</b>	Reference Number	PAS / COV / 002
		Implementation Date	January 2021
		Rev / Amendment No	Rev 5.0
	Rev / Amendment Date	05 January 2021	



**Ventilation and Capacity assessment for Departmental Spaces**


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	TITLE	DATE	SIGNATURE
<b>OWNER:</b>	Nominated University OHS Specialist Brent Proctor	Jan 8, 2021	
<b>REVIEWED BY:</b>	COVID-19 OHS Committee Chair – Michael Langley/Nave Naidoo	Jan 8, 2021	
<b>REVIEWED BY:</b>	Chair HAWG - Dr. David Coetzee	Jan 8, 2021	 <small>DJCoetzee (Jan 8, 2021 10:25 GMT+2)</small>
<b>REVIEWED BY:</b>	Director OHS – Kirshni Naidoo	Jan 8, 2021	
<b>APPROVED BY:</b>	Executive Director P&S -Mughtar Parker	Jan 8, 2021	
<b>APPROVED BY:</b>	Chief Operating Officer -Dr Reno Morar	Jan 8, 2021	 <small>Reno Morar (Jan 8, 2021 11:56 GMT+2)</small>

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## 1. Introduction

As Faculties and Departments prepare for the gradual and controlled return of students and staff to Campus in 2021, there has been growing concern around adherence to COVID -19 regulations regarding venue capacity and ventilation requirements.

In addition to universal COVID-19 precautionary measures such as the wearing of cloth masks, maintaining physical distancing of 1.5 meters and sanitizing regularly there are number of factors to consider when it relates to venue occupancy. The type of ventilation; floor layout design and activity in the room need to be considered when determining the occupancy rate.

It is for this reason that a Ventilation and Capacity guideline and assessment tool have been developed to enable a reasonably practicable approach in determining the occupancy rate for departmental spaces.

## 2. Purpose

The purpose of this guideline is to provide a supporting framework on the implementation, monitoring and review of an interactive assessment tool used in determining occupancy rates for departmental spaces.

## 3.Scope

The guideline and respective assessment tool are intended for interpretation by the designated Faculty or Departmental responsible person for Departmental spaces and the appointed Faculty/Departmental Covid Compliance Officers. The guideline and tools exclude centrally booked venues that are managed by Properties and Services (P&S). The guideline also incorporates support services staff such as Occupational Health and Safety; Maintenance and Operations and Space Management that reside within P&S.

## 4. Implementation

For the successful and sustainable implementation of the tool it is imperative that there are:


- Clearly defined roles and responsibilities
- A clearly defined process of identification of spaces, analysis and resulting operational protocols within that space.
- Guidance on use of the tool and its application to various university spaces
- Regular monitoring and evaluation of the effectiveness of the guidelines and respective tool based on comments from users

### 4.1 Roles and Responsibilities

#### a. COVID Compliance Officer Roles and Responsibilities

(The designated responsible person in managing COVID compliance within Faculty/Department)

- Ensure that all COVID-19 precautionary measures are implemented within department/Faculty
- Ensure that all communications from OHS Committee/appropriate forums are promptly conveyed to responsible person within the Department /Faculty that includes the designated venue responsible person

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- To actively participate in the review of the guideline and tools and communicate effectiveness of the tool at the OHS committee meeting.
- b. P&S Roles and Responsibilities
- To provide support in space management (Liesle van Wyk contact no. 021-6503466)
  - Assessment or guidance on implementation of COVID-19 precautionary measures (Michael Langley contact no.021 6503552/Brent Proctor contact no.0662263462)
  - Guidance on use of tool (OHS-Brent Proctor contact no.0662263462)
  - Maintenance and Service of ventilation systems that fall under the services of P&S (Christo Odendaal contact no. 0216503834)-it must be noted that if faculties/department opt to directly outsource these services then it falls outside the ambit of P&S
- c. Faculty/Departmental Designated Venue Responsible Person Roles and Responsibilities (Responsible person may include tutors; lecturers, student or student representatives)
- Needs to familiarise oneself with the guideline and tool.
  - Needs to establish the type of ventilation system within various departmental venues. (refer to section 5)
  - May consult with P&S Maintenance and Services if ventilation system is managed by P&S otherwise with service provider directly.
  - Establish original occupancy rate for selected venues or refer to Space Management (Liesle van Wyk)
  - Follow instructions provided by the COVID Compliance Officer regarding display of notices and all COVID-19 Precautionary measures
  - To evaluate and monitor efficiency of tool and communicate to respective Covid Compliance Officer.

Please note that with regards to natural ventilation the level of comfort within the room will be weather dependent and that the principle of reasonable practicability be applied. Under extreme weather conditions it is advisable to either seek alternative venues that follow the guidelines of this document; reduce the time spent in the venue, or if no other alternative is found postpone classes.


CO2 monitors may also be independently sourced for an indication of level of adequate fresh air supply from various suppliers (e.g. Cygnus contact details Peter Dobson [Peter.Dobson@cygusics.com](mailto:Peter.Dobson@cygusics.com); tel 021-9143731)

#### 4.2 Monitoring and Evaluation

Apart from regular email or responses of users on the tool's performance, a standard item on the agenda at the COVID-19 OHS Committee Meeting will be dedicated to the evaluation of the tool from the various departments/faculties.

### 5. Background Information on Ventilation

Indoor ventilation is an important consideration regarding viral transmission; correctly applied it can reduce spread. Conversely, poor ventilation promotes viral transmission. The odds of transmission in an international study show that COVID-19 spread was 18-fold higher in an enclosed environment than in an outdoor environment.

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- It should be noted that this guideline is based on a reasonable scoring in response to information collected from various sources and a level of reasonable application.
- Furthermore, all standard COVID-19 precautionary measures are to be maintained as a constant factor, this includes the wearing of masks, hand sanitisation and 1.5m social distancing.

Indoor air quality management relies on the permutations of:

- Ventilation: natural / artificial (“mechanical”)
- Air conditioning, which comprises
  - Heating / cooling / dehumidifying
  - Air filtration

Installations typically apply these permutations in various combinations. Hence a room may use natural ventilation (open window) with a locally installed air conditioning unit.

### 5.1. Different types of Ventilation

#### 5.1.1) Naturally ventilated buildings

These buildings, spaces or rooms rely on ventilation to an external opening (window, door or flue. In this case the opening must meet the minimum surface area requirements of 5% of the floor surface area. When occupied, all openings must remain open.

#### 5.1.2) Artificially (“mechanically”) ventilated buildings

This category of ventilation comprises a centrally located air handling unit (fan) and ducting which carries the air to various parts of the building. The volume of fresh air delivered to the building is critical.

Artificially ventilated buildings are typically fitted with heating, cooling, and air conditioning – see Heating, Ventilation and Air Conditioning (“HVAC”) systems below.

If buildings have artificial ventilation, then operation of the system should aim to deliver 15L/s/person of outdoors air. This equates to approximately 12 air changes per hour.

CO<sub>2</sub> can be measured as an indicator gas to help ensure ventilation systems are delivering the recommended minimum quantities of outside air to the building’s occupants. This guideline for office ventilation during COVID-19 further asserts that indoor CO<sub>2</sub> concentrations in a fully occupied workspace should not exceed 400 ppm above outdoor CO<sub>2</sub> concentrations. Practically this equates to approximately 800ppm and it follows that this value can be used as a standard. When CO<sub>2</sub> readings exceed 800ppm, it is a measure of poor ventilation, indicating that corrective action is necessary.

### 5.2 Air conditioning


#### *Buildings with air conditioning (heating, cooling & dehumidification) systems*

Use of the term “ventilation” in the previous section indicates that the system is able to introduce fresh outdoor air. Air conditioning systems do not, in themselves, introduce fresh outdoor air – to do this they must be coupled to a ventilation system.

#### 5.2.1 Heating, Ventilation and Air Conditioning (“HVAC”) systems:

These typically have the following features:

- One or more centrally located air handling unit(s) (AHUs) which circulate the air through a system of ducts, throughout the building (for minimum volumes of air required, see artificial ventilation above).

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- They introduce fresh air (known as “make up air”) into the building at proportions that can be adjusted to values appropriate to the activities in that building (typically 30% - 70% make up air, but even up to 100% is possible). The lower the proportion of make-up air, the easier it is to maintain a building’s thermal requirements but increases the risk of recirculating aerosols – and vice versa.
- They have built-in air conditioning (adjustable heating, cooling and dehumidification) mechanisms. Various standards prescribe indoor temperature & humidity settings for optimum comfort.
- They have air filters to clean airborne particulate contaminants. These filters are available in various forms and filtration efficiencies. The filtration efficiency should be suited to the activities in that building.

#### 5.2.2 Split unit air-conditioners (“Terminal Unit”)

This is the most common type of heating and cooling system although it is not able to introduce outdoor air. If this type of heating and cooling system is used, then there are two scenarios:

- If there is a supplementary mechanical ventilation system, (using either exhaust or supplementary ventilation), it must be determined whether the system is designed to deliver 15L/s/person of outdoor air and also whether the system achieves this air supply rate in practice. There may be a number of reasons for a ventilation system to underperform relative to designed flow rates.

## 6. Ventilation and Capacity Assessment Tool

P&S is responsible for all Central Venues that are available on the Centrally Booked System.

For all other venues, the permutations outlined above must be optimised, as far as reasonably practicable by the venue user. To facilitate this, UCT has developed a Ventilation and Occupancy Rate guideline and tool by which unit managers /venue responsible persons can assess the indoor air quality interventions within the areas of their responsibility.


No venue may be used without prior verification against the Ventilation and Occupancy Rate guideline and tool.

Drawing from the above, the following permutations are included in the spreadsheet tool:

- Ventilation: natural / artificial (“mechanical”)
- Air conditioning, which comprises
  - Heating / cooling / dehumidifying system
  - Air filtration type
- Frequency and duration of occupancy

The tool also takes into consideration the 1.5m social distancing mandated by the regulations of the Disaster Management Act.

Based on the input, the tool will assist the user (Covid Compliance Officer or designated Faculty/Dept venue responsible person) to identify the allowable occupancy rate.

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### 6.1 Completing the guideline tool

(Please contact Brent Proctor (brent.proctor@uct.ac.za) for support/assistance)

- a) Add the Venue details to Column A-D
- b) Use the drop-down tabs to answer the headings
- c) In Column 'AE', add the maximum number of persons that would be able to use the room under normal conditions outside of COVID-19.

[Click here to view scorecard](#)