

UNIVERSITY GRANTS COMMITTEE OF HONG KONG

**REVIEW OF SPACE REQUIREMENTS
FORMULAE AND STANDARDS**

FINAL REPORT

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EXECUTIVE SUMMARY

BACKGROUND

The University Grants Committee (UGC) commissioned Harvey H. Kaiser Associates in December 2004 to undertake a review on the formulae and standards currently used to arrive at the space and accommodation needs of the eight publicly-funded tertiary institutions under its aegis, and make recommendations on any necessary changes.

The objectives of the study are to:

- (a) review the appropriateness and applicability of the existing formulae and standards, and arrive at the space requirements of UGC-funded institutions by taking into account recent local developments in the higher education sector, as well as international planning standards;
- (b) study and address the views/concerns raised by the institutions regarding the existing norms;
- (c) propose and recommend necessary changes to the formulae and standards being used, with which to assess, at a macroscopic level, the adequacy of the UGC-funded institutions' current and approved planned space and accommodation. In carrying out the assessment, the consultants should also be politically astute and will need to take into account the practical needs and views of the institutions so that the end result is acceptable to them; and
- (d) advise on the extent (in terms of net square metres or in percentage terms) by carrying out an assessment using the updated formulae and standards to which each institution is currently over- or under-provided with space and accommodation for its present and future levels of activity.

The review formally commenced in January 2005 and the UGC set up the Task Force on Space and Accommodation to oversee the consultancy study. In the process of the review, the consultants met with representatives of the institutions, considered the institutions' written submissions, performed a study on the space utilization situation at the institutions, studied experience in other overseas jurisdictions, and considered issues such as "3+3+4", whole person development, internationalization, etc.

Space provision is of course not an end in itself. The ultimate objective of providing space for higher education institutions is to enable effective educational activities to take place at a reasonable cost to society. Through the provision of adequate amounts of space of the appropriate types, we can help facilitate teaching and learning in the institutions. It follows that space provision must be aligned with the needs of the institutions and the students. Although this study is primarily about space standards and formulae, the consultants have kept the higher purpose in mind throughout the study.

CONSULTANCY FINDINGS

- The room use methodology is still applicable and is generally accepted by the institutions. There is no need to make fundamental changes.
- After considering institutions' views, the results of the space utilization study, and international experience, the consultants have concluded that there are no convincing justifications significantly to increase the current space norms. The existing standards are largely appropriate.
- However, some variables in the formulae do need to be updated and changed to reflect institutions' concerns, technological and pedagogical developments, the results of the space utilization study, and to ensure that the standards tally with the latest international developments.
- The formulae and standards will be improved and enhanced. A new study space category has been recommended, and the open laboratories formula will be revamped. The cognate groupings in the teaching laboratories and research laboratories categories have been updated. The consultants have also made recommendations to amend the formulae of the office, library, and indoor sports categories.
- The weekly room hours of the classrooms and teaching laboratories and the seat occupancy ratio of the teaching laboratories category should be changed to reflect international trends and institutions' enhanced efficiency in utilizing these facilities.

OTHER OBSERVATIONS

- During the course of the study, the space inventories of the institutions have been updated. There is a space "shortfall" situation in the UGC sector, i.e. the space required by institutions based on the existing space standards exceeds the actual space available (including capital projects under construction). The total size of the shortfall of the seven UGC-funded institutions (excluding HKIEd, which has a surplus and because the surplus cannot be used to offset other institutions' shortfall) is about 91,000 NASM (as at April 2006). All institutions, except HKIEd, have different degrees of "shortfall", and the situation is particularly significant in

space categories that the institutions have expressed concern about – libraries, research laboratories, and teaching laboratories.

- It is believed that the root cause of why some institutions currently feel congested is the current space shortfall. The true solution is therefore seeking capital projects to make up the “shortfall”, an area that the UGC will continue vigorously to support institutions. Indeed it is noted that a number of capital projects are being planned/under construction in different institutions to address this situation. The “congestion” situation will be relieved when these projects are completed.
- The consultants note that there is a significant shortfall in the library space category. While some institutions are planning capital programmes to make up part of the shortfall, it is also noted that institutions are working collaboratively on a joint storage facility proposal with a view efficiently to use public resources and valuable campus space.

CONCLUSIONS AND RECOMMENDATIONS

Having consulted the institutions, considered the results of the space utilization study, and studied experience from other jurisdictions in the United States, Canada, and Australia, the consultants have proposed some adjustments to the formulae. But the net effect of these changes together will be marginal.

The recommended changes to the formulae and standards are as follows:

- Add a new “study space” category to reflect the change in pedagogy, emphasize informal teaching and take into account the congested local living environment, the lack of study space in Hong Kong and the number of hostels. This category reflects study space outside libraries.
- Revamp the open laboratories formula to make it implementable. The existing formula cannot be implemented because of data availability.
- Increase slightly indoor sports space provision to cater for the increasing emphasis on whole person development.
- Update the cognate groupings for teaching laboratories (18 groupings updated) and research laboratories (15 groupings updated), to reflect changing technologies and the latest international practices.
- Update the office space formula to reflect the latest changes in government office space provision and provide office space for non-reported staff, e.g. visiting scholars, temporary staff *etc.* Several institutions suggest this.
- Update the library formula to reflect technological development and changes in the usage pattern. Electronic study stations will be accounted for.
- Increase the weekly room hours of the classroom category from 30 to 32 to reflect the results of the space utilization study and international experience.
- Increase the seat occupancy ratio of the teaching laboratories category from 70 to 75% (for all categories). Also increase the weekly room hours of this formula from 20 to 24 (for categories A and B of teaching laboratories only). These changes reflect the results of the space utilization survey and the latest international experience.
- Slightly change the credit hour proxy in the classroom and teaching laboratories categories to reflect changing pedagogy.

A detailed table showing the differences between the existing and the recommended standards is at **Figure E-1** for reference.

IMPLICATIONS

If the recommended changes to the existing formulae are accepted, all the institutions, except HKIEd, will register a very slight increase in their space requirement for 2007/08, ranging from an increase of about 250 net assignable square metres (NASM) to over 2,500 NASM. For HKIEd’s case, there will be a very slight decrease of about 260 NASM. But sector-wide, the requirement level stays basically unchanged.

Hong Kong University Grants Committee
Review of Space Requirement Formulae and Standards

Space required under the existing and recommended standards for 2007/08 is as follows:

Institution	Enrolment (fte)	Existing total space required according to existing formula (NASM)	Recommended total space required according to latest recommendation (NASM)	Difference
CityU	8,988	113,265	113,514	249
HKBU	4,781	65,764	68,231	2,467
LU	2,263	24,235	24,708	473
CUHK	11,712	189,872	191,713	1,841
HKIEd	3,785	47,232	46,976	- 256
PolyU	11,778	173,051	173,389	338
HKUST	6,572	113,216	114,589	1,373
HKU	11,222	190,304	192,548	2,244
Total	61,101	916,940	925,668	8,728

Space required under the existing and recommended standards for 2012/13 is as follows*:

Institution	Existing total space required according to existing formula (NASM)	Recommended total space required according to latest recommendation (NASM)	Difference
All Institutions	1,034,744	1,044,484	9,740

* The 2012/13 scenario is estimated based on the best available information at the time of the study. Some assumptions have been made in the process, and these are detailed in the report. Readers are cautioned that the scenario is performed only to test the appropriateness of the recommendations. There is no intention to commit the UGC to any future decisions on “3+3+4”, including capital projects, and the results do not represent absolute certainties.

The final recommendations incorporate most if not all of the institution’s concerns. The desire to avoid micromanagement of unique institutional requirements is expressed by declining to make institution-specific adjustments to formula and standards. Major concerns of the UGC and institutions are addressed both explicitly and implicitly in the recommended revisions. For example, role differentiation is implicit in the proxy of student credit hours for classrooms and teaching laboratories, in the use of cognate category groupings for teaching and research laboratories, and physical bound volume equivalents for libraries. The new study space category, revamped open laboratories formula, and updated standards for office and indoor sports facilities respond to concerns for “3+3+4”, whole person development, and internationalization.

The consultant recommends referral to the UGC annual capital works programme cycle for a response to those requirements that cannot be included in the formula and standards. Recognition of a genuine space shortfall justifies capital projects to make up this shortfall.

Hong Kong University Grants Committee
Review of Space Requirement Formulae and Standards

Figure E-1 Space Planning Standards-Existing and Recommended Revisions

Category	Space standards	Existing Model	Recommended Model
A Classroom	Space factor	0.078 NASM/hours/week	0.073 NASM/hours/week
	-Student station size (SSS)	1.4 NASM	1.4 NASM
	-Weekly room hours (WRH)	30 hours/week	32 hours/week
	-Seat Occupancy rate (SOR)	60%	60%
	Proxy of credit hours		
	-SD	16 hours/fte student	17 hours/fte student
	-Ug	16 hours/fte student	17 hours/fte student
	-TPg	12 hours/fte student	17 hours/fte student
-RPg	12 hours/fte student	9 hours/fte student	
B Study space	Space factor	-	0.15 NASM/fte student
C Teaching laboratories	Space factor		
	-Category A	0.20 NASM/WSLabCH	0.16 NASM/WSLabCH
	-Category B	0.35 NASM/WSLabCH	0.27 NASM/WSLabCH
	-Category C	0.50 NASM/WSLabCH	0.47 NASM/WSLabCH
	-Category D	0.65 NASM/WSLabCH	0.61NASM/WSLabCH
	Student station size (SSS)		
	-Category A	2.8 NASM	2.8 NASM
	-Category B	4.9 NASM	4.9 NASM
	-Category C	7.0 NASM	7.0 NASM
	-Category D	9.1 NASM	9.1 NASM
	Weekly room hours (WRH)		
	-Category A	20 hours/week	24 hours/week
	-Category B	20 hours/week	24 hours/week
	-Category C	20 hours/week	20 hours/week
	-Category D	20 hours/week	20 hours/week
Seat Occupancy rate (SOR)	70%	75%	
Weekly student lab clock hours (WSLabCH)	See Figure 1	See Figure 1	
Discipline groupings	See Figure 2	See Figure 2	
D Open laboratories	Space factor		
	-Category A & B	-	0.04 NASM/fte student
	-Category C & D	-	0.08 NASM/fte student
E Research laboratories	Research expenditure per \$10 million		
	-Category A	100 NASM/\$10m	100 NASM/\$10m
	-Category B	300 NASM/\$10m	300 NASM/\$10m
	-Category C	500 NASM/\$10m	500 NASM/\$10m
	-Category D	650 NASM/\$10m	650 NASM/\$10m
	-Category E	800 NASM/\$10m	800 NASM/\$10m
	Discipline groupings	See Figure 3	See Figure 3
F Office	Space factor		
	-Category 1	22 NASM/fte staff	18 NASM/fte staff
	-Category 2	18 NASM/fte staff	16 NASM/fte staff
	-Category 3	15 NASM/fte staff	14 NASM/fte staff
	-Category 4	10 NASM/fte staff	10 NASM/fte staff
	-Category 5	3.5 NASM/fte staff	4 NASM/fte staff
	Space for non-reporting staff	-	2.5% of aggregate amount of space of the five staff grade categories
G Library	Space factor		
	(1) Student fte %	20%	20%
	(2) Staff fte %	8%	2%
	(3) Regular station size	2.3 NASM/fte	2.3 NASM/fte
	(4) Electronic station size	-	3.2 NASM/fte
	(5) Regular station size %	100%	90%
	(6) Electronic station size %	0%	10%

Hong Kong University Grants Committee
Review of Space Requirement Formulae and Standards

Category	Space standards	Existing Model	Recommended Model
G Library	A Calculation of study space	Total study space= [student fte x (1) + staff fte x (2)] x (3)	(a) Regular study space = [student fte x (1) + staff fte x (2)] x (3) x (5) (b) Electronic study space = [student fte x (1) + staff fte x (2)] x (4) x (6) Total study space = (a) + (b)
	B Stack space per volume		
	-First 150,000 volumes	0.0093 NASM/volume	0.0093 NASM/volume
	-Next 150,000 volumes	0.0084 NASM/volume	0.0084 NASM/volume
	-Next 300,000 volumes	0.0074 NASM/volume	0.0074 NASM/volume
	-Over 600,000 volumes	0.0065 NASM/volume	0.0065 NASM/volume
	C Service space	15% of aggregate amount of study and stack space	15% of aggregate amount of study and stack space
H Indoor sports facilities	Space factor		
	-First 3,000 fte students	0.7 NASM/fte student	0.8 NASM/fte student
	-Next 3,000 fte students	0.5 NASM/fte student	0.5 NASM/fte student
	-Over 6,000 fte students	0.1 NASM/fte student	0.1 NASM/fte student
	Minimum provision	2100 NASM	2400 NASM
I Student and staff amenities	Space factor		
	-First 3,000 fte students	1.5 NASM/fte student	1.5 NASM/fte student
	-Over 3,000 fte students	1.2 NASM/fte student	1.2 NASM/fte student
	Minimum provision	4500 NASM	4500 NASM
J Support space	Calculation of support space	4% of aggregate amount of all space categories less support category	4% of aggregate amount of all space categories less support category

Hong Kong University Grants Committee
Review of Space Requirement Formulae and Standards

Figure 1. Teaching Laboratories Weekly Student Lab Clock Hours (WSLabCH) by DCC

DCC	Discipline	NASM	SD/Ug	TPg	RPg
Category A					
32	math. & statistics	2.80	3.84	1.00	1.00
33	computer studies/science	2.80	15.84	12.00	12.00
34	law	2.80	2.52	1.00	0.00
35	accountancy	2.80	7.70	0.00	0.00
36	public administration	2.80	0.00	0.00	0.00
37	business studies	2.80	7.70	0.00	0.00
40	economics	2.80	1.00	0.00	0.00
42	social work	2.80	6.30	6.30	0.00
43	other social studies	2.80	0.00	0.00	0.00
44	Chinese lang. & lit.	2.80	2.52	2.82	2.82
45	English lang. & lit.	2.80	2.52	2.82	2.82
46	Japanese lang. & lit.	2.80	2.52	2.82	2.82
47	other languages	2.80	2.52	2.82	2.82
48	translation	2.80	2.52	2.82	2.82
50	history	2.80	0.00	0.00	0.00
51	other arts/humanities	2.80	0.00	0.00	0.00
57	education	2.80	11.95	6.26	3.60
61	sociology	2.80	1.00	0.00	0.00
Category B					
8	psychology	4.90	9.37	13.39	1.66
41	geography	4.90	10.00	8.87	8.87
58	physical education	4.90	10.00	10.00	10.00
59	home economics	4.90	19.20	19.20	19.20
99	continuing education	4.90	11.25	5.31	0.00
Category C					
1	clinical medicine	7.00	7.10	4.66	4.66
2	clinical dentistry	7.00	8.16	2.54	1.60
4	nursing	7.00	13.70	0.00	0.00
5	other health care prof.	7.00	25.50	0.00	0.00
6	biological sciences	7.00	9.50	10.24	5.12
7	pre-clinical studies	7.00	16.80	16.80	0.00
9	other biological sciences	7.00	9.50	10.24	5.12
11	physics & astronomy	7.00	11.25	11.25	11.25
12	chemistry	7.00	17.1	17.37	4.96
14	earth sciences	7.00	12.48	12.8	6.4
15	other physical sciences	7.00	11.25	5.31	5.31
17	electrical engineering	7.00	7.1	7.1	14.07
18	electronic engineering	7.00	7.1	7.1	14.07
21	marine engineering	7.00	7.1	7.1	14.07
22	biotechnology	7.00	13.46	12.8	6.4
27	architecture	7.00	22.39	3.66	3.66
28	building technology	7.00	15.05	15.05	3.66
29	planning	7.00	9.13	20.82	20.82
30	surveying, land	7.00	15.05	15.05	3.66
31	surveying, other	7.00	15.05	15.05	3.66
38	catering	7.00	16.2	16.2	16.2
39	hotel management	7.00	16.2	16.2	16.2
49	communications & media	7.00	19.2	19.2	0
52	art	7.00	13.9	10.52	10.52
53	performing arts	7.00	18.84	13.9	13.9
54	music	7.00	14.56	17.12	17.12
55	other creative arts	7.00	13.9	10.52	10.52
56	design	7.00	13.9	10.52	10.52
60	chinese medicine	7.00	7.1	4.66	4.66
62	optometry	7.00	8.16	2.54	1.6
63	rehabilitation science	7.00	8.16	2.54	1.6
Category D					
13	materials science	9.10	7.10	7.10	14.07
16	mech. engineering	9.10	7.10	7.10	14.07
19	chemical engineering	9.10	7.10	7.10	14.07
20	production engineering	9.10	7.10	7.10	14.07
23	materials technology	9.10	7.10	7.10	14.07
24	textile technology	9.10	7.10	7.10	14.07
25	civil engineering	9.10	7.10	7.10	14.07
26	other technologies	9.10	7.10	5.04	5.04

Hong Kong University Grants Committee
Review of Space Requirement Formulae and Standards

Figure 2. Teaching Laboratories Cognate Groupings By Departmental Cost Center

DCC	Discipline	Category			Space Factor			
		2000	Revisions	Change	NASM	WRH	SOR @ 75%	Space factor
32	Math. & Statistics	A	A	No	2.80	24	0.75	0.16
33	Computer Studies/Science	A	A	No	2.80	24	0.75	0.16
34	Law	A	A	No	2.80	24	0.75	0.16
35	Accountancy	A	A	No	2.80	24	0.75	0.16
36	Public Administration	A	A	No	2.80	24	0.75	0.16
37	Business Studies	A	A	No	2.80	24	0.75	0.16
40	Economics	A	A	No	2.80	24	0.75	0.16
42	Social Work	A	A	No	2.80	24	0.75	0.16
43	Other Social Studies	A	A	No	2.80	24	0.75	0.16
44	Chinese Lang. & Lit.	A	A	No	2.80	24	0.75	0.16
45	English Lang. & Lit.	A	A	No	2.80	24	0.75	0.16
46	Japanese Lang. & Lit.	A	A	No	2.80	24	0.75	0.16
47	Other Languages	A	A	No	2.80	24	0.75	0.16
48	Translation	A	A	No	2.80	24	0.75	0.16
50	History	A	A	No	2.80	24	0.75	0.16
51	Other Arts/Humanities	A	A	No	2.80	24	0.75	0.16
57	Education	A	A	No	2.80	24	0.75	0.16
61	Sociology	N/A	A	N/A	2.80	24	0.75	0.16
8	Psychology	B	B	No	4.90	24	0.75	0.27
41	Geography	B	B	No	4.90	24	0.75	0.27
58	Physical Education	C	B	Yes	4.90	24	0.75	0.27
59	Home Economics	B	B	No	4.90	24	0.75	0.27
99	Continuing Education	A	B	Yes	4.90	24	0.75	0.27
1	Clinical Medicine	C	C	No	7.00	20	0.75	0.47
2	Clinical Dentistry	C	C	No	7.00	20	0.75	0.47
4	Nursing	B	C	Yes	7.00	20	0.75	0.47
5	Other Health Care Professions	C	C	No	7.00	20	0.75	0.47
6	Biological Sciences	C	C	No	7.00	20	0.75	0.47
7	Pre-clinical Studies	C	C	No	7.00	20	0.75	0.47
9	Other Biological Sciences	C	C	No	7.00	20	0.75	0.47
11	Physics & Astronomy	B	C	Yes	7.00	20	0.75	0.47
12	Chemistry	B	C	Yes	7.00	20	0.75	0.47
14	Earth Sciences	B	C	Yes	7.00	20	0.75	0.47
15	Other Physical Sciences	B	C	Yes	7.00	20	0.75	0.47
17	Electrical Engineering	D	C	Yes	7.00	20	0.75	0.47
18	Electronic Engineering	D	C	Yes	7.00	20	0.75	0.47
21	Marine Engineering	D	C	Yes	7.00	20	0.75	0.47
22	Biotechnology	C	C	No	7.00	20	0.75	0.47
27	Architecture	C	C	No	7.00	20	0.75	0.47
28	Building Technology	C	C	No	7.00	20	0.75	0.47
29	Planning	C	C	No	7.00	20	0.75	0.47
30	Surveying, Land	B	C	Yes	7.00	20	0.75	0.47
31	Surveying, Other	B	C	Yes	7.00	20	0.75	0.47
38	Catering	C	C	No	7.00	20	0.75	0.47
39	Hotel Management	C	C	No	7.00	20	0.75	0.47
49	Communications & Media	A	C	Yes	7.00	20	0.75	0.47
52	Art	D	C	Yes	7.00	20	0.75	0.47
53	Performing Arts	D	C	Yes	7.00	20	0.75	0.47
54	Music	B	C	Yes	7.00	20	0.75	0.47
55	Other Creative Arts	D	C	Yes	7.00	20	0.75	0.47
56	Design	D	C	Yes	7.00	20	0.75	0.47
60	Chinese Medicine	C	C	No	7.00	20	0.75	0.47
62	Optometry	N/A	C	N/A	7.00	20	0.75	0.47
63	Rehabilitation	N/A	C	N/A	7.00	20	0.75	0.47
13	Materials Science	D	D	No	9.10	20	0.75	0.61
16	Mechanical Engineering	D	D	No	9.10	20	0.75	0.61
19	Chemical Engineering	D	D	No	9.10	20	0.75	0.61
20	Production Engineering	D	D	No	9.10	20	0.75	0.61
23	Materials Technology	D	D	No	9.10	20	0.75	0.61
24	Textile Technology	D	D	No	9.10	20	0.75	0.61
25	Civil Engineering	D	D	No	9.10	20	0.75	0.61
26	Other Technologies	D	D	No	9.10	20	0.75	0.61

Review of Space Requirements Formula and Standards

Figure 3. Research Laboratories Cognate Groupings by Departmental Cost Center

DCC	Discipline	2000	Category Revision	Change	Space factor (NASM)
30	Surveying, Land	A	A	No	100
31	Surveying, Other	A	A	No	100
32	Math. & Statistics	A	A	No	100
34	Law	A	A	No	100
35	Accountancy	A	A	No	100
36	Public Administration	A	A	No	100
37	Business Studies	A	A	No	100
40	Economics	A	A	No	100
42	Social Work	A	A	No	100
43	Other Social Studies	A	A	No	100
44	Chinese Lang. & Lit.	A	A	No	100
45	English Lang. & Lit.	A	A	No	100
46	Japanese Lang. & Lit.	A	A	No	100
47	Other Languages	A	A	No	100
48	Translation	A	A	No	100
50	History	A	A	No	100
51	Other Arts/Humanities	A	A	No	100
57	Education	A	A	No	100
61	Sociology	N/A	A	N/A	100
99	Continuing Education	A	A	No	100
29	Planning	C	B	Yes	300
33	Computer Studies/Science	B	B	No	300
38	Catering	B	B	No	300
39	Hotel Management	A	B	Yes	300
41	Geography	B	B	No	300
58	Physical Education	C	B	Yes	300
59	Home Economics	A	B	Yes	300
27	Architecture	C	C	No	500
28	Building Technology	C	C	No	500
49	Communications & Media	B	C	Yes	500
52	Art	E	C	Yes	500
53	Performing Arts	E	C	Yes	500
54	Music	E	C	Yes	500
55	Other Creative Arts	E	C	Yes	500
56	Design	E	C	Yes	500
4	Nursing	D	D	No	650
5	Other Health Care Professions	D	D	No	650
8	Psychology	D	D	No	650
17	Electrical Engineering	D	D	No	650
18	Electronic Engineering	D	D	No	650
20	Production Engineering	D	D	No	650
23	Materials Technology	D	D	No	650
25	Civil Engineering	D	D	No	650
26	Other Technologies	D	D	No	650
63	Rehabilitation Science	N/A	D	N/A	650
1	Clinical Medicine	E	E	No	800
2	Clinical Dentistry	E	E	No	800
6	Biological Sciences	E	E	No	800
7	Pre-clinical Studies	E	E	No	800
9	Other Biological Sciences	E	E	No	800
11	Physics & Astronomy	E	E	No	800
12	Chemistry	E	E	No	800
13	Materials Science	D	E	Yes	800
14	Earth Sciences	D	E	Yes	800
15	Other Physical Sciences	E	E	No	800
16	Mechanical Engineering	D	E	Yes	800
19	Chemical Engineering	D	E	Yes	800
21	Marine Engineering	D	E	Yes	800
22	Biotechnology	E	E	No	800
24	Textile Technology	E	E	No	800
60	Chinese Medicine	E	E	No	800
62	Optometry	N/A	E	N/A	800