tefma INC

TERTIARY EDUCATION FACILITIES MANAGEMENT ASSOCIATION (TEFMA) INCORPORATED

SPACE PLANNING GUIDELINES

Edition 3

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FORWARD

Space is one of the major assets of higher education institutions and, on average, represents around 20% (capital and operating expenditure) of their operating costs. While this incurs a major cost to institutions, the availability of appropriate space is essential to support their teaching, research and community service objectives. Also, the provision of appropriate space is becoming even more important as institutions increasingly compete for students and funding.

The management of space is therefore a key foundation of the asset management strategy for any institution.

This third edition of TEFMA's Space Planning Guidelines represents a further step forward in the provision of essential planning information for use by Facilities Managers in the higher education sector. It builds upon the first and second editions, which were issued in 1998 and 2002 respectively. The first and second editions have been tested in practice and opportunities to improve the quality of the data were identified. While it is clearly recongnised that 'one size does not fit all', these guidelines present an excellent basis from which to start to assess space requirements, provide quality advice and develop benchmarks.

The production of these guidelines has only been possible through a lot of hard work by a number of TEFMA members. Thirty four institutions contributed data, without which the space standards would have been far less accurate. Particular thanks, goes to the editorial panel consisting of Sandra Jones (Chair and Space Planning Consultant) Tom Hunt, Darren McKee, Michael Scott, Barbara Robinson. Joan Rodriges, Andrew Trotter, Garry Bradley, Terry Young, without whom this publication would not have been possible, Mark Bradley, TEFMA Director, who co-ordinated, initiated and project-managed the publication.

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INTRODUCTION
TEFMA SPACE PLANNING GUIDELINES

These Guidelines have been specifically developed to provide a base recommendation with clearly defined parameters, which can either be used per se or adjusted and adapted to suit various known situations as they exist in differing campus locations. An example of this is the mix of teaching and research done in universities and the possible absence of research space in Polytechs and TAFE Colleges. To improve credibility of bids for space it is strongly recommended that proposals simply based on norms be avoided. Reports should be augmented by an overview of requirements taking into account the "needs" of an institution, faculty or department reviewed at the local level. This third edition is structured similarly to the previous publications, with three main sections providing advice on User Group space based on student and staff load, Guide Utilisation Ratios, and General Space Standards based on room type, with definitions of commonly used terms provided. In preparing capital development feasibility studies, there will be a need to convert useable floor areas (UFA) to a gross floor area (GFA). This process has not been addressed in these guidelines.

Whilst each building type requires individual assessment, this ratio is reported in total campus terms in TEFMA's annual benchmarking report as a guideline. However, further research on this and other gaps in the detailed space recommendations will enhance a future edition of these guidelines.

Space management is the process by which administrators and managers are provided with information on space utilisation and space needs to make significant facility planning-related decisions in a cost effective manner. Specifically, space management is the systematic method of inventorying, allocating, planning, designing and maintaining space, equipment and furniture for general or special-purpose facilities that are subject to such needs as flexibility or an accommodation for future growth. Flexibility, functionality and efficiency require an effective space management system, for which space planning is an effective tool.

The purpose of this guide is to provide members with a useful tool for space planning and to define and coordinate the necessity and extent of space planning needs on a case-by-case basis and to ensure efficient and effective use of space in the most economical manner while meeting the institution's space requirements.

Space management continues to be an essential element in total asset management, providing an opportunity for greater utilisation of space and minimisation of capital programs, reducing recurrent operating costs and providing appropriate solutions to client accommodation programs.

The successful outcome of a space management program is enhanced if institutions embrace parameters in a policy document which can be custom designed from guidelines, such as these, to meet individual strategic plans. This is highly recommended at an institutional level.

Please note: In Section 2 – 2.2.1 Academic Space – Broad Academic Category (ASCED), and 2.2.2 Narrow Academic Category (ASCED), there are two figures shown as UFA m² / EFTSL, one in black that represents the original 2002 data and one in blue that represents 2008-2009 updated data. This has been necessary because of the lack of survey data received from institutions for this category and will be updated in the future.

It is important for TEFMA Members to consider that to be provided with accurate benchmarking data it is necessary that you to keep the appropriate Space Management records and participate in TEFMA surveys.

Concept and design of the front cover was kindly supplied by USC staff.

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1.0 SPACE MANAGEMENT

A Space Management System needs to be underpinned by a Space Management Policy. The Institution needs to own and support the Policy for it to be effective.

A Space Management System needs an accurate computerised Space Management Inventory Program to achieve successful and accurate space planning.

The Space Management Inventory system should be compiled by means of a numerical/descriptive data dictionary that forms the basis of a computerised program.

An overall computerised Space Management System is recommended by the introduction of several modules.

- **Space Management Inventory Module**
- **Space Management Reporting Module**
- **Space Planning Module (e.g. Indicative Space Model)**

Space Management Inventory Module

A Space Management Inventory Module should ideally compromise the following categories and ideally be linked to the other modules.

- **Campus details with unique campus codes, linked to**
  - Campus Name
  - Campus location
  - Campus area – hectares
- **Building File/ Table**
  - Unique Building Code
  - Building names attached to a Building code, linked to Room details file
  - Building details such as -
    - Building condition
    - Building sustainability / environmental details
    - Ownership and Funding details
    - Total Gross Floor Area
    - Total Useable Floor Area
    - Capital Replacement Value
    - Disability Access
    - Insurance Value
- **Supplementary Building File/Table (Optional)**
  - Lift Type and size (Building or multiple lifts per building)
  - Air Conditioning (generated by a specific plant room for the building)
  - Natural Ventilation (provided to an entire building or part of building)
  - Emergency Power generation available
  - Floor File/Table (Optional)
    - Floor ID
    - Floor GFA

        - Floor UFA
- **Room File/Table**
    - Unique Room Number prefixed by Building code
    - Room Type code *(Room Types are listed in Section 3.2)*
    - Room Function code *(Room Function types see Section 3.3)*
    - Room Condition code
    - Room Area m² - total of room area to aggregate back to Building file
    - Useable Floor Area m² - total of usable room area to aggregate back to Building File/table
    - AOU – Academic Organisation Unit Code – Faculty
    - AOU - Academic Organisation Unit Code - School
    - AOU - Academic Organisation Unit Code - Department
    - Occupant's name (Needs to be able to enter multiple names)
    - Number of Office Users (FTE)
    - Disability Access compliant

- **Supplementary Room File/Table** (Optional)
    - Details of furniture
    - Number/capacity of workstations
    - Number/capacity of teaching / meeting seats
    - Number/capacity of computers and type
    - Number/capacity of printers/ copies/ faxes and type
    - Number/capacity of laboratory spaces within labs
    - Projectors/ AV equipment
    - Door sign detail (optional)
    - Fittings
    - Paint colours
    - Floor coverings etc
    - Lifts attached to particular rooms (ie Service)
    - Air Conditioning attached to a particular room
    - Natural Ventilation attached to a particular room

Note: While it is not imperative to collect data against all these categories, when a Space Inventory Module has the capability of collecting data against all categories, it assists in future planning as one can track what buildings and rooms are "disability compliant" and the "room condition" etc for Capital and Maintenance planning.

Ideally, to have a complete Space Management System, it is best to have the relational databases linked to CAD floor plans to provide accurate areas and graphical printing.

Space Management – Reporting Model

A Space Management Reporting Module should have the ability to run, view and print reports on any of the above categories in the Building, Supplementary Building, Room and Supplementary Room file tables.

- The reports should be able to be 'user defined', with the ability to view and change parameters on the screen before a report is printed. The reporting tool should include the normal range of charting options.

- All reports should be auto dated with (where applicable), aggregated Building Gross Floor Area, Room Size and Room Useable Floor area UFA, sub totalled and totalled by the category requested. (Eg, by Building or an AOU code within a building or several buildings).

- Changes in either of the UFA or room size should be aggregated back to the Total Building size, UFA and Room size in the Building file.

- Reports should be able to be exported into Word, Excel or PDF files to enable them to be attached to an email.

- Ideally, the Reporting Module could be linked to the institutions EFTSL (Student) and FTE (Staff) data.

- Links could also be established between the Space Inventory, Timetabling System, Finance System and TEFMA Benchmarking Reports if required. *This however, would require considerable Information Technology intervention and would come at a cost.*

Space Planning Model

A Space Planning Model (Indicative Space Model) is a management tool that enables a standard indicative space envelope to be determined for each academic organisation unit (AOU) based upon each academic organisational unit staff and student categories and numbers and disciplines.

A Space Planning Model is predicated on the following principles:

- Different disciplines will require different amounts of space
- Different categories of staff will require different amounts of space
- Students at different levels will require different amounts of space.

Section 5 of the SPG – Indicative Space Modelling provides a guide for the above amounts of space. However, the amounts of space allocated in any space planning model can be made "institution specific" based on what has worked previously in the institution or what it will need in the future, due to changing pedagogy. Also, benchmarking over time can provide an indication of trend in these areas.

Space Planning used as a Management Tool

A Space Planning Model (Indicative Space Model) can be used as one element of the decision-making processes in relation to new capital building proposals, reconfiguration and refurbishment of existing buildings and allocation of space across faculties/schools and other University or Higher Education Institutional activities.

Comparison of Indicative to Actual space usage

Using the Space Planning Reporting Module the Space Manager can compare actual space allocation with the results of the Space Modelling providing further evidence of how the University's / Institutional space is being used.

These calculations can be used as a guideline to predict space needs in Faculties, Schools and Departments.

In addition, further detailed physical investigation along with consideration of the Institution's Strategic Plan is recommended to finally determine space needs.

Space Management System currently used by TEFMA institutions

Section 6 of the SPG lists the space management inventory systems used by TEFMA Members.

2.0 HIGH LEVEL RATIOS FOR GENERAL PLANNING PURPOSES

INTRODUCTION

This section discusses the broad ratios that can be used for Higher Education Institutional planning. In essence, they are simply an amount of space typically attributed to a particular institutional use, based on student load.

The ratios and data tables have been assembled from the TEFMA 2007 Benchmark Survey, (Ref 1) TEFMA 2008 Space Planning Guideline Survey (Ref 2) and planning data generally available within the Higher Education Institutional sector.

This section has been updated to reflect feedback from Institutional Members on the 2nd Edition of the TEFMA Space Planning Guidelines and the TEFMA Space Planning Editorial Panel, however it would benefit from further regular feedback and benchmarking between the TEFMA Institutions.

Most would be familiar with the terms GFA, UFA, EFTSL and FTE, however it is worth providing some definition from the outset, as space and student loads need to be correctly interpreted and quantified to provide meaningful results when applying the ratios.

- GFA (Gross Floor Area m^2). As defined in the TEFMA Benchmark Survey, i.e. the sum of fully enclosed area and unenclosed covered area.

- UFA (Useable Floor Area m^2). As defined in the TEFMA Benchmark Survey, i.e. floor area measured from the inside face of the walls and deducting all the common use areas (corridors, etc) and non-habitable areas (lifts, stairs, service ducts etc). **Note**: corridors provided within 'open plan' offices are considered to be useable floor area, UFA.

- Ratio of UFA to GFA.
  UFA is normally expressed s a percentage of the GFA
  A rule of thumb is that the UFA represents 60% to 70% of the GFA of a building. (Ref 1)

- EFTSL (Equivalent Full Time Student Load). A value representing the student load for a unit of study or part of a unit of study, expressed as a proportion of the workload for a standard annual program for students undertaking a full year of study in a given year of a particular course.

- FTE (Full Time Equivalent) A value for measuring staff resources. Like student EFTSL it is a measure as compared to a standard full-time workload.

THE OVERALL PICTURE

In planning it is often useful to take the macro view of the campus and then drill down to seek more detailed information.

When conducting campus master planning, reference to broad ratios based on student load can provide a quick overview to the size a campus could attain in a fully developed form.

2.0.1 –
TOTAL UNIVERSITY AND INSTITUTIONAL GROSS FLOOR AREA (GFA) AND USABLE FLOOR AREA (UFA) m² / EFTSL

For a broad 'rule of thumb' planning parameter, 14-15m² GFA/EFTSL would be considered an Australasian average for University and other Higher Education Institutional space. This ratio covers all space on a campus except for student housing (Ref 1)
Also see table below for Ref 2 data

Useable Floor Area (UFA) is typically 60 - 70% of GFA, (Ref 1) and currently equates to an average of 9.4 UFA/ EFTSL as shown in the table below (Ref 1)

TEFMA Higher Education institutions fall into the following broad groups of space holdings.

RANGE OF SIZES OF INSTITUTIONS GROSS FLOOR AREA (GFA)

	LOW	MID	UPPER
GFA/EFTSL (Ref 1)	< 12m²/ EFTSL	12 to17m²/ EFTSL	> 17m² / EFTSL
% of University campus in range	33%	46%	21%

RANGE OF SIZES OF INSTITUTIONS USABLE FLOOR AREA (UFA)
The % range is too broad to show in 3 ranges and was spread across 6 ranges to show the current variances in TEFMA Higher Education Institutions

	LOW	LOW	MID
UFA/EFTSL (Ref 2)	**< 6m²/ EFTSL**	**6 to 8m²/ EFTSL**	**8 to 10m²/ EFTSL**
% of University campus in range	10%	33.4%	13.3%
	MID	**UPPER**	**UPPER**
UFA/EFTSL (Ref 2)	**10 to 12m²/ EFTSL**	**12 to 17m²/ EFTSL**	**> 17m²/ EFTSL**
% of University campus in range	20%	20%	3.3%

RANGE OF INSTITUTIONS SHOWING STUDENT EFTSL TO FTE (ACAD) STAFF

	LOW	MID	UPPER
Ave EFTSL/ FTE (Academic) (Ref 1)	19.1	16.4	11.4

A number of factors can contribute to the variation in GFA/EFTSL, and UFA/EFTSL between universities and Higher Education institutions.

These include:

- The different mix of courses and weighting of disciplines that require specialist facilities (such as science laboratories or a medical school).
- The ratio of staff to students. The table above shows the average EFTSL/Academic FTE in each range.
- Duplication of facilities in multi-campus universities and Higher Education institutions.
- The larger GFA & UFA of an institution the higher m² / EFTSL.

- In many cases the larger institution conducts more research which is more space intensive.
- Location – regional versus urban campus versus suburban
- Efficiency of usage of existing facilities
- A higher m^2/EFTSL ratio does not necessarily produce a better educational experience. If facilities are used efficiently and rooms are being fully utilised then additional facilities (UFA) may not be needed.

References:

The data used in this section has been derived from the following sources:

Ref 1: TEFMA Benchmark Survey Report 2007

Ref 2: Based on TEFMA SPG Institutional Survey in November 08
(*34 institutions responded*)
Section 6 shows the list of respondents.

Ref 3: AAPPA Space Planning Guideline data 2002

Ref 4: TEFMA 2nd SPG Institutional Survey results for Sections 2.1, 2.2, 2.2.1 and 2.2.2. July 2009 with 2008 to 2009 data provided.
(*10 Institutions responded to the survey*)
Section 6 shows latest respondent list.

2.1.
TYPES OF SPACE

The other broad parameters which are useful relate to types of space on campus and the breakdown of academic space against faculties or discipline groupings.

Typically a University or Higher Education Institution is made up of the following Groupings:

- Academic space (including dedicated teaching and research space, Academic and General Support Offices).
- Central Administrative support space.
- Centrally timetabled teaching space (Lecture Theatres, Seminar and Tutorial rooms).
- Library Space Including Study Centre and Computerised Student Work Spaces, Info Commons, etc.
- Student and Staff Services space, including Counselling Guild and Sport and Recreation facilities.
- Commercial space, including Space leased or rented to others, Bookshop, Cafeteria.
- Other - any thing not included above including transition & vacant.

2.1.1 - TYPES OF SPACE % ACROSS CAMPUS

Type of Group Space **2008 – 2009 Data** (Ref 4)	**% of total space on Campus**	**m² UFA /Total Campus EFTSL**
Academic, Includes Teaching, Research, Acad Offices and Acad General Support Offices, Dedicated Teaching Rooms and Laboratories	42% - 66% An average of 46.8%	2.1 - 9.5m² UFA / EFTSL An average of 5.2m² UFA / EFTSL
Central Administrative Support Services	6.7% - 16% An average of 11.97%	.6 - 1.5m² UFA / EFTSL An average of 1.12m² UFA / EFTSL
Centrally timetabled teaching space, Lecture Theatres, Seminar and Tutorial Rooms etc	3.2% - 16% An average of 9.4%	.5 - 2.02m² UFA / EFTSL An average of .93m² UFA / EFTSL
Library Space Includes Study Centre and Computerised Student Work Spaces, Info Commons etc	3.6% - 16% An average of 8.5%	.4 – 1.64m² UFA / EFTSL An average of .91m² UFA / EFTSL
Student and Staff Services Includes Counselling, Careers, Medical, Guild, Sport & Recreation etc	3.4% - 10% An average of 5.9%	.2 – .75m² UFA / EFTSL An average of .57m² UFA / EFTSL
Commercial Space leased or rented to others e.g. Bookshop, Cafeteria etc	2% - 14% An average of 4.81%	.1 - 1.85m² UFA / EFTSL An average of .51m² UFA / EFTSL
Other Anything not included above including, transition & vacant	.8% -11.1% An average of 5.19%	.1 – 2.9m² UFA / EFTSL An average of .75m² UFA / EFTSL

2.1.2 - LIBRARY SPACE

Overall provision for library space on a campus is typically in the order of .5m² - 1.5m² UFA / EFTSL (Ref 4).

Other parameters, which may help in sizing a library facility, include:

- Open stack space / 1000 volumes 6m² UFA, based on standard library book stacks, 5 shelves high + 900 corridor (Ref 3).
- Closed stack space / 1000 volumes 3m² UFA (Ref 3).
- Reserve collection space/ 1000 volumes 17 to 18m² UFA (Ref 3).
- Private study, reader space and collaborative space 0.1 to 0.8m² UFA / EFTSL (Ref 3).
- Additional Specialist reader space (e.g. Law, Medicine) 0.8m² UFA / EFTSL (Ref 3).

The concept of a library building is continually changing due to evolving methods of providing, managing and delivering information resources to students and the community. Detailed planning needs to take these changes into account.

2.1.3 - CAFETERIA SPACE

Overall provision for the main student dining area (internal space) for a campus cafeteria is in the range of 1.0m² - 2.4m² / EFTSL. (Ref 4)

The kitchen and other ancillary spaces (stores, cool rooms, etc) associated with the main dining hall is approximately 50 – 70% of the area of the dining hall. (Ref 3)

A new concept for Eateries that is emerging from University Master Planning has seen a move to smaller cafés and outdoor eating areas. These areas also provide for informal meeting space and the introduction of wireless technology also enhances the use of these spaces for both staff and students.

External cafeteria / eating space used for informal learning experience can be set up at 2 to 3m² UFA per EFTSL or FTE. (Ref 4)

2.2 ACADEMIC SPACE

Academic space constitutes about half the space on a typical campus. Within the grouping of Academic space, there can be a further breakdown according to the Australian Standard Classification of Education (ASCED) Code used for reporting Institutional Statistics to the Department of Education, Employment and Workplace Relations (DEEWR).

The updated data was compiled from a TEFMA Survey taken in July 09, of which 10 TEFMA Institutions responded. (Section 6 shows list of respondents). These updated figures are suggested as a TEFMA guideline for general planning.

Note: TEFMA plan to further survey the following Broad and Narrow Categories of Academic Space to glean a more representative spread of data.

The guide ratios are useful for an initial assessment of needs for Faculty/ Department / Discipline dedicated space. In each case the University or Higher Education Institution needs to have the current EFTSL figures for a Faculty, Department or Discipline. This figure can be divided into the total m² UFA for that Faculty /Department or Discipline to calculate the **m² UFA / EFTSL.**

The ratios shown in the table refer to 'dedicated' faculty space (UFA). The term 'dedicated' refers to space which is primarily used by one Faculty, Department or Discipline and does not take into account the central pool of Timetabled teaching space.

2.2.1 BROAD ACADEMIC CATEGORIES (ASCED)

Note: Ref 3, Figures shown in black below are the original 2002 AAPPA data that have not been updated due to a lack of responses from a recent Survey to TEFMA Institutions.

Ref 4, figures are shown in Blue and represent 2008 – 2009 data taken from July 09, TEFMA Institutional Survey.

Broad Academic Category ASCED Code	**m² UFA / EFTSL** (Ref 3) 2002 Blue Figures (Ref 4) 2009
01 - Natural and Physical Sciences	10 8
02 - Information Technology	2 4.5
03 - Engineering and Related Technologies	10 6.7
04 - Architecture & Building	6 8
05 - Agriculture, Environmental & Related Studies	5
06 - Health	14
07 - Education	3 3.7
08 - Management & Commerce	1 1.3
09 - Society and Culture	3.5 2.1
10 - Creative Arts	6 6.1
11- Food, Hospitality and Personal Services	6.5
12 - Mixed Field Programs	Insufficient data

The above broad categories can be further broken down to Narrow Academic Categories and be customised to suit a particular University / Higher Education environment.

In this way, an institution can assess the relevance of the ratios to local campus planning and adapt ratios over time.

2.2.2 NARROW ACADEMIC CATEGORIES (ASCED)

Note: Ref 3, Figures shown in black below are the original 2002 AAPPA data that have not been updated due to a lack of responses from a recent Survey to TEFMA Institutions.

Ref 4, figures are shown in Blue and represent 2008 – 2009 data taken from July 09, TEFMA Institutional Survey.

Narrow Academic Category ASCED Code	**m² UFA / EFTSL** (Ref 3) 2002 Blue Figures (Ref 4) 2009
01 - Natural and Physical Sciences	
Mathematical Sciences	3 2.8
Physics and Astronomy	12 12
Chemical Sciences	17 13
Earth Sciences	10 11.3
Biological Sciences	11 10
Other Natural Sciences	10
02 - Information Technology	
Computer Science	2.5 4.1
Information Science	2 3.5
Other info. Technology	2
03 - Engineering and Related Technologies	
Manufacturing Eng and Technology	10
Process and Resource Engineering	11
Automotive Engineering and Technology	8.5
Mechanical & Industrial Engineering & Technology	14
Civil Engineering	16
Geomatic Engineering	7
Electrical & Electronic Engineering & Technology	7.5 9.1
Aerospace Engineering and Technology	Insufficient data
Maritime Engineering & Technology	Insufficient data
Other Engineering and Related Technologies	10
04 - Architecture and Building	
Architecture & Urban Environment	7 6.1
Building	6 6
Other Architecture and Building Studies	Insufficient data
05 - Agriculture, Environmental & Related Studies	
Agriculture	2
Horticulture	2
Forestry Studies	6
Fisheries Studies	Insufficient data
Environmental Studies	11
Other Agriculture, Enviro & Related Studies	5
06 – Health	
Medical Studies	14 11
Nursing	3 2.5
Pharmacy	7
Dental Studies	16
Optical Science	5
Veterinary Sciences	18

Narrow Academic Category ASCED Code	m² UFA / EFTSL (Ref 3) 2002 Blue Figures (Ref 4) 2009
Public Health	5 5
Radiography	4
Rehabilitation Therapies	6
Complementary Therapies	8
Naturopathy	8
Other Health	10
07- Education	
Teacher Education	3 3.5
Curriculum & Education Studies	3 2
Other Education	3 2
08 - Management & Commerce	
Accounting	1 1
Business Management	1 1.8
Sales & Marketing	1.5 1.3
Tourism	1.5
Office Studies	1 1.7
Banking, Finance & Related Fields	1 1.6
Other Management & Commerce	1
09 - Society & Culture	
Political Science and Policy Studies	1.5 1.8
Studies in Human Society	2 2.2
Human Welfare Studies and Services	2 2.1
Behavioral Science	4 5.4

Narrow Academic Category ASCED Code	m² UFA / EFTSL (Ref 3) 2002 Blue Figures (Ref 4) 2009
Law	1.5 1.6
Justice and Law Enforcement	1.5
Librarianship, Information Management and Curatorial Studies	3.5
Language & Literature	2.5
Philosophy & Religious Studies	2 2.6
Economics & Econometrics	1 1.6
Sport & Recreation	7.5 10.2
Other Society & Culture	3.5 3.6
10 - Creative Arts	
Performing Arts	7 7.3
Visual Arts & Crafts	13 14.5
Graphic Design & Studies	6
Communication & Media Studies	2 2.4
Other Creative Arts	6 5.9
11 - Food Hospitality and Personal Services	
Food & Hospitality	6.5
Personal Services	Insufficient data
12 - Mixed Field Programs	Insufficient data
General Education Program	3.5
Social Skills Programs	Insufficient data

See next page for references

References:
The data used in this section has been derived from the following sources:

Ref 1: TEFMA Benchmark Survey Report 2007.

Ref 2: Based on TEFMA SPG Institutional Survey in November 08 (*34 institutions responded*) Section 6 shows the list of respondents.

Ref 3: AAPPA Space Planning Guideline data 2002.

Ref 4: TEFMA 2nd SPG Institutional Survey results for Sections 2.1, 2.2, 2.2.1 and 2.2.2. July 2009 with 2008 to 2009 data provided. (*10 Institutions responded to the survey*). Section 6 shows latest respondent list.

2.3 CAR PARKING SPACE

A broad ratio for the provision of car parking on a campus is in the order of 1 bay for each 4 to 5 EFTSL.

This ratio should be used with care as there are a number of factors that impact on the ratio and will vary the requirements for individual campuses.

These include:

- Locality (city, metropolitan, country)
- Available public transport
- Institution's Environmental Policy
- Other parking options off campus
- Student demographics
- Available space on campus

GUIDELINE FOR THE METHODOLOGY FOR USING THE CLASS TIMETABLE TO ASSIST IN THE MANAGEMENT OF TRAFFIC AND PARKING

Calculate the maximum number of motor vehicles that can be accommodated on the campus, say at 9am. This includes staff and students.

For example: If there are 4,000 parking spaces and 2,000 are used by staff then there will be 2,000 spaces left at 9am. Assuming that most students who drive cars do not car pool, means that the Space Manager or Traffic Manager doesn't want any more than 2,000 students who drive, taking classes at 9am. (If travel audits are undertaken it will be know how many students travel by public transport each day).

Add the 2,000 students or the institution's calculations) to the number of students travelling by Public Transport. This will give the total number of students that should be allowed to study in the 9am to 10am time slot. (Peak time can be adjusted).

The time of day that causes parking and traffic problems will usually be known. For example, if the assumed combined figure of students who drive, walk or travel by public transport represents 5,000 students, request the Class Timetable Manager to only allow classes from 9am to 10am that calculate to a total of 5,000 students.

This can be worked out by calculating how many persons the institution's teaching spaces hold and timetabling classes up to a maximum of 5,000 students for the 9am to 10am time slot.

Then request that the Timetable Manager to block out the left over teaching space in the 9am to 10am time as TRAFFIC MANAGEMENT. This will limit the number of cars that come onto campus in this critical peak period.

Resistance may be experienced at first but attitudes will change as students and staff who formerly complained they could not get to their office or class on time because they could not find a parking space on campus or could not enter the campus because of grid lock at the entrance will soon see the advantage of the new process.

Give incentives to classes who change from 9am to 8am by giving them preference to specific teaching rooms. Maybe an in-house Media campaign is an ideal way to start.

The manipulation of the Class Timetable to add "Traffic Management" bookings **has to be undertaken when compiling the timetable for the following year.**

This method was used by the University of Newcastle for 4 years up to the compilation of the 2005 timetable and has greatly improved traffic and parking on campus.

3.0 ALLOCATIONS, STANDARDS AND BENCHMARKS

INTRODUCTION

Space Management is about the accurate recording of space, planning, using space modelling, the application of benchmarks to measure how well space is being used and referencing local, state and national legislative standards i.e. the BCA, to plan for future needs.

Space data collected through space information systems and room utilisation audits are compared to established allocation guides, standards and benchmarks to:

- Obtain an understanding of how well space is being utilised.
- Assist with the equitable distribution of available space.
- Identify areas of improvement.
- Plan space required for Schools, Department, Disciplines and Positions.
- Plan for future growth of students and staff.

ALLOCATIONS & STANDARDS

Allocation guides are a 'bottom up' approach and define the area required to perform a particular function, activity or position. For example, area standards can be allocated for an academic office or a teaching room for a certain number of students.

Allocations are based on functional requirements for particular activities and **are usually well established through precedence, testing over time and the design process.** Changes to area allocation for a particular activity are usually difficult to make and mostly result from a review of how the function is carried out or from new design approaches. For example, the use of computers and the development of system workstations have changed the standards for office design in recent times. In particular extra space requirements to provide for disability access.

Standards may be a legislative requirement, local, state or national. They may also be set by the institution.

BENCHMARKS

Benchmarks are a 'top down' approach and are used to get a big-picture view of how space is used. Benchmarks are usually applied at a broad level for comparison purposes.

For example, the m^2 (UFA) Useable Floor Area per student can be compared across universities. This can be useful for assessing how much improvement is possible and in planning for future expansion for new courses or student growth.

SPACE MODELLING

Modelling is the application of standards to known or planned activities to arrive at an internal benchmark for planning purposes.

For example, if the number of academic staff and students for a particular course are known, then standard areas formulas can be applied to calculate the total area required for that course.

The Space Planning Model is outlined in Section 5 of the SPG Publication.

3.1 ALLOCATION and DESIGN GUIDELINES BY SPACE TYPE

Individual institutions set their own allocation and design standards.

Individual institutions can use the following space norms to create their own standards or to assist with space allocation or in a review of their existing standards.

An emerging trend for part-time and visitor space made possible by advances in technology is that a lot of casual space can be offset by off site access to the University network

Notes: For allocation of office space

- If existing office space is available it is expected that it will be allocated and used.
- These guidelines are suggested for the construction of new office space and they do not define or create an entitlement when promoted.
- UFA refers to Useable Floor Area m².
- Open plan is becoming an option that most institutions are working towards.
- The Building Code of Australia states in Section D1.13 that the minimum size of an enclosed office is 10m².
- Note: Space allocated in a laboratory does not necessarily mean a separate laboratory.
  To calculate the size of a lab for a specific department/discipline/unit, refer to Space Planning Modelling in Section 5.

ACCOMMODATION FOR ACADEMIC, ADMINISTRATIVE, RESEARCH STAFF AND STUDENTS

Office Space and Open Plan Guideline	**Office size m² UFA**	**Space allowance used to calculate space in Lab - m² UFA**
Senior Executive staff who need to hold regular meetings in their offices eg: Vice Chancellor	28-35	16
Senior staff who need to hold regular small meetings (up to 6 people)	20-28	16
Heads of School, Research or Administration Units who need to hold confidential discussions (up to 4 people) eg: Professor, Head of Department, or Snr Exec Staff	16-20	16
Staff, who need to hold confidential discussions (up to 2 people)	14-16	16
Staff who need single closed offices but need extended storage for personal books or equipment used in the course of their work	12-14	16

Office Space and Open Plan Guideline	**Office size m² UFA**	**Space allowance used to calculate space in Lab - m² UFA**
Full time Academic, Research or Administrative Staff (deemed to require single closed offices)	10-12	16
Lecturer or full time Research Officer	10-12	16
Part time Staff shared office	8-10	8
Open plan workspace, meeting space	8-10 per person	8
Visiting Academic staff (Use office of staff on ext leave)	Also has option of accessing network externally	
Research Fellow, Post Doctorate Fellow	2 per 12m² office space or 8m² in open plan	8
Postgraduate Research students Honors and PGCW at Faculty's discretion	2 - 4m² per student in shared room	6
Research Assistant	6m² Open plan or shared office	6
Undergraduate student teaching space (Normally timetabled teaching space	2m² per student within class room	
Common or Tea Room (To create size of room)	2m² per person	

Office Space and Open Plan Guideline	**Office size m² UFA**	**Space allowance used to calculate space in Lab - m² UFA**
Meeting Room (To create size of room)	2m² per person seated	
Computer Room/Lab (This allows for disabled access) Desk to be at least 1 mtr wide x 800mm deep	3.5m² per EFTSL To create size of the room	
Academic Laboratories		
Staff Research Laboratory	16m² per FTE to create lab size	
Scientific teaching laboratory (incl's fume hood)	5 – 6m² per EFTSL	
Student Ancillary Space For workshops, prep rooms or laboratory store rooms	40% - 60% of total usable lab space depending on discipline (See Section 5 of SPG)	
Ancillary Allowance for all Staff space Provides space for printers, photocopiers etc	10% - 30% of the total useable area depending on size of the unit	

3.2. ALLOCATION and DESIGN STANDARDS BY ROOM TYPE

Room Type describes the nature of the room and how they support the primary functions of the institution:

- Office either closed or open plan
- General teaching theatres and rooms
- Laboratory Facilities, Scientific, Medical, Engineering, Computing and Studios
- Ancillary Area (Preparation space and storeroom),
- Information Service – Library
- General Facility (Committee, Meeting, Child Minding, Counselling Services etc
- Student Residential Accommodation
- Non usable floor area.

The Room Type category is normally used as a criterion with a code when setting up a data dictionary for Space Management Inventory recording. A suggested Room Type Code has been provided in an attempt to bring some standardization to TEFMA reporting.

The following table lists typical room types and space standards used in the sector.

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Office Accommodation	**Guide-line**	
Office / Open Plan Faculty staff	See Section 3.1	101
Office / Open Plan Research staff	See Section 3.1	102
Office / Open Plan Honours / Post Grad Students	See Section 3.1	103
Office / Open Plan Technical Laboratory or Store	See Section 3.1	104
Office / Open Plan Professional Staff	See Section 3.1	105
Office / Open Plan Category undefined	See Section 3.1	106
Office / Class Room/ Teaching Studio (ie Music) (Informal teaching, predominantly an academic office)	12 – 14 dependant on need (ie Piano)	107
Office / Open Plan Administration	See Sect 3.1	108

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
General Timetabled teaching space –	**Guide-line**	
Informal learning spaces such as Courtyard areas etc – external	2 - 3	200
Lecture Theatre (>100) Stepped floor – raked seating. Incl area at the front of theatre.	1.7 – 1.8	201
Lecture room/ Seminar / Tutorial/ Class Room (15 < 70 seats – flat floor)	2.0 See note at bottom of grid	202
Case Study Theatre (70 <100)	2.0	202
Seminar Service room -General teaching area – Lecture Theatre	2.0	203
Teaching area – not defined	n/a	204

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Laboratories		
Laboratory Student Information - Commons - Computing	3.5	300
Scientific / Medical / Engineering Laboratory - *Undergraduate* including fume hood Store & prep area	5-6 1.0	301 404
Scientific / Medical / Engineering Laboratory - *Postgraduate* including fume hood Store & prep area	5-6 1.0	302 404
Laboratory – Drawing Office – Architecture/ Engineering / Design	See studios	303
Laboratory Computing Undergrad (Provides for disabled access)	3.5	304
Laboratory Computing Post-Grad (Provides for disabled access)	3.5	305
Laboratory – Audio Visual Teaching Room	2	306
Laboratory – Clinical areas – Psychological & Anthropology For Training students in the examination and treatment of People or animals	5	307
Laboratory – Gymnasium Human Movement Dance	3.6 - 5	308

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Laboratory – Language & Statistics Used for training students in a language other than their native language	2	309
Music Practice Rooms - Teaching (Single use rooms)	8m² per room size	310
Laboratory - Undergraduate Training non scientific	2.0	311
Laboratory Facility Research only	See Section 3.1 or Section 5	312
Studios	**m² UFA per Student**	
Drawing Studios, Architecture, Town Planning, Engineering	2.8 / student (1st year) 2.2 / student (2nd, 3rd, 4th)	313
Design Studios postgraduates	2.8 / student	314
Sculpture, Metal Studio Store	5 / student 1/ student	315
Ceramics Studio Store	6/ student 1student	316
Ancillary Area		
Ancillary Area with specific type not defined	1.0	400
Ancillary Area – Laboratory Service Preparation	1.0	401
Ancillary Area – Instrument Room	1.0	402

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Ancillary continued		
Workshop within a laboratory	4.0	403
Heavy Engines, Machine Tool and Similar Store and Prep area	9.0 1.0 – 1.3	403 404
Strength of materials, electrical machine, building Store & Prep area	6.0 1	403 404
Ancillary Area - Store & Prep areas	1.	404
Ancillary Area – Display area, museum	1	405
Ancillary Area – Glass House	1	406
Ancillary Area – Animal Accommodation	Insufficient Info	407
Ancillary Area – Mail Room – Goods Receipt / Dispatch	Insufficient Info	408
Ancillary Area Flammable Liquid Store	Insufficient Info	409
Ancillary Area Cold Rooms – Constant Temp Rm	Insufficient Info	410
Ancillary Area Darkroom	4	411
General Facility		
General Facility type not defined	Insufficient Info	600
Committee, Conference, Meeting Room	2	601
Service Room for above Meeting etc	1	602
Printing, Photocopier Room	2 Or equip	603
Common Room	2	604
Dinning Hall, Café, Canteen (Internal)	1 – 2.4	607

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Kitchen , Service Food Storage	Insufficient Info	608
Lounge / Recreation Room	Insufficient Info	609
Indoor Sporting Facility	Insufficient Info	610
Commercial or Business facilities	Insufficient Info	611
General Facility – Theatre – Used for dramatic, music and film presentations not associated with teaching	1.8	612
Great Hall or large flat floor assembly area Used for Examinations	2.0 3.0	613
Dressing Rooms / Theatrical Gymnasium	2m² per person	614
Music Practice Rooms – Used in conjunction with theatre	8m² per room size	614
Medical Facility – Where Medical and Counselling Services are available to staff and students	6.4	615
Careers and Employment Centre		616
Child Minding Centres	Insufficient Info	617
Religious Meeting Place	2.0 – 2.1	618
Information Service - Library		
Information Service Category – not defined	See Section 2.1.2	500
Reading Room	See Section 2.1.2	501
Private Study	See Section 2.1.2	502

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Audio Visual Room	See Section 2.1.2	503
Open Stack	See Section 2.1.2	504
Closed Stack	See Section 2.1.2	505
Compact Stack	See Section 2.1.2	506
Remote Stack	See Section 2.1.2	507
Library Service – Area accommodating staff in areas such as Reader Service, Reference Services, Cataloguing, Acquisitions	See Section 2.1.2	508
Department Library Eg: Special collection	See Section 2.1.2	509
Local Computer Room	See Section 2.1.2	510
Student Residential Accommodation		
Staff	See Section 3.1	701
Head or Chief Executive	See Section 3.1	702
Caretaker, Curator	See Section 3.1	703
Accommodation - Apartment	Insufficient Info	704
Bed Study	10/ student	705
Lounge	2 / student	706
Dining/ Kitchen	1.5 / student	707
Ablutions	Insufficient Info	708
Laundry	Insufficient Info	709
Common Room	2 / student	710

ROOM TYPE	m² UFA / EFTSL or FTE	RT CODE
Tutor/Warden suite (kitchen/living/study/ bed/ bath & toilet	30 -60	711
Non Usable Area Floor Area		
Not Specifically defined		800
Circulation		801
Tea Room		802
Toilets & Rest Rooms		803
Change & Shower Rooms		804
Cleaner's Room		805
Garage & Loading Bay	$10m^2$ per vehicle	806
Mechanical Plant Room		807
Mechanical Service Riser		808
Sub Station		809
Switch Rooms		810
Electrical Riser		811
Communication Riser		812
Data Riser		813
Hydraulics Riser		814
Fire Service Riser		815
Lift Motor Room		816
Other Plant Room		817

Note:

The design standards for space allocations should be taken as guidelines only. However, they are based on the empirical experience of University planners working in the field, and influenced by published standards over many years of operation in Australia and New Zealand. Local Regulations and Standards related to specific space requirement, especially laboratories should always be checked.

3.3 ALLOCATION BY ROOM FUNCTION

Room Functions describe the activities in the room and how they support the primary functions of the institution. For example, an academic office supports Teaching and Research functions whilst an office for a Catering Manager supports Staff and Student Services.

Room Function category is normally used as a criterion with a code when setting up a data dictionary for Space Management Inventory recording.

Room Function is generally defined as below and does not necessarily have space allocated to the function.

The Room Function and Code are only suggestions for use when building a computerised Space Management Program.

In Section 5 of the SPG, Space Modelling Functions are allocated with space to create an "Indicative envelope of space" for the purpose of planning space for new academic areas.

Room Function	Suggested RF Code
Academic Function not defined	10
Academic – Teaching	11
Academic – Research	12
Academic – Teaching and Research	13
Academic Function – Academic Administration	14
Academic Function – Other Academic Activities	19
Central Academic Support Services Function with specific nature not defined	20
Central Academic Support - Library	21
Central Academic Support - Computing	22
Central Academic Support – Audio Visual Service	23
Central Academic Support – Other	29
Staff & Student Services function with specific nature not defined	30
Staff & Student Services – Student Union	31

Room Function	Suggested RF Code
Staff & Student Services – Staff Club	32
Staff & Student Services – Including Accommodation, Careers, Employment, Counselling, Medical etc.	33
Staff & Student Services – Staff Associations , Unions	34
Staff & Student Services – Food Services, Refectory	35
Staff & Student Services – Sports & Recreational	36
Staff & Student Services – Child Care (Note: Set up covered by State licensing)	37
Staff & Student Services – Other – (excl, residences)	39
Residential Function with specific nature not defined	40
Staff & Student Services – Staff residences	41
Staff & Student Services – Student Residences	42
Residential – Other Res	49
Public Services , Broadcasting, Continuing Education etc.	50

Room Function	Suggested RF Code
General Institution and Administrative Services – with specific function not defined	60
General Institution and Administrative Services – Central Administration	61
General Institution and Administrative Services – Other General Administrative Services	69
Buildings/Grounds/ Workshops	70
Non Useable	80
Amenities – Toilets etc	90

4. SPACE UTILISATION

4.1 Room Audits and Audit Data

Conducting room audits is an integral part of measuring Space Utilisation Rates. Room auditing involves counting the number of students using the various teaching facilities within a university: this is generally undertaken over all the operating hours for the campus for one week each semester. The data collected via room auditing is collated as Room Frequency and Room Occupancy (see below).

Room Audit data gives an indication of the actual use of an institution's facilities, and should be used in conjunction with room booking and class enrolment data. This data is a useful asset when attempting to grasp the use of facilities within an institution.

Accurate information about the rooms within an institution is an integral part of successful room auditing. Information regarding room use, room types, room ownership and room capacities is required to enable thorough examination of audit data.

Audit Data

Typically, audit data is analysed using the following performance indicators:

Room Frequency (RF):

Room Frequency is the number of hours the room is in use during the audit period, divided by the number of hours that the room is available for use during the audited period.

$$RF = \frac{HoursUsed}{HoursAvailable}$$

Hours Used = the number of hours the room was in use during the audit period.

Hours Available = the maximum number of hours the room could be used in the audit period.

For example:
Room in use: 40hrs
Room available for use during audit period: 50hrs

Room Frequency = $\frac{40hrs}{50hrs}$ = 80%

Room Frequency pertains to the room being physically in use, not the theoretical use as recorded as bookings on a room booking or scheduling system.

Room Occupancy (Occ):

Room Occupancy represents the average number of students in the room when the room is in use, compared to the total room capacity. Room Occupancy is independent of Room Frequency.

$$Occ = \frac{TotalStudents}{Capacity \times HoursUsed}$$

Total Students = Total number of students counted in the room over the audit period.

Capacity = the maximum number of students the room can hold, usually based on the number of seats in the room.

Hours Used = the number of hours the room was in use during the audit period.

For example:

Total number of students counted in room: 800
The capacity of the room: 80
Number of hours room is in use: 40hrs

Room Occupancy = $\frac{800}{80 \times 40}$ = 25%

As Room Occupancy is dependent on the accuracy of Capacity, and Capacity is generally an approximate measure (particularly in spaces other than classrooms and lecture theatres), Room Occupancy data can be misleading.
Room Occupancy levels above 100% can occur.
A Room Occupancy level in excess of 100% may be due to either overcrowding or reflect how the facility is being used, eg.

• A laboratory space may be being used as a convenient seminar space between laboratory classes. The number of students may exceed the room's listed capacity as a laboratory.

Another concern with Room Occupancy data is the difference between students enrolled in a course and the number of students attending the classes. Rooms must be booked to allow for every enrolled student to attend the class, even if this rarely occurs. In these cases low occupancy may not be an issue with the facilities provided.

Utilisation (U%):

U% = RF x Occ

For example:

Room Frequency: 80%
Room Occupancy: 25%

Utilisation = 80% x 25% = 20%

Utilisation combines Room Occupancy and Room Frequency data to give an indication of the how the room is being used. Utilisation, as an abstract measure, is only useful as an indicator of rooms requiring further investigation of usage patterns, and comparative assessments.

4.2 Space Utilisation Rates

Typical university day
It is recognised that there is no standard 'typical day' at universities in the Australasian region. This is particularly so in relation to the level of use made of evenings in the delivery of programs. Therefore, to enable greater potential for benchmarking, it is recommended that in undertaking utilisation audits, the audit results should be presented in terms of daytime / evening and overall utilisation.

For the purposes of utilisation the following standards are recommended for formulation of room frequency, occupancy and utilisation rates:

Recommended Typical Day / Week

	Hours per day	Hours per week
Typical daytime session	8.00am – 5.00pm	45 hours (9hrs x 5 days)
Typical evening session	5.00pm – 9.30pm	22.5 hours
Typical overall week		67.5 hours

The indicative space utilisation rates appearing below are based on a typical overall week of 67.5 hours.

Theoretical utilisation
This is a notional concept and is not intended as a practical performance measure.

It is possible to calculate a theoretical utilisation (TU) rate for a facility:

$$TU\ \% = \frac{SCH}{Capacity \times HoursAvailable}$$

SCH = School Contact Hours to be delivered

Capacity = Sum of room capacities

Hours Available = Total number of hours for which the rooms are available for room use over the period in which the SCH are to be delivered (eg. 1 semester = 13 weeks x 67.5 hrs per week).

It is possible to use theoretical utilisation as both a maximum possible achievable utilisation, as it assumes all classes are attended, and a planning tool for new facilities.

For example:
SCH: 150,000
Capacity: 5 rooms of 40 = 200
Hours available: = 13 weeks x 67.5hrs = 877.5 hrs

$$= 200 \times 877.5 = \frac{150{,}000}{175{,}500} = 0.86$$

=enough space available

Indicative Space Utilisation Rates [1]			
Space Type [2]	**Target Room Frequency**	**Target Room Occupancy**	**Target Utilisation**
Lecture Theatres - large (250+ seats) - medium (180 - 249 seats) - small (60 - 179 seats)	75%	75%	56%
Teaching - large flat floor teaching areas (non-theatre) - classrooms - tutorial rooms	75%	75%	56%
Computer Laboratories [3]	75%	75%	56%
Specialist Laboratories [4]	50%	75%	37.5%
Workshops [4] - engineering, metalwork, woodwork, psychology, children's studies	50%	75%	37.5%
Studios - architecture, painting & drawing, sculpture, ceramics, textiles, printmaking, dance, drama	75%	75%	56%
Practice Rooms - dance - music	80%	75%	60%
Meeting Rooms [5]	45%	75%	34%

Notes:

1. The Space Utilisation Rates shown in the table above are indicative only and are based on a typical overall week of 67.5 hours.

2. Given the disparate space types used by institutions throughout Australasia, the Space Types used in this table are intended to be broad/generic descriptors.

3. Many universities operate some Computer Laboratories on a 24 hr/7 day-a-week access basis. Calculation of utilisation of these facilities is recommended as being calculated, in the first instance, for the standard typical overall day hours of operation. A utilisation result may also be determined for the 24hr/7 day-a-week use (168 hrs a week availability). However, due to the distortions that are likely to apply to results from this approach, it is recommended that this data result be kept separated from the typical overall day data and used for internal purposes only.

4. Laboratories and Workshops have a lower frequency of use rate than lecture theatres or teaching areas due to the requirement to provide set-up and additional cleaning time for these areas.

5. Meeting rooms have been calculated as having a low frequency of use due to their use being largely associated with the daytime operation of a University. It is anticipated that evening use is minimal.

4.3 Analysis of Space Utilisation Data

Percentage of room use chart

Figure 1 is an example of a typical Percentage of Room Use Chart. The data indicates the percentage of used spaces for lecture times across the audit week: percentage of rooms used is equivalent to the average Room Frequency for the selected spaces.

By examining the data in this form, a greater understanding of the trends in room usage can be grasped: this example indicates that late morning and early afternoon are popular, with a pronounced lunch break affect at 12:30pm.

This form of presenting audit data is particularly useful when analysing a large number of rooms.

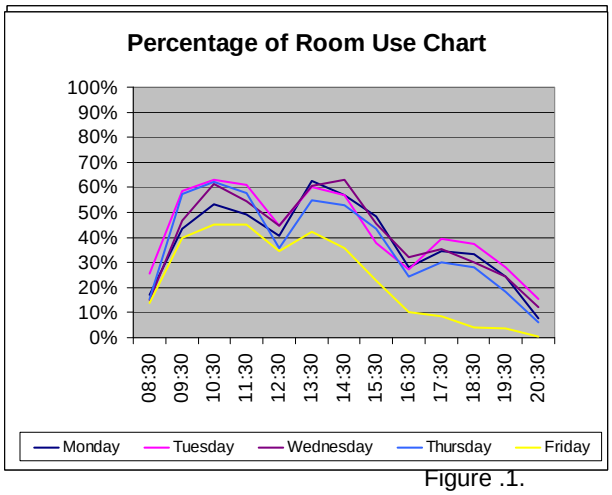


Figure .1.

Capacity Based Analysis

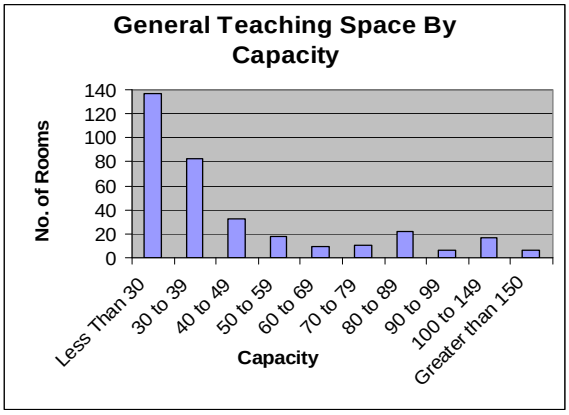


Figure 2

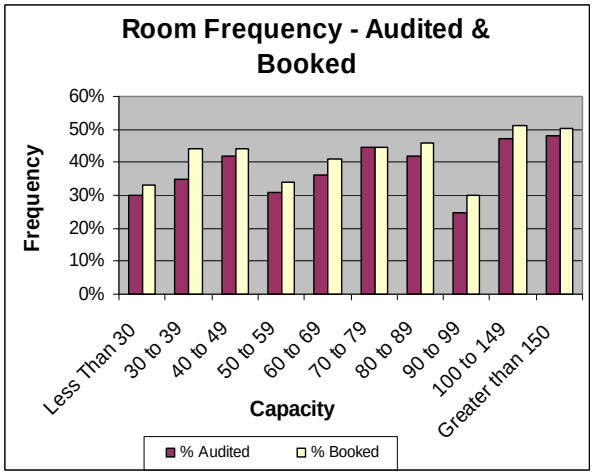


Figure.3

Figures 2 and 3 (above) can be used to determine shortages, or surpluses in the provision of teaching of room use, both physically audited and by spaces.

Figure 2 is an example of a spread of classrooms spaces across an institution, sorted by their capacities.

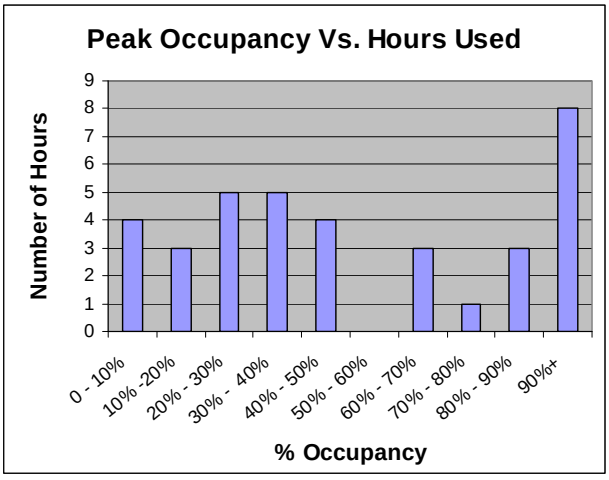
Figure 3 provided an example of the frequency of room use, both physically audited and by Booking, for the teaching space outlined in Figure 2.

In looking at classrooms of a capacity less than 30 in Figure 3, applying a standard of 75% frequency for general teaching spaces, it is clear that these spaces are both under-booked and under-used. As, according to Figure 2, there are approximately 135 of these spaces in the university, further investigation into the reasons for low regularity of use should be undertaken.

Similar analysis using occupancy data can be used in conjunction with this method of Room Audit Data analysis.

Peak occupancy analysis

Figure 4.



An alternative to analysing room use on the basis of room occupancy is to examine the number of hours the space is used at or near full capacity.

The example shown in Figure 4 would equate to an average room occupancy of 50% over the audited period. This is low compared to the recommended standard of 75%. However, Figure 4 indicates that, while the overall occupancy is low, for eight of the hours the room was occupied the room occupancy was above 90%.

Peak Occupancy analysis is another measure that can be useful when determining institution's need for teaching facilities of large capacities.

4.4 Factors Affecting Space Utilisation Rates

A room may be poorly utilised due to its physical attributes: its condition, an oversupply of similar facilities, insufficient capacity, too much capacity, wrong location or changing teaching patterns causing obsolescence.

Aside from the physical nature of the space, other reasons for poor utilisation include:

Flexibility: Students are being offered a wider range of options within courses, and across disciplines. As students enroll in a greater number of subject combinations, the difficulty of timetabling increases, and may lead to decreased utilisation.

Part-Time/ Sessional Staff: Part-time and Sessional staff are not available to deliver programs at all times across the Institution's operating hours. This reduces timetabling freedom and may lead to lower utilisation rates for teaching spaces.

Room Ownership: Granting control of rooms to groups within an institution reduces the accessibility of other groups to those rooms, and thus reduces the flexibility of timetabling.

Timetabling: Unavailability of a particular resource, such as specialised teaching staff or student group themselves, may make optimal use of a physical facility impossible.

Teaching Patterns: Particular teaching patterns that vary by institution may have an impact on overall utilisation. For example, practical placements in programs such as teaching and nursing may result in periods of low utilisation.

Department vs. Institutional Cost: If salary costs are paid from departmental funds, the department may timetable in order to minimise these costs. This may involve hiring Part-time and Sessional teaching staff. A timetable minimising cost to the department may not be the most cost-effective timetable for the institution, as the cost of operating and maintaining the teaching facilities are often not included when determining a timetable.

Specialist Space: Some highly specialised facilities may not achieve high utilisation rates, but may be required in the successful delivery of an academic program. In these instances, utilisation should be looked at in reference to the service provided by the space. This may be particularly pertinent for spaces that may be in use when the room itself is vacant. (E.g. an unattended research project).

5.0 INDICATIVE SPACE MODELLING
FOR PLANNING SPACE REQUIREMENTS BY AOU CODE / SCHOOL / DEPARTMENT / DISCIPLINE

NB: This section is a Guideline for calculating an indicative envelope of space to be allocated to an AOU/ School / Department or Discipline. It is not for allocating space to a position or function. For this scenario use Section 3.0.

SPACE PLANNING IS PREDICATED ON AN ACCURATE SPACE MANAGEMENT / SPACE INVENTORY SYSTEM AND AN ACCURATE INDICATIVE SPACE MODEL.

Indicative Space Model
The Indicative Space Model Grid is shown in Section 5.1. A sample Indicative Space Model calculation is shown in Section 5.2.

HOW TO USE THE INDICATIVE SPACE MODEL GRID AS A SPACE MANAGEMENT TOOL AND AS THE BASIS OF A COMPUTERISED INDICATIVE SPACE MODEL (ISM)

The Grid (Section 5.1) can be used to calculate indicative projected space needs to set up new space, to plan refurbished space or to benchmark against existing space for Academic AOU codes / Schools / Department / Discipline etc.

The Indicative Space Model calculation can be compared with the institution's actual space allocation by AOU code as a "guideline" to ascertain if a School / Department / Discipline may require more or has too much space.

The Space Model Grid can be used as the basis of a computerised Indicative Space Model.

With computer programming assistance it can be linked directly to the institutions student load planning data base. The Grid also works effectively set up in an Excel spreadsheet.

The Model is based on allocating an amount of space per m² UFA by numbers of Staff (FTE) and Student (EFTSL) Types, in a particular School or Department to a Field of Education Group that has been converted into a Space Indicator Group (SIG)

Projected or actual staff and student numbers can be added to the respective Staff and Student Types in the Grid in the line of the appropriate Space Indicator Group (SIG) to calculate and indicative envelope of space that will be required to house this particular AOU / School / Department / Discipline.

Creating a Space Indicator Group (SIG)

The SIG relates to the formula for the amount of space that is allocated to a particular AOU / School / Department / Discipline.

The Field of Education code table (Section 5.3) as downloaded from the DEEWR – Australian Standard Classification of Education (ASCED is used to attach a Field of Education - discipline code to a Space Indicator Code (SIG).

E.g.: The Field of Education - Engineering and Related Technologies - 030000 is SIG E.

HOW THE INDICATIVE SPACE MODEL IS FORMULATED

The Model is based on the parameters of the original DEET Higher Education Indicative Space Model and has been tested over the past seven years.

Note: Add your Institution's standards if it is considered that the m² rates in the ISM Model do not fit your particular institution's need.

The Indicative Space Model takes into consideration the following principles:

- Different disciplines will require different amounts of space, for example, Humanities compared to Sciences.

- Different types of staff will require different amounts of space, for example 'research only' compared to 'teaching only'. *This criterion is defined when the institution reports its staff statistics to DEEWR through the HEPCAT statistics program.*

- Students at different levels will require different amounts of space, for example, a postgraduate student compared to an undergraduate. *This criterion is defined when the institution reports its student statistics to DEEWR through the HEPCAT statistics program.*

Taking the above points into consideration, the amount of space required is not solely reliant on the number of staff and students. An amount of space called an "Ancillary Allowance" is allocated to the total number of staff and students in a particular SIG to calculate the Indicative envelope of space.

The Ancillary space calculation allows for extra space requirements such as store rooms, workshops, dark rooms, cool rooms, server rooms, etc. that are not provided for by the staff and student space calculations.
How the Ancillary space is calculated is explained in the next section.

HOW TO SET UP AND INTERPRET THE SPACE MODEL GRID

The spreadsheet shown in the Grid (5.1) is easier to understand when taking into consideration the following definitions:

Space Indicator Group (SIG)

The SIGs are a code with a formula for the allocation of space by Staff and Student type ie: A, B, C etc.

The SIG's are defined by attaching them to a Field of Education.

The Fields of Education code table (Section 5.3) as downloaded from the Institutions HEPCAT is used to attach a Field of Education / discipline code to a Space Indicator Code (SIG).

The SIG relates to the formula for the amount of space that is allocated to a particular AOU / School / Department / Discipline.

m² per EFT – Staff numbers by Staff Category

Divided into different staff categories:

- Teaching only staff office space
- Research only staff office and lab space
- Teaching and Research staff office
- Teaching and Research Laboratory
- Other Function 1 – Office based admin staff or Professional
- Other Function 2 – Outside based staff such as storeman, gardeners etc.

Note: These are column headings as shown on the grid and have an allocation of space m² UFA attached to them.

Place staff numbers that are entered in the institutional HEPCAT reporting package into the above categories.
For the model insert a column in front of each staff category so that the staff numbers can be added (to calculate the indicative staff space required).

Staff Ancillary Allowance % allocated to a SIG

Each SIG is allocated a different ancillary % that is calculated against the total staff space calculation.

E.g. If a School space requirement comes under SIG A , the Staff Ancillary Allowance is 10% to be added to the total Staff calculation.

Example calc: 10 staff offices in the Teaching and Research Office category of 14m² per EFT calculates to 140m² of space.

The same staff in the T & R category also has space allocated as part of an overall laboratory space. It doesn't mean they each have 16m² of laboratory space. The 16m² each is used to calculate the overall size of the laboratory required to house the department / discipline etc. (later this will be added to the lab space required to house a number of students).

Example calc: 10 staff lab space allocations at 16m² per EFT calculates to 160m² of space
The total Staff space calculation is 300m². Add the 10% Ancillary allowance 30m² to the total staff calculation making total Indicative Staff space 330m².

m² per EFTSL – Student number by Student Category
Divided into different student categories:

- Undergraduate students – EFTSL
- Higher degree by Coursework students – EFTSL (Also includes Grad Certificates and Diplomas)
- Higher degree by Research – EFTSL

Place student numbers that come out of the institutional HEPCAT reporting package into these categories.
For the model, insert a column in front of each student category so that the student numbers can be added (to calculate the indicative student space required).

Student Ancillary Allowance % allocated to a SIG

Each SIG is allocated a different ancillary % that is calculated against the total student space calculation.

E.g. If a School AOU code comes under SIG A , the Student Ancillary Allowance is 60% to be added to the total Student calculation.

100 undergraduate Student EFTSL @ 4m² per EFTSL calculates to 400 m² of space.

Note only use 4m² if undergraduate students are taught in dedicated space. **If students are taught for the majority of time in centrally timetabled teaching space, deduct 2m² per EFTSL to the relevant SIG on the Grid.** (The Timetable or Room Booking system can be used to report on the use of general teaching space per discipline. This will facilitate making the required adjustments).

Example calc: 10 Higher Degree by Research EFTSL @ 10m² calculates to 100m² of space.

The total Student space calculation is 500m². Add the 60% Ancillary allowance 300m² to the total Student calculation making the total Indicative Student space 800m².

Hypothetically, this calculation refers to a Discipline in SIG A that has its own dedicated seminar rooms and laboratories. It is assumed that the institution will be able to provide these dedicated teaching spaces and laboratories including the staff teaching laboratory allowance in this amount of space.

The ISM calculation does not include the space in large lecture theatres or class rooms that are classified as General Timetabled teaching space. That is when modelling on the need for space in a Department or Discipline, timetabled teaching space is not included in their space allocation.

DEFINITION OF HEADINGS USED IN THE INDICATIVE SPACE MODEL

SIG (Space Indicator Groups)

This is the code given to a particular Field of Education / Discipline Group that relates to the formula (Show in the Indicative Space Model Grid 5.1) for the amount of space that is allocated to a particular School / Department / Discipline across are range of staff and students.

Staff Space Types (Teaching only, Research only, Teaching and Research and General)

This relates to the m² allocated per FTE full time staff load. (i.e. fractional staff are combined to create the equivalent full time load within the HEPCAT statistical reporting tool.

General Staff – Other function 1 is for Administration staff within an Academic AOU / School / Department / Discipline.

General Staff – Other function 2 is for staff who do not need desk space or sometimes share a desk space such as storeman drivers, gardeners etc.

Staff Ancillary Allowance

This is calculated on the basis of the total sum of space required for all staff, multiplied by the Ancillary allowance percentage.

This space is to allow for store rooms, workshops (not teaching labs), photocopier rooms, tea rooms etc.

Student Space

This relates to the m² allocated per EFTSL, Effective Full time Student Load (ie: part time students are combined to create the equivalent full time load within the HEPCAT statistical reporting tool.

It should be noted that this method of recording students may create problems for schools trying to teach large cohorts of part-time students where bodies may far exceed theoretical expectations.

Undergraduate = 4m² UFA / EFTSL, or (2m² UFA / EFTSL***** *See note below re use of Timetabled teaching space.)*

Higher Degree or Post-graduate qualifications by Course Work = 5m² UFA / EFTSL depending on whether the SIG is allocated space under the model.

Higher Degree or Post-graduate qualifications by Research = 7 to 10m² UFA / EFTSL depending on the SIG allocated under the model.

Post-graduate qualifications i.e. graduate certificates, graduate diplomas. *Each post-graduate group should be reviewed with their faculty for their needs prior to allocating them to one of the above groups.*

*** NOTE UNDERGRADUATE SPACE:**
Undergraduate space if centrally timetabled space is used.
That is Large Lecture Theatres and Seminar rooms that are not allocated to a Department or Discipline.

SIG C presumes that centrally timetabled space is used for teaching and therefore does not allocate undergraduate teaching space in the Model.

If other SIG groups use centrally timetabled teaching space, a deduction of 2m² UFA/EFTSL may be taken from the total undergraduate student space calculation as they may not need to provide this space in their calculated space entitlement. This will reduce their undergraduate space from 4m² to 2m² per EFTSL.

For some Disciplines that have a large component of their teaching held in centrally controlled computer laboratories, it is recommended the use of SIG C or take a deduction of 2m² UFA/EFTSL from the total undergraduate student space calculation as they do not need to provide this space in their calculated space entitlement. This would reduce their undergraduate space from 4m² to 2m² per EFTSL.

*That is if the departments/ disciplines mostly use centrally timetabled lecture and computing space they may not need to be allocated any undergraduate student space, **however,** this is only a **guide** and consultation with the client on how they teach is recommended. The space manager may still wish to allocate 2m² per undergrad EFTSL when modelling.*

Conversely, when modelling a Department/ Disciplines space needs it is advisable to ensure that the projected undergraduate student cohort can be provided for in available centrally timetabled teaching space. It is recommended that consultation with the Class Timetable manager is undertaken to ensure that the space is available.

Student Ancillary Allowance

This is calculated on the basis of the total sum of space required for all student types, multiplied by the Ancillary allowance percentage.

This space is to allow for store rooms, workshops, photocopier rooms, tea rooms etc.

Note: The Indicative Space Model has been set up on the basis of the original DEETYA/AVCC Space Guidelines 1990 and has been adjusted over time to suit the changing need within Australasian Higher Education sector.

These Guidelines have a commonality with those from the New Zealand Ministry of Education and the New Zealand Vice-Chancellors Committee which allows the Model to be similarly used and adjusted.

Please be aware that Indicative Space Model Grid provided is a Guide and can be adjusted to suit Institution's needs based on their experience and statistical data.

5.1. INDICATIVE SPACE MODEL - GRID

Use this grid to calculate the institution's indicative space requirements. Note: Sample ISM calculation on the next page

Higher Education Space Indicators for Staff m² UFA / FTE **Students m² UFA / EFTSL**

The ISM Grid is a Guideline on how to set up an Indicative Space Model, adjust the m² rate if required to suit your institution

If this Grid doesn't work for your type of institution, change the Model m² sizes based on a real space allocation exercise that has previously worked in your institution,

The total Indicative space calculation is a total of space that can be used to set up a Department/Discipline under this SIG Group and **is not** meant to be the allocation of space for individual staff

Space Indicator Group	Teaching only Staff Office size allocated	Research only Staff Office size allocated	Research only Staff Laboratory space allocated	Teaching & Research Staff Office size allocated	Teaching & Research Staff Lab space allocated	Other Staff General Cat 1 (Also referred to as Professional	Other Staff General Cat 2 (Also referred to as Professional	Staff Ancillary Allowance %	Under graduate Student space allocated per EFTSL *	Higher Degree by Course Work Student space allocated per EFTSL	Higher Degree by Course Research Student space allocated per EFTSL	Student Ancillary Allowance %
	Office	**Office**	**Lab**	**Office**	**Lab**	**Office**	**Space**	**Space**	**Space**	**Space**	**Space**	**Space**
	M²	m²	m²	m²	m²	m²	m²	%	m²	m²	m²	%
A	14	14	16	14	16	12	6	10	4	5	10	60
B	14	14	0	14	0	12	6	10	4	5	7	20
C	14	14	0	14	0	12	6	10	0	0	7	20
D	14	14	0	14	0	12	6	10	4	5	7	40
E	14	14	16	14	16	12	6	10	4	5	10	30
F	14	14	16	14	16	12	6	10	4	5	10	50
G*	14	7	0	14	0	12	6	20	0	5	7	20
H*	14	14	16	14	16	12	6	10	0	5	10	30

*G Office based Research Groups who do not use laboratory space

* H An alternative to SIG E for Computing Type students who mainly undertake their teaching in centrally timetabled computer labs.

* Undergraduate students who use timetabled teaching space – deduct 2m² from undergrad space allowance. If they are mostly taught in centrally timetabled computer labs deduct 2m² Caution do not reduce undergrad space to nil without proper consultation.

5.2. INDICATIVE SPACE MODEL SAMPLE ISM CALCULATION

Projected staff and teaching figures are shown in red and calculations are in bold

Higher Education Space Indicators for Staff m² UFA / FTE

The total Indicative space calculation is a total of space that can be used to set up an AOU Group/ School / Department or discipline under this SIG Group and **is not meant to be the allocation of space for individual staff

Space Indicator Group SIG	Insert projected Teaching Only Staff numbers here	Teaching only Staff Office size allocated	**Total Teach Staff Office Space m²**	Insert projected Research Only Staff numbers here	Research only Staff Office size allocated	**Total Research only Staff Office Space m²**	Insert projected Research only Staff numbers here	Research only Staff Lab space allocated	**Total Research only Staff Lab space m²**	Insert projected Teaching & Research Staff numbers here	Teaching & Research Staff Office size allocated	**Total T & R Staff office space m²**
		Office			**Office**			**Lab**			Office	
E	2	14m²	**28**	5	14m²	**70**	5	16m²	**80**	10	14m²	**140**
Engineering												
Insert projected T & R Staff numbers here	Teaching & Research Staff Lab space allocated	**Total T & R Staff Lab space m²**	Insert projected Other Cat 1 Staff numbers here	Other Staff General Cat 1	**Total Other Staff General Cat 1 office space m²**	Insert Staff numbers here	Other Staff General Cat 2	**Total Other Staff General Cat 2 office space m²**	**TOTAL SPACE CALC FOR STAFF m²**	Staff Ancillary Allowance %	Total Staff space including Ancillary Allowance **m²**	
	Lab			Office			Space					
10	16m²	**160**	4	12m²	**48**	1	6m²	**6**	**532**	10%	**585.2**	

Part 2 – Indicative Space Model -
Higher Education Space Indicators - for Students m² UFA / EFTSL

Insert projected Undergrad Student numbers here	Under-graduate Student space allocated per EFTSL	**Total Under-graduate Student space m²**	Insert projected Higher Degree by Course Work Student numbers here	Higher Degree by Course Work Student space allocated per EFTSL	**Total space Higher Degree by Course Work Student space m²**	Insert projected Higher Degree by Research Student numbers here	Higher Degree by Course Research Student space allocated per EFTSL	**Total Higher Degree by Course Work student space m²**	**TOTAL SPACE CALC FOR STUDENT M²**	Student Ancillary Allow-ance %	Total Student space including Ancillary Allowance **M²**	**TOTAL INDIC-ATIVE SPACE CALC FOR DISC SIG B M²**
120	4m²	**480**	4	5m²	**20**	20	10m²	**200**	**700**	30%	**910**	**1495.2**

The ISM has calculated that (in this example), based on FTE, EFTSL input SIG E Engineering has a total Indicative Space calculation for both staff and students of 1495.2m²

5.3. FIELDS OF EDUCATION NAME AND CODE ATTACHED TO SPACE INDICATOR GROUPS

Codes are taken from the Department of Education, Employment and Workplace Relations (DEEWR) 2009. Australian Standard Classification of Education (ASCED)

This Sheet is to be used in conjunction with the Indicative Space Model Planning calculations to link the Field of Education Code to the Space Indicator Group (SIG)
Note*: The linking has only marginally changed. They are still the same as the original DEETYA SIG Groups as set up in 2001 and have been tested in use over time.*

Code Name	Field of Education	Space Indicator Group SIG
1	**NATURAL AND PHYSICAL SCIENCES**	
010000	Natural and Physical Sciences	F
010100	Mathematical Sciences	E or H
010101	Mathematics	E or H
010103	Statistics	E or H
010199	Mathematical Sciences not elsewhere classified	F
010300	Physics and Astronomy	F
010301	Physics	F
010303	Astronomy	F
010500	Chemical Sciences	F
010501	Organic Chemistry	F
010503	Inorganic Chemistry	F
010599	Chemical Sciences not elsewhere classified	F
010700	Earth Sciences	F
010701	Atmospheric Sciences	F
010703	Geology	F
010705	Geophysics	F
010707	Geochemistry	F
010709	Soil Science	F
010711	Hydrology	F
010713	Oceanography	F
010799	Earth Sciences not elsewhere classified	F
010900	Biological Sciences	A
010901	Biochemistry and Cell Biology	A
010903	Botany	A
010905	Ecology and Evolution	A
010907	Marine Science	A
010909	Genetics	A
010911	Microbiology	A
010913	Human Biology	A
010915	Zoology	A
010999	Biological Sciences not elsewhere classified	A

019900	Other Natural and Physical Sciences	F
019901	Medical Science	A
019903	Forensic Science	A
019905	Food Science and Biotechnology	A
019907	Pharmacology	A
019909	Laboratory Technology	A
019999	Natural and Physical Sciences not elsewhere classified	F
2	**INFORMATION TECHNOLOGY (use H if Timetabled Computer Laboratories are used**	**E or H**
020000	Information Technology	E or H
020100	Computer Science	E or H
020101	Formal Language Theory	E or H
020103	Programming	E or H
020105	Computational Theory	E or H
020107	Compiler Construction	E or H
020109	Algorithms	E or H
020111	Data Structures	E or H
020113	Networks and Communications	E or H
020115	Computer Graphics	E or H
020117	Operating Systems	E or H
020119	Artificial Intelligence	E or H
020199	Computer Science not elsewhere classified	E or H
020300	Information Systems	E or H
020301	Conceptual Modelling	E or H
020303	Database Management	E or H
020305	Systems Analysis and Design	E or H
020307	Decision Support Systems	E or H
020399	Information Systems not elsewhere classified	E or H
029900	Other Information Technology	E or H
029901	Security Science	E or H
029999	Information Technology not elsewhere classified	E or H
3	**ENGINEERING AND RELATED TECHNOLOGIES**	**E**
030000	Engineering and Related Technologies	E
030100	Manufacturing Engineering and Technology	E
030101	Manufacturing Engineering	E
030103	Printing	E
030105	Textile Making	E
030107	Garment Making	E
030109	Footwear Making	E
030111	Wood Machining and Turning	E
030113	Cabinet Making	E
030115	Furniture Upholstery and Renovation	E
030117	Furniture Polishing	E
030199	Manufacturing Engineering and Technology	E
030300	Process and Resources Engineering	E
030301	Chemical Engineering	E

030303	Mining Engineering	E
030305	Materials Engineering	E
030307	Food Processing Technology	E
030399	Process and Resources Engineering not elsewhere classified	E
030500	Automotive Engineering and Technology	E
030501	Automotive Engineering	E
030503	Vehicle Mechanics	E
030505	Automotive Electrics and Electronics	E
030507	Automotive Vehicle Refinishing	E
030509	Automotive Body Construction	E
030511	Panel Beating	E
030513	Upholstery and Vehicle Trimming	E
030515	Automotive Vehicle Operations	E
030599	Automotive Engineering and Technology not elsewhere classified	E
030700	Mechanical and Industrial Engineering and	E
030701	Mechanical Engineering	E
030703	Industrial Engineering	E
030705	Tool making	E
030707	Metal Fitting, Turning and Machining	E
030709	Sheet metal Working	E
030711	Boiler making and Welding	E
030713	Metal Casting and Patternmaking	E
030715	Precision Metalworking	E
030717	Plant and Machine Operations	E
030799	Mechanical and Industrial Engineering and	E
030900	Civil Engineering	E
030901	Construction Engineering	E
030903	Structural Engineering	E
030905	Building Services Engineering	E
030907	Water and Sanitary Engineering	E
030909	Transport Engineering	E
030911	Geotechnical Engineering	E
030913	Ocean Engineering	E
030999	Civil Engineering not elsewhere classified	E
031100	Geomatic Engineering	E
031101	Surveying	E
031103	Mapping Science	E
031199	Geomatic Engineering not elsewhere	E
031300	Electrical and Electronic Engineering	E
031301	Electrical Engineering	E
031303	Electronic Engineering	E
031305	Computer Engineering	E
031307	Communications Technologies	E
031309	Communications Equipment Installation	E
031311	Power line Installation and Maintenance	E
031313	Electrical Fitting, Electrical Mechanics	E

031315	Refrigeration and Air Conditioning	E
031317	Electronic Equipment Servicing	E
031399	Electrical and Electronic Engineering	E
031500	Aerospace Engineering and Technology	E
031501	Aerospace Engineering	E
031503	Aircraft Maintenance Engineering	E
031505	Aircraft Operation	E
031507	Air Traffic Control	E
031599	Aerospace Engineering and Technology not elsewhere classified	E
031700	Maritime Engineering and Technology	E
031701	Maritime Engineering	E
031703	Marine Construction	E
031705	Marine Craft Operation	E
031799	Maritime Engineering and Technology not elsewhere classified	E
039900	Other Engineering and Related	E
039901	Environmental Engineering	E
039903	Biomedical Engineering	E
039905	Fire Technology	E
039907	Rail Operations	E
039909	Cleaning	E
039999	Engineering and Related Technologies not elsewhere classified	E
4	**ARCHITECTURE AND BUILDING**	**D**
040000	Architecture and Building	D
040100	Architecture and Urban Environment	D
040101	Architecture	D
040103	Urban Design and Regional Planning	D
040105	Landscape Architecture	D
040107	Interior and Environmental Design	D
040199	Architecture and Urban Environment not	D
040300	Building	D
040301	Building Science and Technology	D
040303	Building Construction Management	D
040305	Building Surveying	D
040307	Building Construction Economics	D
040309	Bricklaying and Stonemasonry	D
040311	Carpentry and Joinery	D
040313	Ceiling, Wall and Floor Fixing	D
040315	Roof Fixing	D
040317	Plastering	D
040319	Furnishing Installation	D
040321	Floor Coverings	D
040323	Glazing	D
040325	Painting, Decorating and Sign Writing	D
040327	Plumbing	D
040329	Scaffolding and Rigging	D
040399	Building not elsewhere classified	D

5	**AGRICULTURE, ENVIRONMENTAL & RELATED STUDIES**	**A**
050000	Agriculture, Environmental and Related Studies	A
050100	Agriculture	A
050101	Agricultural Science	A
050103	Wool Science	A
050105	Animal Husbandry	A
050199	Agriculture not elsewhere classified	A
050300	Horticulture and Viticulture	A
050301	Horticulture	A
050303	Viticulture	A
050500	Forestry Studies	A
050501	Forestry Studies	A
050700	Fisheries Studies	A
050701	Aquaculture	A
050799	Fisheries Studies not elsewhere classified	A
050900	Environmental Studies	A
050901	Land, Parks and Wildlife Management	A
050999	Environmental Studies not elsewhere classified	A
059900	Other Agriculture, Environmental	A
059901	Pest and Weed Control	A
059999	Agriculture, Environmental and Related Studies	A
6	**HEALTH**	**A**
060000	Health	A
060100	Medical Studies	A
060101	General Medicine	A
060103	Surgery	A
060105	Psychiatry	A
060107	Obstetrics and Gynaecology	A
060109	Paediatrics	A
060111	Anaesthesiology	A
060113	Pathology	A
060115	Radiology	A
060117	Internal Medicine	A
060119	General Practice	A
060199	Medical Studies not elsewhere classified	A
060300	Nursing	A
060301	General Nursing	A
060303	Midwifery	A
060305	Mental Health Nursing	A
060307	Community Nursing	A
060309	Critical Care Nursing	A
060311	Aged Care Nursing	A
060313	Palliative Care Nursing	A
060315	Mothercraft Nursing and Family and Child	A
060399	Nursing not elsewhere classified	A
060500	Pharmacy	A

060501	Pharmacy	A
060700	Dental Studies	A
060701	Dentistry	A
060703	Dental Assisting	A
060705	Dental Technology	A
060799	Dental Studies not elsewhere classified	A
060900	Optical Science	A
060901	Optometry	A
060903	Optical Technology	A
060999	Optical Science not elsewhere classified	A
061100	Veterinary Studies	A
061101	Veterinary Science	A
061103	Veterinary Assisting	A
061199	Veterinary Studies not elsewhere classified	A
061300	Public Health	A
061301	Occupational Health and Safety	A
061303	Environmental Health	A
061305	Indigenous Health	A
061307	Health Promotion	A
061309	Community Health	A
061311	Epidemiology	A
061399	Public Health not elsewhere classified	A
061500	Radiography	A
061501	Radiography	A
061700	Rehabilitation Therapies	A
061701	Physiotherapy	A
061703	Occupational Therapy	A
061705	Chiropractic and Osteopathy	A
061707	Speech Pathology	A
061709	Audiology	A
061711	Massage Therapy	A
061713	Podiatry	A
061799	Rehabilitation Therapies not elsewhere classified	A
061900	Complementary Therapies	A
061901	Naturopathy	A
061903	Acupuncture	A
061905	Traditional Chinese Medicine	A
061999	Complementary Therapies not elsewhere classified	A
069900	Other Health	A
069901	Nutrition and Dietetics	A
069903	Human Movement	A
069905	Paramedical Studies	A
069907	First Aid	A
069999	Health not elsewhere classified	A

7	**EDUCATION (Presumes the use of timetabled teaching space)**	**C**
070000	Education	C
070100	Teacher Education	C
070101	Teacher Education: Early Childhood	C
070103	Teacher Education: Primary	C
070105	Teacher Education: Secondary	C
070107	Teacher-Librarianship	C
070109	Teacher Education: Vocational Education	C
070111	Teacher Education: Higher Education	C
070113	Teacher Education: Special Education	C
070115	English as a Second Language Teaching	C
070117	Nursing Education Teacher Training	C
070199	Teacher Education not elsewhere classified	C
070300	Curriculum and Education Studies	C
070301	Curriculum Studies	C
070303	Education Studies	C
079900	Other Education	C
079999	Education not elsewhere classified	C
08	**MANAGEMENT AND COMMERCE (Presumes TT space)**	**C**
080000	Management and Commerce	C
080100	Accounting	C
080101	Accounting	C
080300	Business and Management	C
080301	Business Management	C
080303	Human Resource Management	C
080305	Personal Management Training	C
080307	Organisation Management	C
080309	Industrial Relations	C
080311	International Business	C
080313	Public and Health Care Administration	C
080315	Project Management	C
080317	Quality Management	C
080319	Hospitality Management	C
080321	Farm Management and Agribusiness	C
080323	Tourism Management	C
080399	Business and Management not elsewhere classified	C
080500	Sales and Marketing	C
080501	Sales	C
080503	Real Estate	C
080505	Marketing	C
080507	Advertising	C
080509	Public Relations	C
080599	Sales and Marketing not elsewhere classified	C
080700	Tourism	C
080701	Tourism	C
080900	Office Studies	C

080901	Secretarial and Clerical Studies	C
080903	Keyboard Skills	C
080905	Practical Computing Skills	C
080999	Office Studies not elsewhere classified	C
081100	Banking, Finance and Related Fields	C
081101	Banking and Finance	C
081103	Insurance and Actuarial Studies	C
081105	Investment and Securities	C
081199	Banking, Finance and Related Fields not elsewhere classified	C
089900	Other Management and Commerce	C
089901	Purchasing, Warehousing and Distribution	C
089903	Valuation	C
089999	Management and Commerce not elsewhere classified	C
9	**SOCIETY AND CULTURE**	**C**
090000	Society and Culture	C
090100	Political Science and Policy Studies	C
090101	Political Science	C
090103	Policy Studies	C
090300	Studies in Human Society	C
090301	Sociology	C
090303	Anthropology	C
090305	History	C
090307	Archaeology	C
090309	Human Geography	C
090311	Indigenous Studies	C
090313	Gender Specific Studies	C
090399	Studies in Human Society not elsewhere classified	C
090500	Human Welfare Studies and Services	C
090501	Social Work	C
090503	Children's Services	C
090505	Youth Work	C
090507	Care for the Aged	C
090509	Care for the Disabled	C
090511	Residential Client Care	C
090513	Counselling	C
090515	Welfare Studies	C
090599	Human Welfare Studies and Services not elsewhere classified	C
090700	Behavioral Science If labs are required	A
090701	Psychology If labs are required	A
090799	Behavioral Science not elsewhere If labs are required	A
090900	Law (If specialist Court rooms are required)	B
090901	Business and Commercial Law	B
090903	Constitutional Law	B
090905	Criminal Law	B
090907	Family Law	B
090909	International Law	B

090911	Taxation Law	B
090913	Legal Practice	B
090999	Law not elsewhere classified	B
091100	Justice and Law Enforcement	B
091101	Justice Administration	B
091103	Legal Studies	B
091105	Police Studies	B
091199	Justice and Law Enforcement not elsewhere classified	B
091300	Librarianship, Information Management	C
091301	Librarianship and Information Management	C
091303	Curatorial Studies	C
091500	Language and Literature	C
091501	English Language	C
091503	Northern European Languages	C
091505	Southern European Languages	C
091507	Eastern European Languages	C
091509	Southwest Asian and North African Languages	C
091511	Southern Asian Languages	C
091513	Southeast Asian Languages	C
091515	Eastern Asian Languages	C
091517 `	Australian Indigenous Languages	C
091519	Translating and Interpreting	C
091521	Linguistics	C
091523	Literature	C
091599	Language and Literature not elsewhere classified	C
091700	Philosophy and Religious Studies	C
091701	Philosophy	C
091703	Religious Studies	C
091900	Economics and Econometrics	C
091901	Economics	C
091903	Econometrics	C
092100	Sport and Recreation - Assumes labs not required	C
092101	Sport and Recreation Activities	C
092103	Sports Coaching, Officiating and Instruction	C
092199	Sport and Recreation not elsewhere classified	C
099900	Other Society and Culture	C
099901	Family and Consumer Studies	C
099903	Criminology - Assumes labs not required	C
099905	Security Services	C
099999	Society and Culture not elsewhere classified	C
10	**CREATIVE ARTS**	**D**
100000	Creative Arts	D
100100	Performing Arts	D
100101	Music	D
100103	Drama and Theatre Studies	D

100105	Dance	D
100199	Performing Arts not elsewhere classified	D
100300	Visual Arts and Crafts	D
100301	Fine Arts	D
100303	Photography	D
100305	Crafts	D
100307	Jewellery Making	D
100309	Floristry	D
100399	Visual Arts and Crafts not elsewhere classified	D
100500	Graphic and Design Studies	D
100501	Graphic Arts and Design Studies	D
100503	Textile Design	D
100505	Fashion Design	D
100599	Graphic and Design Studies not elsewhere classified	D
100700	Communication and Media Studies (Use E if labs required)	C or E
100701	Audio Visual Studies (Use E if labs required)	C or E
100703	Journalism	C
100705	Written Communication	C
100707	Verbal Communication	C
100799	Communication and Media Studies not elsewhere classified	C
109900	Other Creative Arts	C or D
109999	Creative Arts not elsewhere classified	C or D
11	**FOOD, HOSPITALITY AND PERSONAL SERVICES**	**E**
110000	Food, Hospitality and Personal Services	E
110100	Food and Hospitality	E
110101	Hospitality	E
110103	Food and Beverage Service	E
110105	Butchery	E
110107	Baking and Pastry Making	E
110109	Cookery	E
110111	Food Hygiene	E
110199	Food and Hospitality not elsewhere classified	E
110300	Personal Services	C
110301	Beauty Therapy	E
110303	Hairdressing	E
110399	Personal Services not elsewhere classified	C or E
12	**MIXED FIELD PROGRAMMES -** Assumes labs not required	**C**
120000	Mixed Field Programmes	C
120100	General Education Programmes	C
120101	General Primary and Secondary Education	C
120103	Literacy and Numeracy Programmes	C
120105	Learning Skills Programmes	C
120199	General Education Programmes not elsewhere classified	C
120300	Social Skills Programmes	C
120301	Social and Interpersonal Skills Programmes	C
120303	Survival Skills Programmes	C

120305	Parental Education Programmes	C
120399	Social Skills Programmes not elsewhere classified	C
120500	Employment Skills Programmes	C
120501	Career Development Programmes	C
120503	Job Search Skills Programmes	C
120505	Work Practices Programmes	C
120599	Employment Skills Programmes not elsewhere classified	C
129900	Other Mixed Field Programmes	C
129999	Mixed Field Programmes not elsewhere classified	C

6.0 INSTITUTIONS WHO CONTRIBUTED TO THE REVISION OF THE TEFMA SPACE PLANNING GUIDELINES BY PROVING FEEDBACK AND STATISTICS.

Note: Institutions who also provided stats for Section 2 are noted with **

University or Higher Education Institution	Space Management System	Timetabling System	Institutional Contact	Email
The University of Adelaide **	Spatial Asset Management	Syllabus Plus	Kendra Backstrom Snr Project Officer Andrew Trotter Manager Facilities Records	kendra.backstrom@adelaide.edu.au andrew.trotter@adelaide.edu.au
The University of Auckland **	Insite	Schedule 25 planning to move to Syllabus Plus	Terry Young Planning Manager	tyoung@auckland.ac.nz
The Australian National University **	In house Space data base worked in comb with Maximo and AutoCad	Syllabus Plus	Bart Meehan Asst Director Facilities and Services	Bart.meehan@anu.edu.au
AUT University of New Zealand **	ARION	CMIS	Corrie Cook Manager Space Planning and Timetabling	Corrie.cook@aut.ac.nz
University of Ballarat **	Aperture	Syllabus Plus	Jim Burrough Dir Physical Resources	j.burrough@ballarat.edu.au
University of Central Queensland	Aperture	Celcat	Maurice Gall Space Manager	m.gall@cqu.edu.au
Central TAFE Western Australia	FM Interact	Unified Enrolments	Geoff Blomkamp Snr Consultant Space Utilisation	Geoff.blomkamp@central.wa.edu.au
Charles Sturt University	XL Spreadsheet	Banner, reviewing S Plus	Iona Beauly Project Officer	ibeauly@csu.edu.au
Curtin University of Technology	Archibus	Syllabus Plus	Stuart Wilkie Exec Officer, Properties	s.wilkie@curtin.edu.au

Edith Cowan University	Archibus	CMIS	Jenny Schumann Manager, Accommodation Planning	j.schumann@ecu.edu.au
Griffith University	Archibus FM	Syllabus Plus	Vicki Repcsik, Space Analyst	v.repcsik@griffith.edu.au
James Cook University	FM Systems	Celcat	Terry Richards Coordinator, Space Planning and Timetabling	Terry.richards@jcu.edu.au
Massey University NZ	In House system	Not provided	University Property Manager	t.anderson@massey.ac.nz
University of Melbourne	Archibus	Syllabus Plus	Michael Tracey General Manager Planning & Infrastructure	mtracey@unimelb.edu.au
Monash University	Archibus	Syllabus Plus	Michael Scott Manager, Space Management Unit	Michael.scott@adm.monash.edu.au
University of Newcastle	Maximo	Syllabus Plus	Tony Guihot Assoc Director Asset and Property	Tony.guihot@newcastle.edu.au
University of New England	Archibus FM 16	Syllabus Plus	Cameron Marshall Space Management and CAD Services Officer	Cmarsha5@une.edu.au
University of New South Wales	In house system which is informed by the TEFMA SP Guidelines	Syllabus Plus	Ed Smith Manager, Planning and Property	e.smith@unsw.edu.au
University of Otago	In House	In House	Ross Cameron Property Manager	Ross.cameron@otago.ac.nz
University of Queensland	In House SQL Based System	AD Astra	Vivienne Binns, Space Analyst	v.binns@pf.uq.edu.au
Queensland University of Technology **	Archibus	Syllabus Plus	Barbara Robinson Manager, Standards and Records	b.robinson@qut.edu.au

RMIT Melbourne	Archibus	Syllabus Plus	Garry Bradley Ass Dir, Space Planning & Management	Garry.bradley@rmit.edu.au
University of South Australia	Aperture	Syllabus Plus for TT and RUIS for analysing utilisation	Sarah Lynds Snr Project Manager	Sarah.lynds@unisa.edu.au
University of Southern Queensland **	Archibus	Celcat	Simon Pearl Manager, Planning and Space	pearl@usq.edu.au
University of the Sunshine Coast	Spreadsheet	XL spread-sheet. Currently implementing a new system	Richard Maguire Operations Manager	rmaguire@usc.edu.au
Swinburne University	Aperture	Syllabus Plus	Andrew Smith Director Facilities and Services	asmith@swin.edu.au
University of Tasmania **	Archibus	In House looking at S Plus	Joan Rodrigues Manager, Capital Planning	Joan.Rodrigues@utas.edu.au
Unitec - NZ	Aperture soon to be updated with Autodesk FM	Syllabus Plus	Glen Huggard Director, Facilities Management	ghuggard@unitec.ac.nz
Victoria University - Australia	Aperture for Space records. AutoCad for drawing, Space MAP for reporting	Syllabus Plus	Terry Roche Manager, Space Management	Terry.roche@vu.edu.au
Victoria University of Wellington NZ **	MS Data base	Faculty CMIS	Charlotte Philips, Space Planner	Charlotte.philips@vuw.ac.nz
University of Waikato	Database of rooms – in house	Syllabus Plus	Katie Laurence, Property Assistant	katiel@waikato.ac.nz
Wellington Institute of Technology NZ	Nil	Syllabus Plus	Alex Cabrera, Facilities and Operations Manager	Alex.cabrera@weltec.ac.nz
University of Western Australia **	Archibus	Syllabus Plus	Jillian Loney, Accommodation / Planning & Utilisation	Jillian.loney@uwa.edu.au
University of Wollongong	Archibus and home grown spreadsheets	Syllabus Plus	Tom Hunt, Manager Space	thunt@uow.edu.au

7.0 GLOSSARY OF TERMS & ABBREVIATIONS

AAPPA	Australasian Association of Higher Education Facilities Officers (now TEFMA)
ASCED	Australian Standard Classification of Education
AOU	Academic Organisational Unit
DEETYA	Department of Education, Employment, Training and Youth Affairs (now DEEWR)
DEEWR	Department of Education, Employment, and Workplace Relations. DEEWR collects a range of statistics from Higher Education providers particularly information about staff, students and applicants. http://www,heimshelp.deewr.gov.au/
DEST	Department of Education, Science and Training (now DEEWR)
DESTPAC	Statistical Information Package from DEST (now HEPCAT)
EFTSL	Equivalent Full-time Student Load
EFTSU	Equivalent Full-time Student Unit (now EFTSL)
FTE	Full-time Equivalent Staff
FTF	Full-time Fractional Staff
GFA	Gross Floor Area
HEIMS	Higher Education Information Management System
HEPCAT	Higher Education Client Assistance Tool
IOU	Institution Organisation Unit (now AOU)
RF	Room Frequency

RFF	Room Frequency Factor
SOF	Seat Occupancy Factor
STATPAC	Statistical Information Package (now HEPCAT)
TBA	To Be Advised
TU	Theoretical Utilisation
UFA	Useable Floor Area
UTIL	Utilisation

8.0 ACKNOWLEDGEMENTS

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The TEFMA Board also acknowledges the major contributions made by the completion of surveys and feedback provided by 34 Higher Education Institutions who are listed in Section 6 of the Space Planning Guidelines.

September, 2009

9.0 FURTHER READING

Hans Milton, Editor (1994) ‘Glossary of Building Terms’ - Fourth Edition, Standards Australia HB50 -1994 (Standards Australia, National Committee on Rationalised Building, Suppliers Index joint publication)

Persis Rickes (Ed.) (2002). ‘Special Planning for Special Spaces’ (SCUP Society for College and University Planning)

Donald M. Norris and Nick L Poulton (1991) 'A Guide for New Planners.' (SCUP Society for College and University Planning)

Beverley L. Kirkpatrick and James M. Kirkpatrick (2001) 'AutoCAD for Interior Design and Space Planning using AutoCAD 2002.' (Pearson Education)

LAMA BES Facilities Committee, Library Administration and Management Association 'Building Blocks for Planning Functional Library Space' (2001). (Scarecrow Press).

SCONUL Advisory Committee on Buildings. 'Space requirements for academic libraries and learning resource centres.' (London, SCONUL, 1996).

Wes McGregor (2000) 'Facilities Planning and the Business of Space.' (Butterworth - Heinemann).

Bareither, Harlan and Scillinger, Jerry (1968) 'University Space Planning' University of Illinois Press, Chicago, USA.

The web sites of the following organisations have publications on space planning:

- Council of Ontario Universities' (COU) Standing Committee on Space Standards and Reporting
- APPA: The Association of Higher Education Facilities Officers, www.appa.org
- Western Interstate Commission for Higher Education: WICHE
- SCUP: Society for College and University Planning, www.scup.org
- LAMA BES: Library Administration and Management Association, Building and Equipment Section.
- DEST, Education Services for Overseas Students (ESOS) www.detya.gov.au/esos/ specifies educational resources and facilities required for CRISCOS registered courses.
- National Center for Educational Statistics (NCES) USA, Working Group on Postsecondary Physical Facilities, Postsecondary Education Facilities Inventory and Classification Manual, http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=92165
- The Higher Education Estates Web Site, UK www.heestates.ac.uk