

UNIVERSITY IN NORTHERN CAPE
CALCULATION OF BUILDING AND OTHER COSTS

Department of Higher Education and Training

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V3b

1. Introduction

This document summarizes the technical detail associated with a HEMIS building cost calculation for the proposed University in Northern Cape. The HEMIS Building Space and Cost Norms of the DHET are used as basis for this calculation. Apart from building costs an estimate is also made of other related costs. The costings are made from a point of view of the State and not from the point of view of the future council – student fees for example are therefore not taken into account in this document.

Because of monetary constraints, especially at the start-up of this University, a phased growth option will be considered for the University starting with a relatively few qualifications but gradually introducing some of the qualifications on offer up to 2020 with the university still achieving its target by 2024. The requirement of meeting the target size of the university by 2024, would result in some qualifications growing at a very steep rate which suggests that the said date be revisited by the future university council.

Furthermore, the qualifications to be offered listed in this document and the dates on which they are suggested to be introduced, should be regarded as indicative of the type of scenario required to meet the monetary constraints and the timescales involved. Much more input would be required from the academic advisors to the project.

The HEMIS Building Space and Cost Norms are norms relating to a linear model (passing through the origin) which connects the space needed and the costs to be incurred to provide that space to student FTE's of a particular type. The costs are expressed in terms of a specific "currency" - the cost unit – whose value is annually updated by using the BER/MFA building cost indices. These costs are also predicted into the future. Costs calculated in this way include building escalation and are fixed in terms of the cost unit value of the year in which the building will be completed. By definition, one cost unit is the cost to establish 1 ASM of office space. The Rand value of one cost unit is R18 322 in 2012. All costs in this document will be expressed in terms of the Rand of 2012.

A brief exposition of the cost calculations for the University in the NC is given below.

2. University in the Northern Cape

According to announcements made by the Minister of Higher Education and Training, the proposed University is a national asset serving national interests and more specifically the interests of the Northern Cape region.

The University will be a comprehensive university with a maximum of 5 000 FTE students to be enrolled in the medium term. Comprehensive here means a university offering a combination of academic programmes usually offered by universities of technology and by the traditional universities. The University will therefore offer programmes to students ranging from vocational and professional to general formative. The University will open its doors to new students as from the beginning of 2014 and will for the time being operate from a single campus in Kimberley.

The University will not offer any postgraduate studies in the short term, but the presence of two centres of research excellence at the University will eventually pave the way for the introduction of postgraduate studies.

Because of the proven advantages of accommodating students in residences on-campus, a maximum of 80% of the headcount of the University will be housed in on-campus residences.

Further detail about the strategic drivers for this university can be found in the Development Framework for the University.

2.1 The Programme Qualification Mix (PQM) of the University

The following programmes have provisionally been included in the PQM of the University as part of its specific growth strategy:

QUALIFICATION	ABBREVIATION	FIRST INTAKE IN FTE's						
		2014	2015	2016	2017	2018	2019	2020
N Dip in Fine Arts	ND Fine Arts			60	60	60	60	60
H Cert in Financial Information Systems	HC Fin IS			60	60	60	60	60
N Dip in Entrepreneurship	ND Entrpr	60	60	60	60	60	60	60
N Dip in Hospitality Management	ND Hosp Man		60	60	60	60	60	60
N Dip in Small Business Management	ND S Buss M		60	60	60	60	60	60
N Dip in Public Management	ND Pub Man	60	60	60	60	60	60	60
B Admin	B Admin					60	60	60
B Social Work	B Soc Work					60	60	60
B ED (Foundation Phase)	B Ed					60	60	60
B of Nursing Science	B Cur					60	60	60
Diploma in Nursing Science	ND Nurs				60	60	60	60
N Dip in Agriculture	ND Agric				60	60	60	60
N Dip in Metallurgical Engineering	ND Met Eng					60	60	60
N Dip in Engineering: Computer Systems	ND Comp Eng					60	60	60
B Eng (Computer and Electronic)	B Eng Comp					60	60	60
N Dip in Financial Information Systems	ND Fin IS			60	60	60	60	60
H Cert in Emergency Medical Care	HC EMC			60	60	60	60	60

The programmes to be selected should eventually constitute a balance between the various programme types defining this specific comprehensive university. Specific attention should also be given to the scarce skills fields regarded as priority study fields by the Minister of Higher Education and Training, and the issue of national and regional foci. A balance also has to be struck between popular programmes and less popular ones in order to ensure future financial sustainability.

These programmes are still subject to further debate and scrutiny by the academic community and should at this stage be regarded as indicative of the future programmes to be offered by the new University. In order to meet the deadlines for the construction of new buildings, however, these qualifications would have to be used for such a broader planning purpose. Minor changes in the academic curriculum do not have a significant change in the costing of the buildings to be built.

2.2 Enrolment planning for the University

With the maximum size of the University being set equal to 5 000 FTE students over the medium term, it is essential to properly plan the growth of the University and to ensure that the provision of staff and facilities match the growth in student numbers.

An enrolment plan has been compiled which provides for the phased introduction of the different programmes, leaving sufficient lead time for the approval of qualifications offered under the auspices of the various professional councils. Assuming typical progression and graduation patterns for each of these qualifications, and assuming an annual intake of 60 FTE students for each of these qualifications (as shown in Table 1) and an accelerated growth six years after the qualification had been introduced, would bring the University to its target of 5 000 FTE students by 2024. This would provide for a growth period of about 10 years to reach the intermediate size target as set by the Minister.

The growth of the University as spread across the 20 different CESM study fields is captured in the table below - each qualification of course feeds into a different combination of study fields or CESM categories.

UNIVERSITY FTE's	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
01 Agriculture	0	0	0	52	94	126	145	152	155	189	231
02 Architecture	0	0	0	0	0	0	0	0	0	0	0
03 Arts	0	0	60	107	145	166	175	178	217	265	324
04 Business	53	202	375	501	592	642	703	824	994	1 199	1 464
05 Communication	0	3	5	6	9	11	12	14	17	19	23
06 Computer Sc	0	4	45	77	112	135	151	161	186	216	264
07 Education	7	12	25	34	100	155	205	246	277	300	366
08 Engineering	0	0	0	0	115	204	274	317	338	348	425
09 Health	0	0	45	131	208	270	311	338	368	430	525
10 Family Ecology	0	3	5	10	13	15	17	19	21	26	32
11 Languages	0	0	0	0	7	12	17	20	21	22	27
12 Law	0	5	17	27	37	44	48	53	62	73	89
13 Life Sc	0	0	10	23	46	64	79	90	100	111	136
14 Physical Sc	0	0	3	5	27	45	60	70	76	80	97
15 Maths	0	0	10	17	48	71	89	100	110	119	145
16 Military Sc	0	0	0	0	0	0	0	0	0	0	0
17 Philosophy	0	0	0	0	4	7	9	11	12	12	15
18 Psychology	0	0	0	0	24	43	60	70	76	79	96
19 Public Man	60	107	145	166	184	194	240	290	350	422	516
20 Social Sc	0	0	0	2	53	97	133	161	176	184	225
Total FTE	120	335	744	1 158	1 816	2 303	2 726	3 113	3 555	4 093	5 000
FTE using instit housing	125	348	773	1 203	1 886	2 393	2 832	3 234	3 694	4 253	5 195

2.3 Academic organizational structure

As a start-up position, four faculties have been selected as a basis for the academic organizational structure, namely the Faculty of Science and Information Technology; the Faculty of Engineering and Applied Sciences; the Faculty of Humanities and Business Management; and the Faculty of Arts. Each of these faculties would operate within the CESM fields of study as indicated by the four colours appearing in the diagram above. Each qualification will be assigned to one of these four faculties on the basis of the main CESM field of specialization of these qualifications. Cost considerations has limited the number of faculties to four but the University may introduce more faculties when growing beyond 5 000 FTE students.

2.4 Space requirements for the University

In terms of the HEMIS space norms, the space requirement of the University during the period 2014 to 2024 is given by the Table below:

UNIVERSITY ASM	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Faculty of Eng & Applied Sci Total	0	0	0	0	787	1 397	1 879	2 169	2 315	2 382	2 909
Class laboratories	0	0	0	0	523	928	1 248	1 441	1 537	1 582	1 933
Non-class laboratories	0	0	0	0	92	163	219	253	270	278	340
Offices	0	0	0	0	172	306	412	475	507	522	637
Faculty of Hum & Bus Man Total	230	623	1 074	1 395	1 972	2 398	2 861	3 393	3 969	4 593	5 611
Class laboratories	44	114	196	254	409	529	650	774	894	1 015	1 239
Non-class laboratories	96	263	453	589	807	964	1 141	1 352	1 587	1 847	2 256
Offices	90	246	425	552	757	904	1 070	1 267	1 488	1 732	2 115
Faculty of Science & IT Total	0	31	502	1 409	2 435	3 235	3 778	4 126	4 502	5 206	6 360
Class laboratories	0	19	264	742	1 286	1 710	1 998	2 185	2 385	2 757	3 368
Non-class laboratories	0	5	94	252	438	582	680	743	813	937	1 145
Offices	0	8	144	414	711	943	1 099	1 198	1 305	1 512	1 847
Faculty of Arts Total	0	0	423	757	1 020	1 168	1 231	1 253	1 530	1 869	2 283
Class laboratories	0	0	300	537	723	828	873	888	1 085	1 326	1 619
Non-class laboratories	0	0	48	86	116	133	140	142	174	212	259
Offices	0	0	75	134	181	207	218	222	271	331	405
Classrooms Total	114	339	760	1 196	1 952	2 516	2 996	3 425	3 891	4 451	5 437
Campus library Total	186	519	1 153	1 795	2 814	3 569	4 225	4 824	5 511	6 344	7 750
Study space	174	485	1 079	1 679	2 633	3 339	3 953	4 513	5 155	5 935	7 250
Offices	12	33	74	116	182	230	273	311	356	409	500
Institut and acad support Total	405	1 131	2 513	3 912	6 134	7 780	9 209	10 515	12 011	13 828	16 892
Offices	70	195	434	675	1 058	1 343	1 589	1 815	2 073	2 386	2 915
Special use	335	936	2 080	3 237	5 075	6 437	7 620	8 701	9 938	11 442	13 977
Educational and Gen Total ASM	936	2 644	6 425	10 463	17 113	22 063	26 180	29 705	33 729	38 674	47 243
Residences Total ASM	1 944	5 424	12 053	18 760	29 414	37 307	44 161	50 424	57 598	66 312	81 003
Grand total ASM	2 880	8 068	18 479	29 223	46 527	59 370	70 340	80 130	91 326	104 986	128 246
Total campus FTE students	120	335	744	1 158	1 816	2 303	2 726	3 113	3 555	4 093	5 000
FTE stud using institutional housing	125	348	773	1 203	1 886	2 393	2 832	3 234	3 694	4 253	5 195

This table defines the ASM's for academic and administrative space and the ASM's for residential space required by the University in 2024 in terms of the growth strategy adopted.

2.5 Providing building space of the right type to the University in time

One of the biggest challenges faced by the University is to ensure that enough building space of the right type would be available for the student enrolments planned as from the beginning of 2014 – this is a particularly serious challenge because at the time of writing this Report, only 15 months remain to construct a number of new buildings. Already at this stage it seems that the beginning of 2015 would be the first date for the completion of new buildings. The first academic year would therefore require special measures to find temporary accommodation.

It needs to be stated that a considerable number of generous offers had been made to the future University in respect of buildings that will be donated to the University or space that will be made available to the University at a charge or free of charge. Each of these offers has its own dynamics and risks which may well eventually prevent the University from opening its doors in 2014. For this

reason it is suggested that each of these offers (especially the more complex ones) be taken up later and be given a role in the future provisioning of building space to the University. However, to minimize the risk for the University at this stage, it should base its planning on what buildings it could reasonably still construct before the beginning of 2015 (especially the specialized spaces) and on what building space it can rent by signing a contract within the near future.

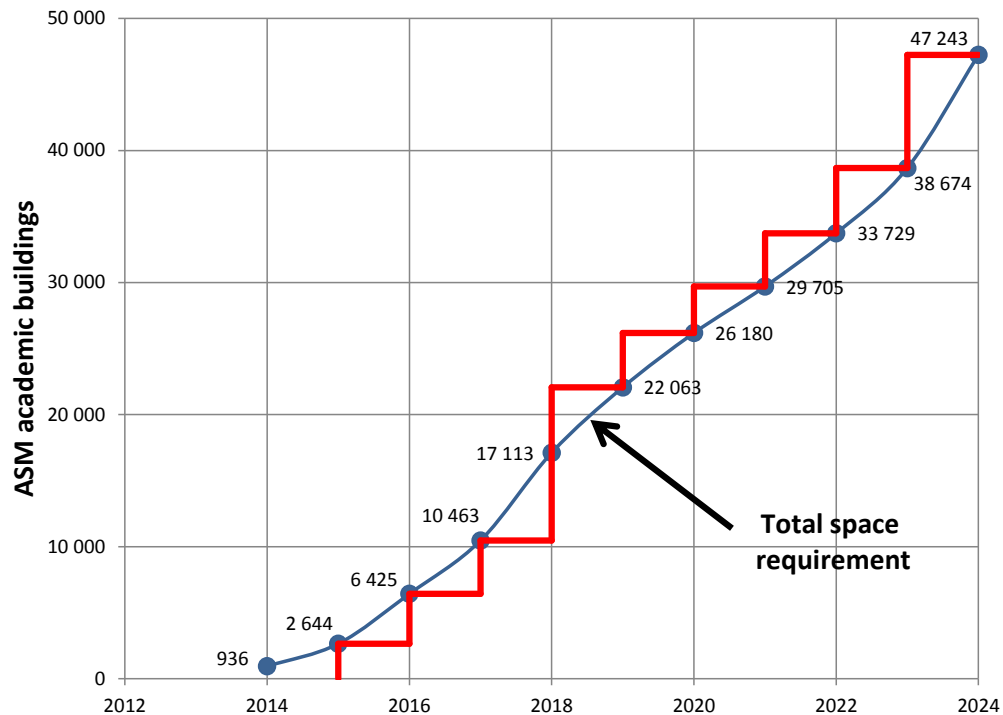
As regards the construction of buildings on the Campus, it is suggested that this be broken down into smaller chunks which can be handled in a single year. Initially just enough space will be built to provide students with the facilities they require for 2015. This will be repeated for the facilities required for 2016 and 2017. It needs to be pointed out that this strategy will reduce the cash flow required by the University during its start-up years considerably, but will require considerable effort to manage construction schedules properly to meet deadlines. For this reason it is proposed that space associated with an extra year's growth be provided as from 2018 and onwards. The table below shows the number of ASM's to be constructed in each year and how much building space should be commissioned at the beginning of the next academic year.

	First year	CONSTRUCTION YEAR OF SPACE									Total
		2014	2015	2016	2017	2018	2019	2020	2021	2022	
Total academic & admin ASM	936	2 644	3 782	4 038	11 600	4 116	3 526	4 024	4 946	8 568	47 243
Classrooms	114	339	421	435	1 321	480	429	466	560	986	5 437
Library	186	519	634	642	1 774	656	599	686	834	1 406	7 750
Offices Institut support	70	195	239	241	667	247	225	258	314	529	2 915
Special Use Institut support	335	936	1 144	1 157	3 200	1 183	1 081	1 238	1 504	2 535	13 977
Labs Science & IT	0	24	335	636	1 298	386	250	269	497	818	4 513
Labs Eng & Appl Sciences	0	0	0	0	1 091	377	226	114	52	412	2 272
All space Hum & Bus Management	230	623	451	321	1 003	463	532	576	624	1 018	5 611
Offices Eng & Appl Sciences	0	0	0	0	306	106	63	32	15	116	637
All space Arts	0	0	423	334	411	64	21	277	339	414	2 283
Offices Science & IT	0	8	136	271	529	156	99	107	207	335	1 847
Total residence ASM		5 424	6 629	6 707	18 546	6 854	6 264	7 173	8 714	14 691	81 003

Residence beds required in first year with floor area required of 1 944 ASM

The table above also shows that 963 ASM of building space should be provided on an ad hoc basis for 2014 to allow the university to open its doors at the beginning of the 2014 academic year.

The following diagram summarizes the quantum and timing of the different building phases:



2.6 Other related costs

Land improvements other than buildings: This cost is added to the cost of the construction of buildings to provide for landscaping, parking areas, water and storm water reticulation networks, etc. This runs at 13% of the cost of the buildings according to the HEMIS norms.

Sports amenities: This is provided on an *ad hoc basis* and a provision of R300 million has been made on the basis of facilities provided for similar sized institutions.

Loose equipment, furniture, library books: This is provided on an *ad hoc basis* and a provision of approximately R800 million has been made by using estimates based on the previous subsidy formula for universities of a similar size. The attention is drawn to the fact that equipment fixed to a building (in contrast to loose equipment) is regarded as part of building costs.

Special projects: This relates to special *ad hoc* provisions to cover the costs of for example the greening of buildings, the provision of WiFi infrastructure for wireless ICT connectivity, etc. A provision of R240 million has been made in this case.

Operating expenditure: Universities are expected to cover most of the operating expenditures from student class fees and from State allocations made according to the so-called Funding Framework for universities. The said allocations require complex calculations but estimates have been made by using the outcomes for similar sized universities of the same composition. These estimates are shown in Tables below.

2.7 Budget and Cash flow summary

The Table below summarizes the cash flow requirements as defined in the previous paragraphs for the growth strategy selected.

(Rm of 2012)	2012	2013	2014	2015	2016	2017	2018	2 019	2 020	2 021	2 022	Total
Operating expenditure	10	22	35	54	69	82	93	107	123	150	745	
Funding framework	10	22	35	54	69	82	93	107	123	150	745	
Capital expenditure	98	327	433	386	907	337	302	341	413	690	4 233	
1. Academic & admin buildings	0	55	79	86	248	88	75	85	105	182	1 002	
2. Residence buildings	0	102	125	126	349	129	118	135	164	276	1 522	
3. Land improv other than buildings	0	20	26	28	77	28	25	29	35	60	328	
4. Sports amenities	80	80	100	40							300	
5. Loose equipm, furn, libr books	18	34	68	71	199	72	64	73	90	153	841	
6. Special projects (green build, etc)		35	35	35	35	20	20	20	20	20	240	
Total	108	349	468	440	976	418	395	448	536	840	4 979	
Inflated values BER	96	344	519	542	1335	635						

In this table the costs are expressed in the Rand of 2012. These costs which mainly relate to building costs can be escalated by using the predicted values of the HEMIS building cost units.