Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
1.	5 Dec 2013	FoS	http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/second-major-financial-mathematics For the Financial Mathematics Second Major The words highlighted in yellow have been added:	

Module Level	Second Major Requirements		Cumulative Major MCs
Level-1000 (16 MCs)	Pass IT1006 or CS1010/ CS1010E/ CS1010S MA1101R or MA1506 or MA1508 MA1102R or MA1505 or MA1507 / MA1521 MA1104 or MA2501	MATLAB Programming for Mathematics Programming Methodology Linear Algebra I Mathematics II Linear Algebra with Applications Calculus Mathematics I Advanced Calculus or Calculus for Computing Multivariable Calculus Differential Equations and Systems	16

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
2.	18 Dec 2013	FoS	http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/statistics For the Statistics Major the changes highlighted in yellow have been made: To be awarded a B.Sc. or B.Sc. (Hons.) with a primary major in Statistics, candidates must satisfy the following:	

Module Level	Major Requirements	Cumulative Major MCs
Level-1000 (16 MCs)	Pass ST1131 Introduction to Statistics ~~or~~ ~~ST1131A Introduction to Statistics~~ or ST1232 Statistics for Life Sciences MA1101R Linear Algebra I MA1102R Calculus CS1010 Programming Methodology or CS1010E Programming Methodology or CS1010S Programming Methodology ~~or~~ ~~CG1101 Programming Methodology~~	16

List A
MA3209 Mathematical Analysis III
MA3218 Coding Theory
MA3227 Numerical Analysis II
MA3229 Introduction to Geometric Modelling
MA3233 ~~Algorithmic Graph Theory~~ Combinatorics and Graphs II
MA3236 Nonlinear Programming
MA3245 Financial Mathematics I *or* MA3269 Mathematical Finance I
MA3252 Linear and Network Optimisation
MA3256 Applied Cryptography
MA3259 Mathematical Methods in Genomics
QF3101 Investment instruments: Theory and Computation
CS3230 Design and Analysis of Algorithm
CS3223 Database Management Systems
CS3233 Database Systems Implementation
CS3243 Foundations of Artificial Intelligence
CS3244 Machine Learning and Neural Networks
EC3304 Econometrics II

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
3.	18 Dec 2013	FoS	http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/mathematics-and-applied-mathematics	

For the major in Applied Mathematics

The words highlighted in yellow have been added:

Graduation Requirements (Applied Mathematics)
To be awarded a B.Sc. or B.Sc. (Hons.) with a primary major in Applied Mathematics, a candidate must satisfy the following:

Module Level	Major Requirements	Cumulative Major MCs
Level 1000 (20 MC)	1. Pass the four modules in List I 2. Pass ~~one of the following modules~~: - CS1010/CS1010E/CS1010S Programming Methodology - ~~IT1006 MATLAB Programming for Mathematics~~	20
Level-2000 (20-23 MCs)	3. Pass all the following modules: - MA2101/MA2101S Linear Algebra II - MA2108/MA2108S Mathematical Analysis I - MA2213 Numerical Analysis I - MA2216/ST2131 Probability 4. Pass one additional module from List II, III, IV	40-43
Level-3000 (24-26 MCs)	5. Pass all the following modules: - MA3110/MA3110S Mathematical Analysis II - MA3111/MA3111S Complex Analysis I 6. Pass two modules from List AM3 7. Pass two additional modules from List III, IV	64-69
Level-4000 (36 MCs)	8. Pass MA4199 Honours Project in Mathematics 9. Pass four modules from List AM4 10. Pass two additional modules from List IV	100-105
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics	

List AM3

MA3209 Mathematical Analysis III
MA3220 Ordinary Differential Equations

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td>4.</td><td>18 Dec 2013</td><td>FoS</td><td>
http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/quantitative-finance

For the Major in Quantitative Finance

The words highlighted in yellow have been added:

Graduation Requirements To be awarded a B.Sc. or B.Sc. (Hons.) with a primary major in Quantitative Finance, candidates must satisfy the following:

<table>
<tr><td>Module Level</td><td>Major Requirements</td><td>Cumulative Major MCs</td></tr>
<tr><td>Level 1000 (24 MCs)</td><td>CS1010/ CS1010E/ CS1010S Programming Methodology
CS1020/ CS1020E Data Structures and Algorithms I
ACC1002 Accounting
MA1101R Linear Algebra I
MA1102R Calculus
MA1104 Multivariable Calculus</td><td>24</td></tr>
<tr><td>Level 2000 (20-21 MCs)</td><td>Pass

FIN2004 Finance
MA2213 Numerical Analysis I
MA2216/ Probability
ST2131
QF2101 Basic Financial Mathematics

One module from the following:

- MA2101/ Linear Algebra II MA2101S
- MA2108/ Mathematical MA2108S Analysis I
- ST2132 Mathematical</td><td>44-45</td></tr>
</table>
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates				Remarks
				Statistics - ST2137 Computer Aided Data Analysis			
			Level 3000 (24 MCs)	Pass QF3101 Investment Instruments: Theory and Computation MA3245 Financial Mathematical I Two modules from the following: - QF3201 Basic Derivatives and Bonds - CS3230 Designs and Analysis of Algorithms - MA3220 Ordinary Differential Equations – - MA3236 Nonlinear Programming - MA3252 Linear and Network Optimisation - MA3264 Mathematical Modelling - ST3131 Regression Analysis Two modules from the following: - FIN3101 Corporate Finance - FIN3103 Financial Markets - FIN3117 Bank Management - FIN3118 Financial Risk Management	68-69		

Bulletin Updates AY2013/14							
S/N	**Date**	**Faculty/ School/**	**Updates**				**Remarks**
			Level-4000 and above (32 MCs)	Pass QF4199 Honours Project in Quantitative Finance QF4102 Financial Modelling MA4257 Financial Mathematics II Three modules from the following: - QF4201 Financial Time Series: Theory and Computation - FIN4111 Research Methods in Finance - FIN4112 Seminar in Finance - MA4254 Discrete Optimisation - MA4255 Numerical Partial Differential Equations - MA4260 Stochastic Operations Research - MA4264 Game Theory ~~- MA4267 Discrete Time Finance~~ - ST4233 Linear Models - ST4245 Statistical Methods for Finance - MA5245 Advanced Financial Mathematics - MA5248 Stochastic Analysis in Mathematical Finance	100-101		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
5.	5 Dec 2013	FoS	http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/minor-mathematics **For the Minor in Mathematics, the Requirements for the Minor have been amended with the changes in blue:** To qualify for a Minor in Mathematics, a student should pass 6 non-overlapping modules of the following type: 1. Any 2 of the following modules: o MA1xxx modules except MA1301 o CS1231 2. Any 2 MA2xxx modules 3. Any 2 MA3xxx or higher modules, excluding MA3311 and MA3312. Note that these ST and MA modules are crosslisted: ST2131 with MA2216, ST3236 with MA3238, and ST4238 with MA4251. This minor is not awarded with the primary major in Applied Mathematics, Computational/Quantitative Finance, Mathematics and second major in Mathematics or Financial Mathematics. **For the Minor in Statistics, the Requirements for the Minor have been amended with the changes in blue:** To be awarded this minor, students must: 1. Pass one of the following: 1. MA1102R Calculus 2. MA1312 Calculus with Applications 3. MA1507 Advanced Calculus 4. MA1505 Mathematics I 5. MA1521 Calculus for Computing 2. Pass ST2131 Probability or ST2334 Probability and Statistics; 3. Pass ST2132 Mathematical Statistics and ST3131 Regression Analysis; and 4. Pass one module from ST32xxx, and one other module from ST32xxx, EC3304 Econometrics II, EC4303 Econometrics III, IE3101 Statistics for Engineering Applications, DSC3215 Stochastic Models in Management, FIN3116 Options and Future, FIN3119 Risk and Insurance, MA3259 Mathematical Methods in Genomics and LSM3241 Bioinformatics and Biocomputing. This minor is not awarded with a primary major in Statistics, Statistics with specialisation in Biostatistics or Statistics with specialisation in Finance and Business Statistics and second major in Statistics.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
6.	18 Dec 2013	FoS	http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/minor-aquatic-ecology **The following changes (highlighted in yellow) have been made:** **Minor in Aquatic Ecology** Host Faculties: • Faculty of Arts and Social Sciences (Department of Geography) • Faculty of Science (Department of Biological Sciences) • The Minor in Aquatic Ecology aims to expose students to the important disciplines of marine and freshwater ecological studies while developing relevant specific skills, knowledge, and experience among them. With the increasing governmental, private, and societal interest in aquatic sciences, there is a growing demand for manpower with expertise in freshwater and/or marine ecology. This Minor complements aptly the primary disciplines of students from the Life Sciences Major and Geography Major. It will also enhance the training for students keen on related career opportunities at relevant governmental and private institutions in Singapore, including Public Utilities Board (PUB), National Environment Agency (NEA), National Parks Board (NParks), The Maritime and Port Authority of Singapore (MPA), Tropical Marine Science Institute (TMSI), DHI Group, and Singapore-Delft Water Alliance (SDWA). To be awarded a minor in Aquatic Ecology, a student must pass the six modules as set out below: 1. LSM1103 Biodiversity 2. LSM2251 Ecology and Environment 3. GE2229 Water and Environment 4. ~~SP3202~~ SP3203 Aquatic Ecology Research 5. Choose 2 from the following elective modules: o GE2215 Introduction to GIS and Remote Sensing o GE2220 Terrestrial and Coastal Environments o GE2228 Weather and Climate o GE3216 Applications of GIS & Remote Sensing o GE3221 Ecological Systems o GE3223 Environmental Change in the Tropics o ~~GEK1543 Chemistry of the Ocean~~ GEK1548 How the Ocean Works o LSM3254 Ecology of Aquatic Environments o LSM3264 Environmental Biochemistry o LSM4261 Marine Biology o LSM4264 Freshwater Biology o LSM4266 Topics in Aquatic Biodiversity o Application is required to read this minor. For the application process and more information, please refer to ~~http://www.lifesciences.nus.edu.sg.~~ http://www.lifesciences.nus.edu.sg/info/AE_Minor.pdf.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
7.	18 Dec 2013	SSHSPH	http://www.nus.edu.sg/registrar/nusbulletin/saw-swee-hock-school-public-health/contactinfo	

Key Contact Information

For up-to-date information, please visit the School's website at: http://www.sph.nus.edu.sg/

Title & Name	Designation/Responsibility	Telephone	Email (XXXX@nus.edu.sg)
Prof CHIA Kee Seng	Dean	6516 4971	ephcks
Assoc Prof LEE Jen Mai, Jeannette	Vice-Dean (Education) Programme Director, Master of Public Health programme	6516 4964	ephleej
Assoc Prof LIM Yee Wei	Vice-Dean (Research) Domain Leader (Health Education and Promotion)	6516 4981	ephlyw
Assoc Prof Rob Martinus VAN DAM	Domain Leader (Epidemiology) Programme Director, Graduate Research Programmes	6516 4980	ephrmvd
Assoc Prof TEO Yik Ying	Domain Leader (Biostatistics)	6516 2760	ephtyy
Prof VRIJHOEF Hubertus Johannes Maria	Domain Leader (Health Systems and Policy)	6516 4967	ephvhjm
Assoc Prof KOH Choon Huat, Gerald	Director, Undergraduate Medical Curriculum	6516 4979	ephkohch
Ms Elizabeth A JAHNCKE	Associate Programme Director, Master of Public Health programme	6601 2858	epheaj

Administrative Coordinators

Title & Name	Designation/Responsibility	Telephone	Email (XXXX@nus.edu.sg)
Mrs LAI Diane	Senior Assistant Manager (Undergraduate Programme)	6516 6914	ephbpcd
Ms LIM Poh Choo	Assistant Manager (Undergraduate Medical Curriculum)	6516 4960	ephlimpc

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
8.	18 Dec 2013	SDE	http://www.nus.edu.sg/registrar/nusbulletin/school-design-environment/contactinfo **2. Key Contact Information** For up-to-date information, please refer to the School's website at: *http://www.sde.nus.edu.sg*	

Title & Name	Designation/Responsibility	Telephone (6516-XXXX)	Email (XXXX@nus.edu.sg)
Prof HENG Chye Kiang	Dean	3475	sdedean
Assoc Prof LIM Ee Man, Joseph	Vice-Dean (Academic Affairs)	3439	sdelimem
Assoc Prof CHEONG Kok Wai, David	Asst-Dean (Academic Affairs)	5081	sdeckw
Assoc Prof Florence LING Yean Yng	Vice-Dean (Admin & Finance)	3401	sdelyy
Assoc Prof FU Yuming	Vice-Dean (Research)	4412	sdefuym
Assoc Prof WONG Yunn Chii	Head, Dept. of **Architecture**	3452	akihead
Assoc Prof Willie TAN	Head, Dept. of **Building**	3487 / 3413	bdgtanw
Prof DENG YongHeng	Head, Dept. of **Real Estate**	3469	rsthead
Assoc Prof YEN Ching-Chiuan	Head, Division of **Industrial Design**	3524	didhead
Assoc Prof CHEAH Kok Ming	Dy Head, Dept. of **Architecture**	3455	akickm
Prof WONG Nyuk Hien	Dy Head, Dept. of **Building**	3423	bdgwnh
Assoc Prof OOI Thian Leong, Joseph	Dy Head, Dept. of **Real Estate**	3564	rstooitl
UNDERGRADUATE COURSEWORK			
Assoc Prof CHEAH Kok Ming	Programme Director, B.A. **(Architecture)** (Hons.)	3455	akickm
Mr Fong Hoo Cheong	Level-1000 Advisor, B.A. **(Architecture)** (Hons.)	5033	akifhc
Mr Roland Sharpe FLORES	Level-2000 Advisor, B.A. **(Architecture)** (Hons.)	66012436	akirsf
Assoc Prof TSE Swee Ling	Level-3000 Advisor, B.A. **(Architecture)** (Hons.)	3464	akitsesl
Dr TAN Beng Kiang	Level-4000 Advisor, B.A. **(Architecture)** (Hons.)	1357	akitanbk
Assoc Prof Christian Gilles	Programme Director, B.A. **(Industrial**		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
9.	18 Dec 2013	FASS	http://www.nus.edu.sg/registrar/nusbulletin/node/2579 The information highlighted in yellow has been added: Students intending to participate in SEP should be aware of the following policies and rules: 1. Minimum Residency requirements - a student registered for a Bachelor's degree must do the greater of: A. 50% of required MCs for the degree programme; OR B. 80 MCs at NUS. 2. These MCs must be earned from graded modules with assigned grade points. This means that the credits that students transfer from SEP must not exceed the minimum residency requirements. 3. Credit transfer can be done as long as students pass and receive credits for the courses read. This is applicable to both courses read on a graded basis and/or pass/fail basis. 4. A minimum of 60% of the Programme/Major must be graded and factored into the CAP. 5. A maximum of 8 MCs of Minor modules may be read on SEP to fulfil Minor requirements.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
10.	18 Dec 2013	YLLSoM	**URL:** http://www.nus.edu.sg/registrar/nusbulletin/yong-loo-lin-school-medicine/graduate-research/degree-requirements Information amended highlighted in yellow. Admission Requirements Ph.D. Programme • A good Master's degree in a relevant discipline or • A relevant Bachelor's degree with at least a Second Upper Class Honours or its equivalent • The degrees of Bachelor of Medicine and Bachelor of Surgery (M.B.,B.S.) or • The degree of Bachelor of Dental Surgery and • The ability to pursue research in the candidate's proposed field of advanced study. Curriculum Structure and Requirements Candidates admitted to the graduate programme will undertake research under the supervision of staff members from the School for their period of candidature, at the end of which, they submit a thesis that is examined by a Board of Examiners. In addition, they are required to fulfil a coursework component comprising the following, to graduate either with a M.Sc. or a Ph.D. degree: M.Sc. : A total of 16 modular credits comprising of two core modules + elective modules (at Level-5000) Ph.D. : A total of 24 modular credits comprising of two core modules + elective modules (at Level-5000 & 6000) To be confirmed a Ph.D. candidate, a student is required to pass a Ph.D. qualifying examination within two years from the date of admission. Candidates deemed weak in English by the School would also have to sit for the Diagnostic English Test and take additional English Language courses conducted by the Centre for English Language Communication. ~~Students from Universities where the medium of undergraduate instruction is not in English are required to take ES5001B (Intermediate Listening & Speaking) regardless of their performance in the Diagnostic English Test. In addition to ES5001B (Intermediate Listening & Speaking).~~ All PhD candidates are required to take ES5002(Advanced Level Writing) regardless of their performance in the Diagnostic English Test. Ph.D. candidates are also required to take ES5002 (Advanced Level Writing) regardless of their performance in the Diagnostic English Test. **URL:** http://www.nus.edu.sg/registrar/nusbulletin/yong-loo-lin-school-medicine/contactinfo Changes highlighted in yellow: Ms RIDASERI Binte Suparman | M.Med and Graduate Diploma | 6516 3300 | 6773 1462 | gsmbox1 **Administrative Coordinators -> A. Undergraduate Medical Studies**: Ms TAN Beow Teng Rebecca | Assistant Manager (Curriculum and Assessment) | ~~3753~~66013472 | 6778 5743 | medtbtr Mr VICKNESH S/O Thangavelu | Assistant Director (Student Affairs) | ~~3747~~66013471 | 6778 5743 | medvt Mr TAN Kong Hee Thomas | Senior Manager | ~~2805~~66013478 | 6778 5743 | medttkh	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td>11.</td><td>20 Dec 2013</td><td>CELC</td><td>
http://www.nus.edu.sg/registrar/nusbulletin/teaching-institutions/center-for-english-language-communication/contactinfo

The contact information has been amended with changes made in red:

Key Contact Information

For up-to-date information, please visit the Centre's website at: http://www.nus.edu.sg/celc

<table>
<tr><th>Title & Name</th><th>Designation/Responsibility</th><th>Telephone (6772-XXXX)</th><th>Email (XXXX@nus.edu.sg)</th></tr>
<tr><td>Assoc Prof WU Siew Mei</td><td>Director</td><td>3865</td><td>elchead</td></tr>
<tr><td>Ms Susan TAN Hui Leng</td><td>Deputy Director, Course Coordinator, ENV1202</td><td>3873</td><td>elctans</td></tr>
<tr><td><s>Mr Patrick Bernard GALLO</s></td><td><s>Associate Director (Programmes I)</s></td><td><s>1942</s></td><td><s>elcgpb</s></td></tr>
<tr><td><s>Dr Victor Matthew COLE</s></td><td><s>Associate Director (Programmes II); Course Coordinator, ES1501</s></td><td><s>3597</s></td><td><s>elcvmc</s></td></tr>
<tr><td>Dr Jeffrey MOK Chi Hoe</td><td>Associate Director <s>(Service Matters)</s> (Academic Programmes I)

Course Coordinator, <s>ES2002</s> SDE embedded courses</td><td><s>1744</s>

66011744</td><td>elcmchj</td></tr>
</table>
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
12.	20 Dec 2013	BIZ	**http://www.nus.edu.sg/registrar/nusbulletin/school-business** A new degree programme has been inserted (highlighted in red) 4.2 Coursework Programmes Degrees Offered 4.2.2 Degree Requirements 4.2.2.1 The NUS MBA 4.2.2.2 The NUS MBA Double Degree with Peking University 4.2.2.3 The NUS MBA Double Degree HEC Paris 4.2.2.4 S3 Asia MBA 4.2.2.5 The NUS MBA Double Degree in Masters in Public Policy (MPP) with Lee Kuan Yew School of Public Policy 4.2.2.6 The NUS MBA Double Degree in Masters in Public Administration (MPA) with Lee Kuan Yew School of Public Policy 4.2.2.7 Asia Pacific Executive MBA – English 4.2.2.8 Asia Pacific Executive MBA – Chinese 4.2.2.9 UCLA – NUS Executive MBA 4.2.2.10 Master of Science (Management) 4.2.2.11 Master in Public Administration and Management (in Chinese with Lee Kuan Yew School of Public Policy)	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
13.	6 Dec 2013	Policies and Procedures	**URL:** http://nus.edu.sg/registrar/edu/UG/graduation.html#APCExe **Advanced Placement Credits and Exemption** The changes are highlighted in red. (C) Students from other tertiary institutions recognised by the University who have declared themselves as transfer students at the point of application for admission and are seeking APCs or exemption should apply to the Dean's Office of the Faculty concerned within the first week of the first semester of study. Please note that such APCs or exemption applications will be considered only at the point of admission to the University and approvals are subject to the following: • The residency requirement (see here for details); • The limit on the number of MCs that can be excluded from CAP computation (see here for details); and • Up to 8 MCs for University Level Requirements.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
14.	18 Nov 2013	Undergraduate Curriculum	**URL: http://nus.edu.sg/registrar/edu/UG/curriculum.html** **Undergraduate Curriculum Structure** The module requirements of the undergraduate curriculum provide the structure to ensure broad-based learning combined with depth of specialisation. As mentioned, they are organised around three categories of requirements: University Level Requirements, Programme Requirements, and a set of Unrestricted Elective Modules. **(A) University Level Requirements** These requirements aim to broaden a student's intellectual horizon, to develop critical and creative thinking skills for independent learning, and to promote spoken and written articulacy. University level requirements consist of General Education, Singapore Studies, and Breadth Modules. **General Education** General Education (GE) is concerned with the knowledge, abilities and mindset that characterise a well-educated individual. Implicit in GE at NUS is the idea that undergraduate education should go beyond its traditional focus on the understanding and application of knowledge; it should seek to empower learners to question and to critically evaluate what is presented to them as knowledge, and to engage in inquiry, discovering and constructing knowledge on their own. Accordingly, GE modules fall into two broad Subject Groups and two broad Focus Groups. **Subject Groups:** • Group A – Science & Technology • Group B – Humanities & Social Sciences The reason for the division into two subject groups is that it is valuable for students in one area of specialisation to be exposed to the knowledge and ways of thinking in the other area. ~~**Focus Groups:**~~ • ~~GK – General Knowledge~~ • ~~MI – Modes of Inquiry~~ ~~GK modules focus on what we expect University graduates to know and be able to do, while MI modules focus on ways of knowing. The critical and creative thinking in GK modules relates to the application of knowledge to the world of experience, while in MI modules, it relates to the formation of knowledge from experience.~~ The GE website gives a list of GE modules offered in the current semester.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
15.	9 Jan 2014	FoS	URL: http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/computational-biology	

Graduation Requirements

PROGRAMME REQUIREMENTS			MCs
University Requirements			
2 x General Education Modules		8	~~21 – 22~~ 20
1 x Singapore Studies Module		4	
2 x Breadth Elective Modules [2]		~~9 – 10~~ 8	
CS1101C or CS1101 or CS1101S Programming Methodology CS1102C or CS1102 or CS1102S Data Structures And Algorithms			
Faculty Requirements			16
CM1401 LSM1101 MA2213 FMS120*X*B	Chemistry for Life Sciences [1] Biochemistry Of Biomolecules [1] Numerical Analysis 1 Freshman Seminar *(x denotes the number of the seminar)* [1]		
Major Requirements			36 – 40
Level-1000 / 2000 Essential [1]			
CS1231	Discrete Structures	4	~~20~~
LSM1102	Molecular Genetics	4	
MA1101R	Linear Algebra I	4	
MA1102R	Calculus	4	
PC1432	Physics IIE	4	
CS2220	Introduction to Computational Biology [4]	4	
LSM2101 LSM2102 LSM2103	Metabolism And Regulation OR Molecular Biology OR Cell Biology	4	
LSM2201A	Experimental Biochemistry		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
16.	3 Dec 2013	FoS	URL: http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/minor-mathematics **For the Minor in Mathematics, the Requirements for the Minor have been amended with the changes in blue:** To qualify for a Minor in Mathematics, a student should pass 6 non-overlapping modules of the following type: 1. Any 2 of the following modules: o MA1xxx modules except MA1301 o CS1231 2. Any 2 MA2xxx modules 3. Any 2 MA3xxx or higher modules, excluding MA3311 and MA3312 Note that these ST and MA modules are crosslisted: ST2131 with MA2216, ST3236 with MA3238, and ST4238 with MA4251. This minor is not awarded with the primary major in Applied Mathematics, Computational/Quantitative Finance, Mathematics and second major in Mathematics or Financial Mathematics. URL: http://www.nus.edu.sg/registrar/nusbulletin/faculty-science/minor-statistics **For the Minor in Statistics, the Requirements for the Minor have been amended with the changes in blue:** To be awarded this minor, students must: 1. Pass one of the following: 1. MA1102R Calculus 2. MA1312 Calculus with Applications 3. MA1507 Advanced Calculus 4. MA1505 Mathematics I 5. MA1521 Calculus for Computing 2. Pass ST2131 Probability or ST2334 Probability and Statistics; 3. Pass ST2132 Mathematical Statistics and ST3131 Regression Analysis; and 4. Pass one module from ST32xx, and one other module from ST32xxx, EC3304 Econometrics II, EC4303 Econometrics III, IE3101 Statistics for Engineering Applications, DSC3215 Stochastic Models in Management, FIN3116 Options and Future, FIN3119 Risk and Insurance, MA3259 Mathematical Methods in Genomics and LSM3241 Bioinformatics and Biocomputing. This minor is not awarded with a primary major in Statistics, Statistics with specialisation in Biostatistics or Statistics with specialisation in Finance and Business Statistics and second major in Statistics.	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td>17.</td><td>24 Jul 2014</td><td>RO</td><td>
At url: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_GeneralInformation.pdf

Under “Degree Classification”, the criteria for degree classification for students admitted from AY2012-2013 onwards is amended as follows:

The criteria for degree classification applicable to students admitted from AY2012-2013 onwards are as follows:
<table>
<tr><th>Honours Degree Classification (i)</th><th>Criteria</th></tr>
<tr><td>Honours (Highest Distinction)</td><td>CAP 4.50 and above (ii)</td></tr>
<tr><td>Honours (Distinction)</td><td>CAP 4.00 – 4.49</td></tr>
<tr><td>Honours (Merit)</td><td>CAP 3.50 – 3.99</td></tr>
<tr><td>Honours</td><td>CAP 3.00 – 3.49</td></tr>
<tr><td>Pass</td><td>CAP 2.00 – 2.99</td></tr>
<tr><th>Bachelor's Degree Classification (iii)</th><th>Criteria</th></tr>
<tr><td>Pass with Merit</td><td>CAP 3.00 and above</td></tr>
<tr><td>Pass</td><td>CAP 2.00 – 2.99</td></tr>
</table>
(i) This refers to 160-MC degree programmes.
(ii) Particular Faculties/Schools may stipulate other requirements.
(iii) This refers to 120-MC degree programmes.
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
18.	4 Sep 2014	FoS	At url: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf Bachelor of Science (Pharmacy)/Bachelor of Science (Pharmacy) (Hons.) **C. Bachelor of Science (Pharmacy)/Bachelor of Science (Pharmacy) (Hons.) Requirements** To be awarded a Bachelor of Science (Pharm.)/ Bachelor of Science (Pharm.) (Hons.) Degree, students must have: (i) Satisfied the University Level Requirements comprising: a. 8 MCs from General Education modules (GEMs) where at least 4 MCs must come from Subject Group B (Humanities and Social Sciences); b. 4 MCs from Singapore Studies modules (SS); and c. 8 MCs from Breadth modules (electives outside students' faculty). ~~One of these modules has to be the compulsory module for Science students (except Pharmacy and Environmental Studies students), ES1541 Exploring Science Communication through popular Science (please see Section 3.3.1.7 for more details on ES1541).~~	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td>19.</td><td>11 Dec 2014</td><td>FoS</td><td>
http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf, pg 338

Amendments are highlighted in red.

Pharmaceutical Sciences Minor

(II) Curriculum Structure and Requirements

Candidates accepted into the minor programme are required to pass five (5) essential modules and one (1) elective module offered by the Department of Pharmacy. Some modules have practical component that will allow students to acquire relevant basic laboratory skills.

Essential modules:
PR1101 Physicochemical Principles of Drug Action OR PR1110 Foundations for Medicinal Chemistry
PR1102 Physical Pharmacy OR PR2114 Formulation and Technology I
GEK2506 Drug and Society
PR3101 Principles of Medicinal Chemistry OR PR2115 Medicinal Chemistry for Drug Design
PR3301 Pharmaceutical Dosage Forms

Choose one from the following elective modules:
~~PR4204 Special Drug Delivery~~
PR4205 Bioorganic Principles of Medicinal Chemistry
PR4206 Industrial Pharmacy
~~PR4208 Pharmacovigilance and Regulatory Science~~
CN4241R Engineering Principles in Drug Delivery
</td><td></td></tr>
<tr><td></td><td></td><td></td><td>
http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf (pg 219 under Chemistry major)

A. B.Sc.(Hons.) in Chemistry with Specialization in Medicinal Chemistry

To be awarded a B.Sc.(Hons.) in Chemistry with Specialization in Medicinal Chemistry, students are required to read and pass all essential modules at Level 1000 and Level 2000 under Chemistry Major Requirements and the following modules at Level 3000 and Level 4000 as set out in the tables below:

(i) For students who complete CM4199A (Honours Project in Chemistry) in the area of Medicinal Chemistry.

<table>
<tr><th>~~Level~~</th><th>~~Module Code/Title~~</th><th>~~Prerequisites~~</th><th>~~Requirements~~</th></tr>
</table>
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

3000	CM3291 Advanced Experiments in Inorganic and Organic Chemistry CM3292 Advanced Experiments in Analytical and Physical Chemistry	CM2191 Experiments in Chemistry 2 CM2192 Experiments in Chemistry 3	8 MCs Essential modules for Chemistry Major
3000/ 4000	CM3221 Organic Synthesis and Spectroscopy CM3225 Biomolecules	CM2121 CM2121	32 MCs Any eight CM modules at Level 3000 or 4000 with at least four such modules at Level 4000[a]; and at least four such modules selected from CM3221, CM3225, CM4271, CM4227, CM4273 and CM4274 as part of Specialization requirement.
	CM4271 Medicinal Chemistry CM4227 Chemical Biology CM4273 Computational Drug Design CM4274 The Art and Methodology in Total Synthesis	CM2121 and CM3225 CM2121 and CM3225 CM3221 or CM3222 CM2121	
	Other CM (or approved) modules		
4000	CM4199A Honours Project in Chemistry (in the area of Medicinal Chemistry)	Fulfilment of the requirements of the Chemistry major at B.Sc. level; and Fulfilment of 100 MCs or more with a CAP of 3.50 and above	16 MCs CM4199A is a 16 MC module; 8 MCs could be counted toward Specialization requirement.
		Total	56 MCs

*Students may take up to one Level 5000 module in place of a Level 4000 module.

Level	Module Code/Title	Prerequisites	Requirements
3000	CM3291 Advanced Experiments in Inorganic and Organic Chemistry CM3292 Advanced Experiments in Analytical and Physical Chemistry	CM2191 Experiments in Chemistry 2 CM2192 Experiments in Chemistry 3	8 MCs Essential modules for Chemistry Major
3000/ 4000	CM3221 Organic Synthesis and Spectroscopy	CM2121	(1) 32 MCs of Level 3000 and 4000 CM (or

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates				Remarks
				CM3225 Biomolecules	CM2121	specified non-CM) modules, excluding CM4199A, with at least four such modules at Level 4000[a] (2) Specialization Requirement (24MC) a) At least four modules or 16MC from (1) selected from: CM3221, CM3225, CM4271, CM4227, CM4273, CM4274, CM4215, CM5224[a], CM5245[a] and PR4205 b) CM4199A (8MC can be counted towards Specialization requirement)	
				CM4271 Medicinal Chemistry CM4227 Chemical Biology CM4273 Computational Drug Design CM4274 The Art and Methodology in Total Synthesis CM4215 Bioinorganic Chemistry CM5224 Emerging Concepts of Drug Discovery[a] CM5245 Bioanalytical Chemistry[a] PR4205 Bioorganic Principles of Medicinal Chemistry	CM2121 and CM3225 CM2121 and CM3225 CM3221 or CM3222 CM2121 CM3211 or CM3212 or CM3268 By permission By permission PR3101		
				Other CM (or approved) modules			
			4000	CM4199A Honours Project in Chemistry (in the area of Medicinal Chemistry)	Honours Eligibility Requirements for Specific Cohort	16 MCs CM4199A is a 16-MC module; 8 MCs could be counted toward Specialization requirement.	
					Total	56 MCs	

[a] Students may take up to one Level 5000 module in place of a Level 4000 module. This Level 5000 module cannot be used again to satisfy graduate studies requirement

(i) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Medicinal Chemistry.

~~Level~~	~~Module Code/Title~~	~~Prerequisites~~	~~Requirements~~
~~3000~~	~~CM3291 Advanced Experiments in Inorganic and Organic Chemistry~~	~~CM2191 Experiments in Chemistry 2~~	~~8 MCs~~ ~~Essential modules for~~

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

	~~CM3292 Advanced Experiments in Analytical and Physical Chemistry~~	~~CM2192 Experiments in Chemistry 3~~	~~Chemistry Major~~
~~3000/ 4000~~	~~CM3221 Organic Synthesis and Spectroscopy~~ ~~CM3225 Biomolecules~~	~~CM2121~~ ~~CM2121~~	~~32 MCs~~ ~~Any eight CM modules at Level 3000 or 4000 with at least four such modules at Level 4000[a]; including CM3221, CM3225, CM4271, CM4227, CM4273 and CM4274 as Specialization requirement.~~
	~~CM4271 Medicinal Chemistry~~ ~~CM4227 Chemical Biology~~ ~~CM4273 Computational Drug Design~~ ~~CM4274 The Art and Methodology in Total Synthesis~~	~~CM2121 and CM3225~~ ~~CM2121 and CM3225~~ ~~CM3221 or CM3222~~ ~~CM2121~~	
	~~Other CM (or approved) modules~~		
~~4000~~	~~CM4199A Honours Project in Chemistry (not in the area of Medicinal Chemistry)~~	~~Fulfilment of the requirements of the Chemistry major at B.Sc. level; and~~ ~~Fulfilment of 100 MCs or more with a CAP of 3.50 and above~~	~~16 MCs~~
		~~**Total**~~	~~56 MCs~~

~~[a]Students may take up to one Level 5000 module in place of a Level 4000 module.~~

Level	Module Code/Title	Prerequisites	Requirements
3000	CM3291 Advanced Experiments in Inorganic and Organic Chemistry CM3292 Advanced Experiments in Analytical and Physical Chemistry	CM2191 Experiments in Chemistry 2 CM2192 Experiments in Chemistry 3	8 MCs Essential modules for Chemistry Major
3000/ 4000	CM3221 Organic Synthesis and Spectroscopy CM3225 Biomolecules	CM2121 CM2121	(1) 32 MCs of Level 3000 and 4000 CM (or specified non-CM) modules, excluding CM4199A, with at least four such modules at
	CM4271 Medicinal Chemistry CM4227 Chemical Biology	CM2121 and CM3225 CM2121 and CM3225	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>CM4273 Computational Drug Design
CM4274 The Art and Methodology in Total Synthesis
CM4215 Bioinorganic Chemistry

CM5224 Emerging Concepts of Drug Discovery[a]
CM5245 Bioanalytical Chemistry[a]
PR4205 Bioorganic Principles of Medicinal Chemistry</td><td>CM3221 or CM3222
CM2121

CM3211 or CM3212 or CM3268
By permission

By permission
PR3101</td><td>Level 4000[a]

(2) Specialization Requirement (24MC)
a) At least six modules or 24MC from (1) selected from:
CM3221, CM3225, CM4271, CM4227, CM4273, CM4274, CM4215, CM5224[a], CM5245[a] and PR4205</td></tr>
<tr><td></td><td>Other CM (or approved) modules</td><td></td></tr>
<tr><td>4000</td><td>CM4199A Honours Project in Chemistry (not in the area of Medicinal Chemistry)</td><td>Honours Eligibility Requirements for specific cohort</td><td>16 MCs</td></tr>
<tr><td colspan="3">Total</td><td>56 MCs</td></tr>
</table>
[a] Students may take up to one Level 5000 module in place of a Level 4000 module. This Level 5000 module cannot be used again to satisfy graduate studies requirement
</td><td></td></tr>
<tr><td>20.</td><td>11 February 2015</td><td>FoS</td><td>
http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf (Pg 334 - Minor in Nanoscience)

Minor in Nanoscience
Host Department: Chemistry and Physics
Nanoscience and nanotechnology encompass the ability to understand and manipulate matter at the molecular level, to create artificial structures at the nanoscale with potentially novel functions

Structures behave differently when their dimensions are reduced to the range of between one and one hundred nanometers (nm). Such structures exhibit novel and very much improved physical, chemical and biological properties, due entirely to their nanoscopic size. Once we can control feature sizes on the nanometer scale, it is possible to enhance material properties and device functions beyond those that we presently know or even consider possible. Nanotechnology is defined as the ability to work at the molecular level, atom by atom, to create large structures with fundamentally new molecular organisation. Nanoscience is an exciting new multidisciplinary realm that brings together the traditional disciplines of Physics, Chemistry and Biology.

The objective of the Nanoscience minor programme is to provide a comprehensive introduction to the field of nanoscience, and would be suitable not only for students in the sciences and engineering, but also for students from any discipline who show a keen interest in the latest
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			developments in science. This Nanoscience minor programme covers the latest research and technology trends which may soon revolutionise the world's economy. . This Minor would be particularly attractive to Physics, Chemistry and Engineering majors. To qualify for a Minor in Nanoscience, a student should pass six modules as follows: 1. Two compulsory Level-1000 modules: a. CM1131 Physical Chemistry or CM1502 General and Physical Chemistry for Engineers and b. PC1144 Physics IV or PC1432 Physics IIE 2. Two Level-2000 modules: a. SP2251 Science at the Nanoscale and b. CM2101 Physical Chemistry 2 or PC2130 Quantum Mechanics 1 3. Two Level-3000 modules: a. CM3251 Nanochemistry; or b. PC3251 Nanophysics; or c. CM/LSM/ PC3288[Advanced UROPS]* d. SP3277 Nano: from Research Bench to Industrial Applications** * Must be a Nanoscience-related project. ** SP3277 involves a compulsory nanotechnology study tour to Japan Note: Chemistry and Physics majors are only allowed to read at most three CM- and three PC- coded modules respectively; out of which only two modules (at most) are allowed to overlap with a student's major requirements.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
21.	11 Feb 2015	FoS	http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf **(Pg 224)**	

Requirements for Computational Biology Programme in the Faculty of Science
(For Students Matriculated in AY2013/14)

Changes are shown in blue.

To be awarded a B.Sc. or B.Sc.(Hons.) with a major in Computational Biology, candidates must satisfy the following:

PROGRAMME REQUIREMENTS		MCs
University Requirements		
2 x General Education Modules	8	**20**
1 x Singapore Studies Module	4	
2 x Breadth Elective Modules [2] CS1010S or CS1010FC Programming Methodology CS1020E or CS1020 Data Structures And Algorithms I	8	
Faculty Requirements		**16**
CM1401 Chemistry for Life Sciences [1] LSM1101 Biochemistry Of Biomolecules [1] MA2213 Numerical Analysis 1 FMS120*X*B Freshman Seminar *(x denotes the number of the seminar)* [1]		
Major Requirements		*36 - 40*
Level-1000 / 2000 Essential [1]		
CS1231 Discrete Structures or MA1100 Fundamental Concepts of Mathematics	4	
LSM1102 Molecular Genetics	4	
MA1101R Linear Algebra I	4	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates			Remarks
			MA1102R Calculus	4		
			PC1432 Physics IIE	4		
			CS2220 Introduction to Computational Biology [4]	4		
			LSM2101 Metabolism And Regulation **OR** LSM2102 Molecular Biology **OR** LSM2103 Cell Biology	4		
			~~LSM2201A Experimental Biochemistry **OR**~~ ~~LSM2202A Experimental Molecular And Cell Biology~~ LSM2191 Laboratory Techniques in Life Sciences	4		
			Either ST2334 Probability and Statistics **OR** a combined ST2131 Probability and ST2132 Mathematical Statistics*	4 - 8		
			Level-3000 Essential		**8**	
			MA3259 Mathematical Methods In Genomics	4		
			LSM3231 Protein Structure and Function	4		
			Level-3000 Electives [3] (Choose Four Modules) – **[Either Any two modules from option A and any two modules from option B or option C OR Any two modules from option A and one module each from option B and option C]** **Option A** CS2102 Database System CS3103 Computer Networks and Protocols CS3225 Combinatorial Methods in Bioinformatics CS3240 ~~Human-Computer Interaction~~ Interaction Design		**16**	

Bulletin Updates AY2013/14						
S/N	**Date**	**Faculty/ School/**	**Updates**			**Remarks**
				CS3241 Computer Graphics CS3243 ~~Foundation of Artificial Intelligence~~ Introduction to Artificial Intelligence CS3244 Machine Learning ~~and Neural Networks~~ **Option B** LSM3211 Fundamental Pharmacology ~~LSM3213 Molecular and Cellular Neurobiology~~ LSM3215 Neuronal Signaling and Memory Mechanisms LSM3223 Immunology LSM3232 Microbiology LSM3233 Developmental Biology LSM3241 Bioinformatics & Biocomputing LSM3243 Molecular Biophysics LSM3244 Molecular Biotechnology PC3267 Biophysics II **Option C** MA3233 ~~Algorithmic Graph Theory~~ Combinatorics and Graphs II PR3203 Computer Aided Drug Design and Development ST3131 Regression Analysis ST3240 Multivariate Statistical Analysis ST3232 Design and analysis of experiments ST3233 Applied time series analysis ST3236/MA3238 Stochastic Process 1 ST3243 Statistical methods in epidemiology ST3245 Statistics in molecular biology ST3247 Simulation			
				Level-4000 Essential	**20**		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates			Remarks
			ZB4199 Honours Project in Computational Biology	12		
			ZB4171 Advanced Topics in Bioinformatics	4		
			LSM4241 Functional Genomics	4		
			Level-4000 Electives (Choose <u>THREE</u> Modules) – **[Any two modules from either option A or option B or option C, and the remaining third module to be selected from the Option not chosen]** **<u>Option A</u>** CS4220 Knowledge Discovery Methods in Bioinformatics CS4221 Database Design CS4231 Parallel and Distributed Algorithms CS4237 Systems Modelling and Simulations CS4243 Computer Vision and Pattern Recognition CS4244 Knowledge-Based Systems CS4248 Natural Language Processing **<u>Option B</u>** LSM4211 Toxicology LSM4212 Pharmacogenetics and Drug Response LSM4213 Systems Neurobiology LSM4221 Drug discovery and Clinical Trials LSM4222 Advanced Immunology LSM4224 Free Radicals and Antioxidant Biology LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4242 Protein Engineering		**12**	
			<u>Option C</u> MA4251/ST4238 Stochastic Processes II			

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			PC4267 Biophysics III ST4231 Computer intensive statistical methods ST4234 Bayesian Statistics ~~ST4235 Simulation~~ ST4240 Data Mining ST4241 Design & Analysis Of Clinical Trials ST4242 Analysis of Longitudinal Data ST4243 Statistical Methods for DNA Microarray Analysis	
			Unrestricted Elective Modules [4] **28-32** **TOTAL** **160**	
			[1] Modules are part of the lower division requirements for the Computational Biology Programme. [2] Science students will read CS1010S Programming Methodology (4 MCs) and CS1020E Data Structures and Algorithms I (4 MCs) in fulfilment of their Breadth Requirements. [3] ZB3288 UROPS in Computational Biology can be taken in fulfilment of 4MCs from any of the options in the level-3000 elective list. [4] Students may wish to read PC2267 Biophysics I as an unrestricted elective module to meet the prerequisites required for PC3267 Biophysics II (Level-3000 major elective module). Student without computing background may wish to read LSM2241 as a preparatory course before reading CS2220. * Students should choose the combined ST2131 and ST2132 in place of ST2334 if they plan to pursue higher ST modules. ST2131 is a pre-requisite to ST2132.	
22.	19 Mar 2015	FoS	CELC proposed a new module –ES1000FC and it was approved via BUS Circular 13, AY2014/15 dated 12 Feb 2018. ES1000FC is the flipped classroom version of ES1000. FoS informed that they understand from CELC that old cohorts of students who have yet to read ES1000 will be asked to read ES1000FC when it is offered starting Sem 1 AY15/16. Hence, to indicate as ES1000/ES1000FC where ES1000 is mentioned under section **'English Skills Requirements'** at http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf (Pg 162) The amendments are indicated in red below:	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>‘Based on the Qualifying English Test results, students who do not meet exemption criteria have to take and pass ES1102 English for Academic Purposes. In addition, very weak students have to take and pass ES1000/ES1000FC Basic English Course before proceeding to ES1102.

ES1000/ES1000FC and ES1102 are not counted towards Modular Credits and CAP. However, they are counted as part of the workload for every semester. (Please refer to section 3.3.2)

Students who need to clear ES requirement for graduation must do so by their fourth semester at the latest.</td><td></td></tr>
<tr><td>23.</td><td>1 Apr 2015</td><td>BIZ</td><td>Replace the ‘Degree and Honours Classification’ table at http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoB.pdf (Pg 75) with the revised one reflected (in red) below:

<table>
<tr><th>Honours Degree Classification</th><th>Criteria</th></tr>
<tr><td>Honours

(Highest Distinction)</td><td>4.50 and above</td></tr>
<tr><td>Honours (Distinction)</td><td>4.00 - 4.49</td></tr>
<tr><td>Honours (Merit)</td><td>3.50 - 3.99</td></tr>
<tr><td>Honours</td><td>3.00 - 3.49</td></tr>
<tr><td>Pass</td><td>2.00 - 2.99</td></tr>
<tr><th>Bachelor's Degree Classification</th><th>Criteria</th></tr>
<tr><td>Pass with Merit</td><td>3.00 and Above</td></tr>
<tr><td>Pass</td><td>2.00 - 2.99</td></tr>
<tr><td>Fail</td><td>Below 2.00</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th colspan="5">Bulletin Updates AY2013/14</th></tr>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td>24.</td><td>7 Apr 2015</td><td>FoS</td><td>2013/14 Bulletin – under section 3.3.1.6 - Faculty Requirements at

http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf (Pg 159)

• Remove Table 3: Provisions for students in Special Programmes and replace with the portion highlighted in red below:

Table 3: Provisions for students in Special Programmes

<table>
<tr><th>Programme</th><th>Provision for SPS/USP students</th></tr>
<tr><td>Special Programme in Science (SPS)</td><td>Students in the B.Sc. (resp. B.Sc. (Hons.)) Programme who have passed three (resp. four) of the six SPS Programme modules, namely SP2171, SP2173, SP2174, SP3172, SP3175 and SP3176, are deemed to have completed 12 MCs (resp. 16 MCs) of the Faculty Requirement from 3 distinct subject groups outside the group under which their major falls.

Students in the B.Sc. Programme who have passed two or fewer of the SPS Programme modules are required to read modules from any subject group outside the group(s) under which the major falls, to make up 12 MCs.

Students in the B.Sc. (Hons.) Programme who have passed three or fewer of the SPS Programme modules are required to read modules from any subject group outside the group(s) under which the major falls, to make up 16 MCs. Up to one of these modules read may come from the subject group under which the major falls, but not bearing the prefix of the major.

Students who may have part of their Faculty Requirements fulfilled by modules within their majors can use the remaining MCs as Unrestricted Electives.</td></tr>
</table>

Note: SP2171 is a module that spans two semesters. Students who withdraw from the Programme while still reading</td><td></td></tr>
</table>

<table>
<tr><th colspan="5">Bulletin Updates AY2013/14</th></tr>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>SP2171 will not be allowed to continue enrolling in SP2171.

• Remove the following text:
<s>* CBMs = USP Course-based Modules; UMSs = USP Advanced Multidisciplinary Seminars</s></td><td></td></tr>
<tr><td>25.</td><td>11 Jun 2015</td><td>FoS</td><td><u>Background</u>:
BUS Circular 21 of AY14/15 has approved the new module PC4236 Computational Condensed Matter Physics for Physics major students. Therefore, we need to update the 2012, 2013 and 2014 Bulletin to reflect this module in their curriculum.

Amendments to make:

<u>2013 Bulletin</u>

Under 3.3.3.5 i.e. Bachelor of Science/Bachelor of Science (Hons) Programme requirements for Physics (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf, Pg 239)

<u>Changed from:</u>
Current Requirements under Graduation Requirements
Under Level 4000 electives:

<table><tr><td>Level-4000 (30-32 MCs)</td><td>Pass
PC4199 Honours Project in Physics
PC4130 Quantum Mechanics III
And any four modules from the following electives:
- PC4232 Cosmology
- PC4240 Solid State Physics II
- PC4241 Statistical Mechanics
- PC4242 Electrodynamics
- PC4243 Atomic and Molecular Physics II
- PC4245 Particle Physics
- PC4246 Quantum Optics</td><td>95 – 96</td></tr></table></td><td></td></tr>
</table>

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			- PC4248 Relativity - PC4253 Thin Film Technology - PC4259 Surface Physics - PC4262 Remote Sensing - PC4264 Advanced Solid State Devices - PC4265 Techniques for Computerised Experiments - PC4267 Biophysics III - PC4268 Biophysical Instrumentation and Biomolecular Electronics - PC4274 Mathematical Methods in Physics III - EE4401 Optoelectronics - EE4413 Low-dimensional Electronic Devices - MLE4201 Advanced Materials Characterisation - MLE4204 Synthesis and Growth of Nanostructures - MLE4205 Theory and Modelling of Materials Properties - an approved module offered by other Departments	

To:

Revised Requirements under Graduation Requirements

The following are the amendments required-

1) Please insert PC4236 Computational Condensed Matter Physics in the level 4000 section in the table above, after PC4232 Cosmology, followed by PC4240 Solid State Physics II.

Bulletin Updates AY2013/14								
S/N	**Date**	**Faculty/ School/**	**Updates**					**Remarks**
				Level-4000 (30-32 MCs)	Pass PC4199 Honours Project in Physics PC4130 Quantum Mechanics III And any four modules from the following electives: - PC4232 Cosmology - PC4236 Computational Condensed Matter Physics - PC4240 Solid State Physics II - PC4241 Statistical Mechanics - PC4242 Electrodynamics - PC4243 Atomic and Molecular Physics II - PC4245 Particle Physics - PC4246 Quantum Optics - PC4248 Relativity - PC4253 Thin Film Technology - PC4259 Surface Physics - PC4262 Remote Sensing - PC4264 Advanced Solid State Devices - PC4265 Techniques for Computerised Experiments - PC4267 Biophysics III - PC4268 Biophysical Instrumentation and Biomolecular Electronics - PC4274 Mathematical Methods in Physics III - EE4401 Optoelectronics - EE4413 Low-dimensional Electronic Devices - MLE4201 Advanced Materials Characterisation - MLE4204 Synthesis and Growth of Nanostructures - MLE4205 Theory and Modelling of Materials	95 – 96		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			Properties - an approved module offered by other Departments	
26.	11 June 2015	FoS	**Background:** 1) BUS meeting 10 of AY14/15 has approved several structural changes to the Life Sciences curriculum for Cohort 2012 and after. Hence we need to make necessary updates to the 2012, 2013 and 2014 Bulletin. 2) BUS Circular 20 of AY14/15 has approved the new module LSM3246 Synthetic Biology for Life Sciences major students. Therefore, we need to update the 2013 and 2014 Bulletin to reflect this module in their curriculum. **Amendments to make are in yellow highlight.** **2013 Bulletin** Under 3.3.3.3 i.e. Bachelor of Science/Bachelor of Science (Hons) Programme requirements for Life Sciences, (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf). **Changed from:**	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Current 2013 Requirements in Bulletin:

Graduation Requirements

To be awarded a B.Sc. with a primary major in Life Sciences, candidates must satisfy the following:

Level	Life Sciences Major Requirements		Cumulative Major MCs
Level 1000 (24 MCs)	Pass LSM1101 Biochemistry of Biomolecules LSM1102 Molecular Genetics LSM1103 Biodiversity LSM1104 General Physiology CM1401 Chemistry for Life Sciences ST1232 Statistics for Life Sciences	Broad Based Curriculum	24
Level 2000 (20 MCs)	Pass LSM2101 Metabolism and Regulation LSM2102 Molecular Biology LSM2103 Cell Biology		44
	Pass one LSM2201A Experimental Biochemistry LSM2202A Experimental Molecular and Cell Biology LSM2203 Experimental Microbiology		

Bulletin Updates AY2013/14								
S/N	**Date**	**Faculty/ School/**	**Updates**					**Remarks**
				Pass one LSM2241 Introductory Bioinformatics LSM2251 Ecology and Environment				
				Pass 5 LSM32XX from any area of focus or Life Sciences Related Modules, out of which at least 3 have to be from one chosen area of focus (BMS/MCB/EVB) [LSM42XX modules from chosen area may be taken to replace up to 8 MCs of these five modules.]				
			Level 3000 (20 MC)	LSM3211 Fundamental Pharmacology LSM3212 Human Physiology – Cardiopulmonary System LSM3213 Molecular and Cellular Neurobiology LSM3214 Human Physiology – Hormones and Health LSM3221 Human Pharmacology LSM3223 Immunology LSM3224 Molecular Basis of Human Diseases LSM3225 Molecular Microbiology in Human Diseases	Biomedical Science (BMS)	64		

Bulletin Updates AY2013/14									
S/N	**Date**	**Faculty/ School/**	**Updates**						**Remarks**
					LSM3231 Protein Structure and Function LSM3232 Microbiology LSM3233 Developmental Biology LSM3241 Bioinformatics and Biocomputing LSM3242 Applied Microbiology LSM3243 Molecular Biophysics LSM3244 Molecular Biotechnology LSM3245 RNA Biology and Technology	Molecular and Cell Biology (MCB)			
					LSM3252 Evolution and Comparative Genomics LSM3253 Plant Physiology LSM3254 Ecology of Aquatic Environments LSM3255 Ecology of Terrestrial Environments LSM3261 Life Form and Function LSM3262 Environmental Animal Physiology LSM3263 Field Studies in Neotropical Ecosystems LSM3264 Environmental Biochemistry LSM3265 Entomology LSM3272 Global Change Biology	Environmental Biology (EVB)			

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

	BN3301 Introduction to Biomaterials BN3402 Bio-Analytical Methods in Bioengineering FST3102 Food Safety Assurance FST3203 Vitamins & Minerals in Health & Diseases	Life Sciences Related Modules	
	4 MCs read for Level 3000 UROPS LSM3288/9 can satisfy 1 of the Level 3000 modules needed for major requirement, fulfilling either a module inside or outside chosen area of focus.		

To be awarded a B.Sc. (Hons.) with a primary major in Life Sciences (with specialisation in Biomedical Science, Molecular and Cell Biology or Environmental Biology), candidates must satisfy the following:

Level	Life Sciences Major Requirements		Cumulative Major MCs
Level 1000 (24 MCs)	Pass LSM1101 Biochemistry of Biomolecules LSM1102 Molecular Genetics LSM1103 Biodiversity LSM1104 General Physiology CM1401 Chemistry for Life Sciences ST1232 Statistics for Life Sciences	Broad Based Curriculum	24

Bulletin Updates AY2013/14									
S/N	**Date**	**Faculty/ School/**	**Updates**						**Remarks**
				Level 2000 (20 MCs)	Pass LSM2101 Metabolism and Regulation LSM2102 Molecular Biology LSM2103 Cell Biology		44		
					Pass one LSM2201A Experimental Biochemistry LSM2202A Experimental Molecular and Cell Biology LSM2203 Experimental Microbiology				
					Pass one LSM2241 Introductory Bioinformatics LSM2251 Ecology and Environment				
					Pass 5 LSM32XX from any area of focus or Life Sciences Related Modules, out of which at least 3 have to be from one chosen area of focus (BMS/MCB/EVB) [LSM42XX modules from chosen area may be taken to replace up to 8 MCs of these five modules.]				

Bulletin Updates AY2013/14									
S/N	**Date**	**Faculty/ School/**	**Updates**						**Remarks**
				Level 3000 (20 MC)	LSM3211 Fundamental Pharmacology LSM3212 Human Physiology – Cardiopulmonary System LSM3213 Molecular and Cellular Neurobiology LSM3214 Human Physiology – Hormones and Health LSM3221 Human Pharmacology LSM3223 Immunology LSM3224 Molecular Basis of Human Diseases LSM3225 Molecular Microbiology in Human Diseases	Biomedical Science (BMS)	64		
					LSM3231 Protein Structure and Function LSM3232 Microbiology LSM3233 Developmental Biology LSM3241 Bioinformatics and Biocomputing LSM3242 Applied Microbiology LSM3243 Molecular Biophysics LSM3244 Molecular Biotechnology LSM3245 RNA Biology and Technology	Molecular and Cell Biology (MCB)			

Bulletin Updates AY2013/14									
S/N	**Date**	**Faculty/ School/**	**Updates**						**Remarks**
					LSM3252 Evolution and Comparative Genomics LSM3253 Plant Physiology LSM3254 Ecology of Aquatic Environments LSM3255 Ecology of Terrestrial Environments LSM3261 Life Form and Function LSM3262 Environmental Animal Physiology LSM3263 Field Studies in Neotropical Ecosystems LSM3264 Environmental Biochemistry LSM3265 Entomology LSM3272 Global Change Biology	Environmental Biology (EVB)			
					BN3301 Introduction to Biomaterials BN3402 Bio-Analytical Methods in Bioengineering FST3102 Food Safety Assurance FST3203 Vitamins & Minerals in Health & Diseases	Life Sciences Related Modules			
					4 MCs read for Level 3000 UROPS LSM3288/9 can satisfy 1 of the Level 3000 modules needed for major requirement, fulfilling either a module inside or outside chosen area of focus.				

Bulletin Updates AY2013/14									
S/N	**Date**	**Faculty/ School/**	**Updates**						**Remarks**
				Level 4000 (36 MCs)	Pass LSM4199 Honours Project in Life Sciences Pass 5 LSM42XXs from any area of focus or Life Sciences Related Modules, out of which at least 3 have to be from chosen specialisation (BMS/MCB/EVB).		100		
					LSM4211 Toxicology LSM4212 Pharmacogenetics and Drug Responses LSM4213 System Neurobiology LSM4214 Cancer Pharmacology LSM4221 Drug Discovery and Clinical Trials LSM4222 Advanced Immunology LSM4223 Advances in Antimicrobial Strategies LSM4224 Free Radicals and Antioxidant Biology LSM4225 Genetic Medicine in the Post-Genomic Era LSM4226 Infection and Immunity LSM4227 Stem Cell Biology	Biomedical Science (BMS)			

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4234 Mechanobiology LSM4241 Functional Genomics LSM4242 Protein Engineering LSM4243 Tumour Biology LSM4244 Oncogenes and Signal Transduction LSM4245 Epigenetics and Chromatin Biology LSM4251 Plant Growth and Development LSM4252 Animal Reproduction — Molecular and Cell Biology (MCB) LSM4253 Behavioural Biology LSM4254 Principles of Taxonomy and Systematics LSM4261 Marine Biology LSM4262 Tropical Conservation Biology LSM4263 Field Studies in Biodiversity LSM4264 Freshwater Biology LSM4265 Urban Ecology LSM4266 Topics in Aquatic Biodiversity — Environmental Biology (EVB) BN4301 Principles of Tissue Engineering BN4403 Cellular Bioengineering — Life Sciences Related Modules **To:** **2013 Revised Requirements:**	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			The following are the amendments required (from Pg 228 to 231- Graduation requirements tables for B.Sc and B.Sc (hons)) 1) The curriculum structure has changed. Please remove the original one listed above, and use the one below, which also included the following updates a) Inserting LSM3246 Synthetic Biology, in the level 3000 section in the tables below, after LSM3245 RNA Biology and Technology, followed by LSM3252 Evolution and Comparative Genomics. (refer to yellow highlight for the changes). b) Structural changes to the Level 3 and 4 requirements	

Graduation Requirements

To be awarded a B.Sc. with a primary major in Life Sciences, candidates must satisfy the following:

Level	Life Sciences Major Requirements	Cumulative Major MCs
Level 1000 (24 MCs)	Pass all LSM1101 Biochemistry of Biomolecules LSM1102 Molecular Genetics LSM1103 Biodiversity LSM1104 General Physiology CM1401 Chemistry for Life Sciences ST1232 Statistics for Life Sciences	24

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			<table><tr><td>Level 2000 (20 MCs)</td><td>Pass all LSM2101 Metabolism and Regulation LSM2102 Molecular Biology LSM2103 Cell Biology LSM2191 Laboratory Techniques in Life Sciences Pass one LSM2241 Introductory Bioinformatics LSM2251 Ecology and Environment LSM2291 Fundamental Techniques in Microbiology</td><td>44</td></tr></table>	
			<table><tr><th>Level</th><th>Life Sciences Major Requirements</th><th>Cumulative Major MCs</th></tr><tr><td>Level 3000 (20 MCs)</td><td>Pass 5 LSM32XX elective modules (except LSM3289), one of which may be a LSM-recognised elective module (up to 4MCs).</td><td></td></tr></table>	

Bulletin Updates AY2013/14								
S/N	Date	Faculty/ School/		Updates				Remarks
					LSM3201 Research and Communication in Life Sciences LSM3211 Fundamental Pharmacology LSM3212 Human Physiology – Cardiopulmonary System LSM3214 Human Physiology – Hormones and Health LSM3215 Neuronal Signaling and Memory Mechanisms LSM3216 Neuronal Development and Diseases LSM3217 Human Ageing LSM3221 Human Pharmacology LSM3223 Immunology LSM3224 Molecular Basis of Human Diseases LSM3225 Molecular Microbiology in Human Diseases LSM3231 Protein Structure and Function LSM3232 Microbiology LSM3233 Developmental Biology LSM3241 Bioinformatics and Biocomputing LSM3242 Applied Microbiology	64		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Level	Life Sciences Major Requirements	Cumulative Major MCs
	LSM3243 Molecular Biophysics LSM3244 Molecular Biotechnology LSM3245 RNA Biology and Technology LSM3246 Synthetic Biology LSM3252 Evolution and Comparative Genomics LSM3253 Plant Physiology LSM3254 Ecology of Aquatic Environments LSM3255 Ecology of Terrestrial Environments LSM3256 Tropical Horticulture LSM3257 Quantitative Methods for Ecological Research LSM3261 Life Form and Function LSM3262 Environmental Animal Physiology LSM3263 Field Studies in Neotropical Ecosystems LSM3264 Environmental Biochemistry LSM3265 Entomology LSM3266 Avian Biology and Evolution LSM3267 Behavioural Biology	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Level	Life Sciences Major Requirements	Cumulative Major MCs
	LSM3272 Global Change Bilogy LSM3288 Advanced UROPS in Life Sciences I	

To be awarded a B.Sc. (Hons.) with a primary major in Life Sciences (with specialisation in Biomedical Science, Molecular and Cell Biology or Environmental Biology), candidates must satisfy the following:

Level	**Life Sciences Major Requirements**	**Cumulative Major MCs**
Level 1000 (24 MCs)	Pass all LSM1101 Biochemistry of Biomolecules LSM1102 Molecular Genetics LSM1103 Biodiversity LSM1104 General Physiology CM1401 Chemistry for Life Sciences ST1232 Statistics for Life Sciences	24

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			Level 2000 (20 MCs)	Pass all LSM2101 Metabolism and Regulation LSM2102 Molecular Biology LSM2103 Cell Biology LSM2191 Laboratory Techniques in Life Sciences Pass one LSM2241 Introductory Bioinformatics LSM2251 Ecology and Environment LSM2291 Fundamental Techniques in Microbiology	44
			Level 3000 (20 MCs)	Pass 5 LSM32XX elective modules (except LSM3289), one of which may be a LSM-recognised elective module (up to 4 MCs)	64

Bulletin Updates AY2013/14								
S/N	**Date**	**Faculty/ School/**	**Updates**					**Remarks**
				LSM3201 Research and Communication in Life Sciences LSM3211 Fundamental Pharmacology LSM3212 Human Physiology – Cardiopulmonary System LSM3213 Molecular and Cellular Neurobiology LSM3214 Human Physiology – Hormones and Health LSM3215 Neuronal Signaling and Memory Mechanisms LSM3216 Neuronal Development and Diseases LSM3217 Human Ageing LSM3221 Human Pharmacology LSM3223 Immunology LSM3224 Molecular Basis of Human Diseases LSM3225 Molecular Microbiology in Human Diseases LSM3231 Protein Structure and Function LSM3232 Microbiology LSM3233 Developmental Biology LSM3241 Bioinformatics and Biocomputing LSM3242 Applied Microbiology LSM3243 Molecular Biophysics LSM3244 Molecular Biotechnology LSM3245 RNA Biology and Technology LSM3246 Synthetic Biology LSM3252 Evolution and Comparative Genomics LSM3253 Plant Physiology LSM3254 Ecology of Aquatic Environments LSM3255 Ecology of Terrestrial			

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Level	Life Sciences Major Requirements	Cumulative Major MCs
	Environments LSM3256 Tropical Horticulture LSM3257 Quantitative Methods for Ecological Research LSM3261 Life Form and Function LSM3262 Environmental Animal Physiology LSM3263 Field Studies in Neotropical Ecosystems LSM3264 Environmental Biochemistry LSM3265 Entomology LSM3266 Avian Biology and Evolution LSM3267 Behavioural Biology LSM3272 Global Change Biology LSM3288 Advanced UROPS in Life Sciences I	
Level 4000 (32 MCs)	Pass ~~LSM4199 Honours Project in Life Sciences (project to be listed in area of chosens pecialisation)~~ ~~Pass 4 LSM42XX elective modules, out of which at least 2 have to be from chosen specialisation (BMS/MCB/EVB).~~ Pass the Honours Year project LSM4199, and 4 LSM42XX elective modules. To be conferred one of the 3 specialisations (BMS/MCB/EVB), LSM4199 and at least 2 of the 4 LSM42XX elective modules have to be listed with chosen specialisation.	96

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Level	Life Sciences Major Requirements		Cumulative Major MCs
	LSM4211 Toxicology LSM4212 Pharmacogenetics and Drug Responses LSM4213 System Neurobiology LSM4214 Cancer Pharmacology LSM4215 Extreme	Biomedical Science (BMS)	
	Physiology LSM4221 Drug Discovery and Clinical Trials LSM4222 Advanced Immunology LSM4223 Advances in Antimicrobial Strategies LSM4225 Genetic Medicine in the Post-Genomic Era LSM4226 Infection and Immunity LSM4227 Stem Cell Biology		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates				Remarks
				LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4234 Mechanobiology LSM4241 Functional Genomics LSM4242 Protein Engineering LSM4243 Tumour Biology LSM4244 Oncogenes and Signal Transduction LSM4245 Epigenetics and Chromatin Biology LSM4251 Plant Growth and Development LSM4252 Animal Reproduction	Molecular and Cell Biology (MCB)		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Level	Life Sciences Major Requirements		Cumulative Major MCs
	LSM4254 Principles of Taxonomy and Systematics LSM4255 Methods in Mathematical Biology LSM4261 Marine Biology LSM4262 Tropical Conservation Biology LSM4263 Field Studies in Biodiversity LSM4264 Freshwater Biology LSM4265 Urban Ecology LSM4266 Topics in Aquatic Biodiversity LSM4267 Animal Communications & Sensory Ecology	Environmental Biology (EVB)	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
27.	18 Jun 2015	FoS	**Background**: BUS has approved some changes to the Computational Biology requirements via BUS circular 24 of AY14/15 as follows: [1) To include new module CS4234 Optimisation Algorithms, to be mounted starting from AY 2015/16, as one of the Level-4000 electives in Option A for cohorts from AY2013/14 onwards. 2) To include CS3230 Design and Analysis of Algorithms to Option A of the Level-3000 electives for cohorts from AY2013/14 onwards. 3) To update the module titles for CS3103 and CS4221 in the major requirements for cohorts from AY2012/13 onwards.] **2013 Online Bulletin** **Under 3.3.3.2 i.e. Bachelor of Science (Hons) programme requirements for Computational Biology (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf)** **In pg 225:**	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			Level-3000 Electives [3] (Choose Four Modules) – [Either Any two modules from option A and any two modules from option B or option C OR Any two modules from option A and one module each from option B and option C] Option A CS2102 Database System CS3103 ~~Computer Networks and Protocols~~ Computer Networks Practice CS3225 Combinatorial Methods in Bioinformatics CS3230 Design and Analysis of Algorithms CS3240 Human-Computer Interaction CS3241 Computer Graphics CS3243 Foundation of Artificial Intelligence CS3244 Machine Learning and Neural Networks Option B LSM3211 Fundamental Pharmacology LSM3213 Molecular and Cellular Neurobiology LSM3223 Immunology LSM3232 Microbiology LSM3233 Developmental Biology LSM3241 Bioinformatics & Biocomputing LSM3243 Molecular Biophysics LSM3244 Molecular Biotechnology PC3267 Biophysics II Option C MA3233 Algorithmic Graph Theory PR3203 Computer Aided Drug Design and Development ST3131 Regression Analysis ST3240 Multivariate Statistical Analysis ST3232 Design and analysis of experiments ST3233 Applied time series analysis ST3236 / MA3238 Stochastic Process 1	16	
			ZB4171 Advanced Topics in Bioinformatics — 4		
			LSM4241 Functional Genomics — 4		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			Level-4000 Electives (Choose Three Modules) – [Any two modules from either option A or option B or option C, and the remaining third module to be selected from the Option not chosen] Option A CS4220 Knowledge Discovery Methods in Bioinformatics CS4221 ~~Database Design~~ Database Applications Design and Tuning CS4231 Parallel and Distributed Algorithms CS4234 Optimisation Algorithms CS4237 Systems Modelling and Simulations CS4243 Computer Vision and Pattern Recognition CS4244 Knowledge-Based Systems CS4248 Natural Language Processing Option B LSM4211 Toxicology LSM4212 Pharmacogenetics and Drug Response LSM4213 Systems Neurobiology LSM4221 Drug discovery and Clinical Trials LSM4222 Advanced Immunology LSM4224 Free Radicals and Antioxidant Biology LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4242 Protein Engineering Option C MA4251/ ST4238 Stochastic Processes II 12	
28.	30 Jun 2015	BIZ	**Update #1 – Curriculum Structure and Requirements for BBA and BBA (Hons.) for AY2013/2014 and AY2014/2015** **http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoB.pdf - Pg 53** **Table 5 Elective Specialisation Modules (To update the list of modules in the bulletin with the list below.)** **Table 5: Elective Specialisation Modules** **Module Code** / **Module Title** **(A) Finance -** Any new level 3000/4000 modules with FINxxxx code that are not listed below can also count towards the Finance specialisation. However, do note that the Honours Dissertation replacement modules cannot be used towards the fulfillment of a specialization requirements.	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates		Remarks
			FIN3113	Financial Statement Analysis	
			FIN3115	International Financial Management	
			FIN3116	Options and Futures	
			FIN3117	Bank Management	
			FIN3118	Financial Risk Management	
			FIN3119	Risk and Insurance	
			*FIN3120	Topics in Finance	
			FIN3120B	Topics in Finance: Transaction Banking	
			FIN3120C	Topics in Finance: China’s Capital Markets	
			FIN3120D	Topics in Finance: Foreign Exchange Trading	
			FIN3120E	Topics in Finance: Physical Commodity Markets and Assets	
			FIN3129	Independent Study Module in Finance	
			FIN3130	Financial Modelling	
			FIN3131	Fixed Income Securities	
			FIN3132	Value Investing in Asia	
			*FIN3139	Independent Study Module in Finance	
			FIN4111	Research Methods in Finance	
			*FIN4112	Seminars in Finance	
			FIN4112G	Seminars in Finance: Private Equity	
			FIN4112H	Seminars in Finance: Investment Banking	
			FIN4112K	Seminars in Finance: Applied Portfolio Management	
			FIN4112L	Seminars in Finance: Corporate Governance & Financial Policy	
			FIN4113	Personal Finance & Wealth Management	
			FIN4114	Private Equity and Investment Banking	
			FIN4119	Advanced Independent Study Module in Finance	
			FIN4120	Equity Research Seminar 1	
			FIN4121	Equity Research Seminar 2	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			*FIN4129 — Advanced Independent Study Module in Finance **(B) Operations and Supply Chain Management** - Any new level 3000/4000 modules with DSCxxxx code that are not listed below can also count towards the Operations and Supply Chain Management specialisation. However, do note that the Honours Dissertation replacement modules cannot be used towards the fulfillment of a specialization requirements. DSC3213 — Strategic Information Systems DSC3214 — Introduction to Optimisation DSC3215 — Stochastic Models in Management DSC3216 — Forecasting for Managerial Decisions *DSC3222 — Topics in Operations and Supply Chain Management DSC3223 — Operations Strategy DSC3224 — Dynamic Pricing & Revenue Management DSC3226 — Sustainable Operations Management DSC3229 — Independent Study Module in Operations and Supply Chain Management *DSC3239 — Independent Study Module in Operations and Supply Chain Management *DSC4211 — Seminars in Operations and Supply Chain Management DSC4211G — Seminars in Operations and Supply Chain Management: Service Design DSC4212 — Managerial Decision Analysis DSC4213 — Analytical Tools for Consulting DSC4214 — Co-ordination and Flexibility in SCM DSC4219 — Advanced Independent Study Module in Operations and Supply Chain Management *DSC4229 — Advanced Independent Study Module in Operations and Supply Chain Management **(C) Management and Human Capital** - Any new level 3000/4000 modules with MNOxxxx code that are not listed below can also count towards the Management and Human Capital specialisation. However, do note that the Honours Dissertation replacement modules cannot be used towards the fulfillment of a specialization requirements. *MNO3313 — Topics in Management and Human Capital MNO3313J — Employee and organisational Misbehaviours MNO3313K — Topics in Management: Managing China Venture	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			MNO3317 Advanced Leadership MNO3318 Creativity and Innovation Management MNO3319 Power and Influence in Organisations MNO3320 Managing Change MNO3321 Training and Development MNO3322 Negotiation and Bargaining MNO3323 Management of Employee Relations MNO3329 Independent Study Module in Management & Human Capital MNO3330 Social Entrepreneurship MNO3331 Business With a Social Conscience *MNO3339 Independent Study Module in Management & Human Capital *MNO4313 Seminars in Management & Human Capital MNO4313B Culture and Management in Asia MNO4313C Seminars in Management & Human Capital: Compensation and Performance Management MNO4313D Seminars in Management & Human Capital: Corporate Entrepreneurship & Business Model Evaluation MNO4313E Seminars in Management & Human Capital: Managerial & Organisational Cognition MNO4313F Seminars in Management & Human Capital: Job Attitudes MNO4314 Consulting to Management MNO4315 Global Management of Asian Multinationals MNO4316 Experiencing Work: Effects on Behaviour and Well Being MNO4319 Advanced Independent Study Module in Management & Human Capital *MNO4329 Advanced Independent Study Module in Management & Human Capital **(D) Marketing** - Any new level 3000/4000 modules with MKTxxxx code that are not listed below can also count towards the Marketing specialisation. However, do note that the Honours Dissertation replacement modules cannot be used towards the fulfillment of a specialization requirements. MKT2411 Retail Management MKT2412 Global Marketing	

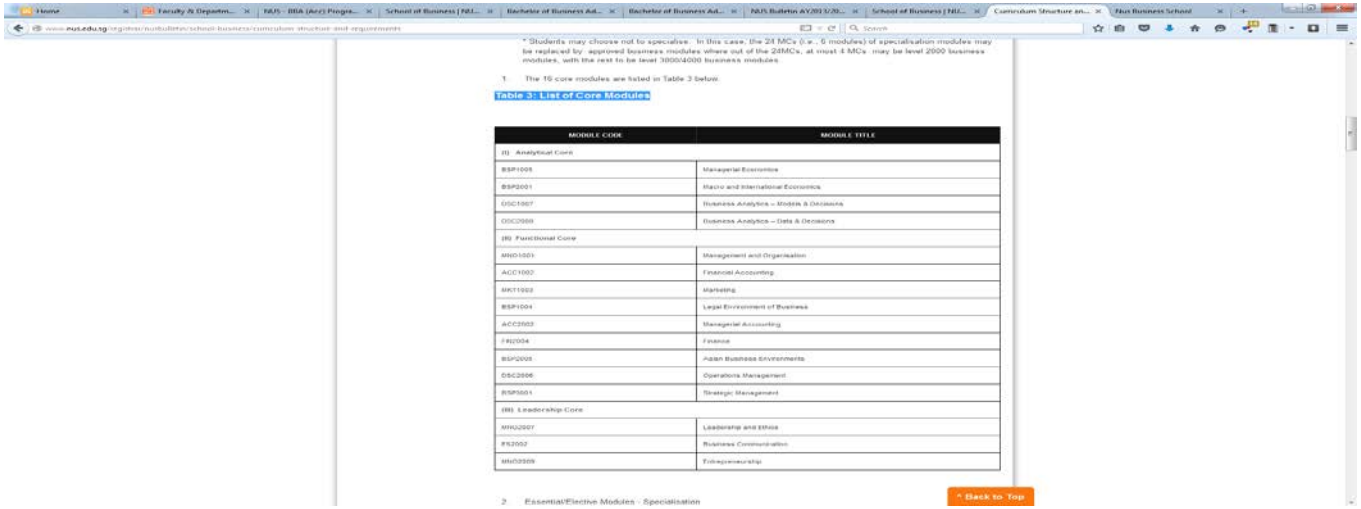
Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			MKT2413 Marketing Research MKT3412 Services Marketing MKT3413 SME Marketing Strategy MKT3415 Marketing in a Digital Age MKT3416 Business-To-Business Marketing MKT3417 Customer Asset Management MKT3418 Product and Brand Management MKT3420 Promotional Management MKT3421 Marketing Analysis and Decision Making *MKT3422 Topics in Marketing MKT3423 Consumer Culture Theory MKT3424 Branding Strategy MK3429 Independent Study Module in Marketing MKT3513 Game Theory and Strategic Analysis MKT4411 Marketing Strategy MKT4412 Marketing Theory and Research MKT4413 Pricing Models and Strategy *MKT4415 Seminars in Marketing MKT4415C Seminars in Marketing: Marketing Analytics MKT4416 Marketing Strategy Simulation & Case Analysis MKT4419 Advanced Independent Study Module in Marketing **(E) Others (Non Specialisation Business Elective Modules)** *BIS3001 Independent Study in Business *BLD3001 Business Leadership Case Analysis *BLD3002 CEOs as Leaders *BLD3003 Personal Leadership Development *BLD3004 Topics in Leadership	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			BSP3511 Corporate Law and Finance BSP3513 Family Business BSP4512 Global Strategic Management BSP4513 Econometrics: Theory and Practical Business Application BSP4515 Managing Social Networks in Markets and Organisations BSS4003A Special Seminar in Business: Innovation and Productivity MNO2312 Interpersonal Relations & Effectiveness TR2201 Entrepreneurial Marketing TR2202 Technological Innovation TR3001 New Product Development TR3002 New Venture Creation **TR3003 Global Entrepreneurial Marketing **TR3004 Engineering Entrepreneurship I **TR3005 Engineering Entrepreneurship II **TR3006 High-Tech Product and Market Development **TR3007 Entrepreneurial Finance **TR3008 Technology Entrepreneurship **TR3010 Ideation **TR3011 Planning - Developing a Venture **TR3101 Internship Continuous Assessment **TR3102 Internship Program Report **TR3103 Start-up Business Case **TR4002 Global Entrepreneurial Leadership **TR4202 From Science to Business - Concepts in Biotechnology **TR4203 Business Opportunities in ICT # The list of modules is non-exhaustive and subjected to changes as new modules can be added every semester and some modules may not be offered anymore due to irrelevance or restriction of resources. Students should refer to http://bba.nus.edu/online.html for modules to be offered for the semester	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			* Depending on the specific topics/seminars offered, the module may be worth 1, 2, 3 or 4 MCs. ** TR are NOC modules. Core, essential and elective specialisation modules are worth four Modular Credits each, unless otherwise stated. Additional elective modules of one, two or three Modular Credits may be introduced as and when necessary. **Update #2 – Item 3. Honours Dissertation for AY2013/2014 and 2014/2015 Bulletin** **http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoB.pdf - Pg 56** **Delete:** (The Honours Dissertation requirement may be met by 12 MCs of level 4000 business modules, with at least 8 MCs from the student's area of specialisation.) **Change to:** (For rules and policy governing the Honours Dissertation replacement modules, please visit the following Honours Dissertation webpage - http://bba.nus.edu/honours-dissertation.html) **Update #3 – Item 4. Field Service Project for AY2013/2014, 2014/2015 Bulletin and 2015/2016 Bulletin** **http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoB.pdf - Pg 56** **Delete:** (This requirement may be met by 8 MCs of level 4000 business modules with special approval by the Dean's Office.) **Add:** *Students can only read FSP Module once	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			Update #4 - Curriculum Structure and Requirements for BBA (Acc.) and BBA (Acc. Hons.) for AY2013/2014 - http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoB.pdf **- Pg 58** **Delete: 1. and align 15 Core Modules (worth 4 MC each) closer to the left** **Add: Table 3: List of Core Modules (example given below)** 	
29.	2 Jul 2015	FoS	**Background**: BUS has approved some changes to the Chemistry major requirements via BUS circular 26 of AY14/15. In summary, the change is to allow students majoring in Chemistry to replace 4MCs of Level 3000 CM elective module with Level 4000 CM elective module. We would need to update the 2013 and 2014 Bulletin. **Amendments are in yellow highlight:** **2013 Bulletin** Under 3.3.3.1 i.e. Bachelor of Science programme requirements for Chemistry (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf)	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>
In page 216:

Graduation Requirements

To be awarded a B.Sc. or B.Sc. (Hons.) with a primary major in Chemistry, candidates must satisfy the following:

I. B.Sc. in Chemistry

<table>
<tr><th>LEVEL</th><th>BSC IN CHEMISTRY</th><th>CUMULATIVE MCS</th></tr>
<tr><td>1000</td><td>CM1111 Inorganic Chemistry 1 CM1121 Organic Chemistry 1 CM1131 Physical Chemistry 1 CM1191</td><td>24</td></tr>
<tr><td>2000</td><td>CM2101 Physical Chemistry 2 CM2111 Inorganic Chemistry 2 CM2121 Organic</td><td>48</td></tr>
<tr><td>3000</td><td>CM3291 Advanced Experiments in Inorganic and Organic Chemistry CM3292 Advanced</td><td>72</td></tr>
</table>
* Students are allowed to replace 4MCs of Level-3000 CM elective modules with Level-4000 CM prefixed modules.
#UROPS CM3288 can be counted as 4 MC. However, if two semesters work of UROPS is completed, CM3289 is not counted.
</td><td></td></tr>
<tr><td>30.</td><td>16 & 30 Jul 2015</td><td>RO</td><td>Arising from the approved change of the minimum workload from 15 MCs to 18 MCs, with effect from AY2015/16 (see BUS Cir 27, 2014-15 dated 9 July 2015 item 14 on PVO: Change of Minimum Workload Requirement), the following amendments highlighted in yellow/red are made under Section 2.2.5 ‘Residency Requirement and Maximum Candidature ‘ at:</td><td></td></tr>
</table>

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_GeneralInformation.pdf (Pg 30 – Residency Requirement and Maximum Candidature) **Residency Requirement and Maximum Candidature** The University has established a minimum residency requirement and maximum candidature for all NUS degrees, including joint and double degrees with foreign universities. Residency, in this instance, is defined as payment of fees and ability to meet all curricular requirements of a programme of study. MCs which count towards residency for an undergraduate degree programme must come from graded modules that are factored into a student's CAP. A student registered for a Bachelor's degree must complete 50% of the required MCs for the degree programme or 80 MCs, whichever is greater, at NUS. In addition, with effect from AY2015/16, all new and returning students* are required to read at least 18 ~~15~~ MCs every semester throughout their candidature, except during the following semesters when they are allowed to read fewer MCs: • the final semester before completion of all graduation requirements for the degree; and • the semester in which the students are undergoing industrial attachment or doing their final year projects. ~~*Except students from the Faculty of Law and the Yong Siew Toh Conservatory of Music~~ For more details, please view the Frequently Asked Questions here. *(listed below for easy reference)* **Not applicable to students from the Faculty of Law and the Yong Siew Toh Conservatory of Music – please refer to respective Faculties for advice on the minimum workload to be maintained.* For students admitted from AY2007/08 onwards, the maximum candidature for: • a Bachelor degree programme with a minimum requirement of 120 MCs is 4 years; • a Bachelor with Honours degree programme with a minimum requirement of 160 MCs is 5 years; • a typical double degree programme (which may involve between 180 and 200 MCs) is 6 years. For students admitted prior to AY2007/2008, please consult the faculties concerned for details. In general, students who have completed their degree requirements by the 6th semester or earlier for 120-MC programmes and the 8th semester or earlier for 160-MC programmes, may be allowed one additional semester of study	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			(either a regular semester or Special Term) to improve their CAP standing subject to their reading: In the case of the additional semester being a regular semester, • a minimum workload of 18 ~~15~~ MCs, and • only Level-3000 or higher modules In the case of the additional semester being the Special Term, • only Level-3000 or higher modules Additionally, students are not allowed to opt for a new Minor, Second Major or Double Degree programme beyond the end of the 5th semester of study. **----------** (**FAQs on Minimum Workload** - https://share.nus.edu.sg/registrar/student/info/FAQ-Minimum-Workload.pdf **1. What is the rationale for increasing the minimum workload per semester from 15 MCs to 18 MCs?** The rationale for this increase in minimum workload to 18 MCs is to ensure that students will be on track to graduate on time or earlier, i.e., within 3 years (6 regular semesters) for 120MC degree programmes; and 4 years (8 regular semesters) for 160MC degree programmes. Based on the current undergraduate curriculum structure, the normal student workload is **20 MCs per semester**. Over the years, it is noted that of the students who were graduating late, many had a workload of 17MCs or less in one or more semesters other than the final graduating semester. **2. How will this policy of minimum workload of 18 MCs per semester be implemented?** This policy will be applicable to **all new and returning students** with effect from AY2015/16 (except for students from the Faculty of Law and the Yong Siew Toh Conservatory of Music). Exceptions to the 18 MCs minimum workload will be considered on a case by case basis (e.g., for 2nd year students who have accumulated greater than 40 MCs; 3rd year students who have accumulated greater than 80 MCs). You may write to your Home Faculty/School regarding your situation. Please detail how you will be able to graduate on time (*i.e., within 3 years for 120MC programmes and 4 years for 160MC programmes)*, despite falling below the minimum workload required. **3. I intend to 'underload' in this semester as I am interested in doing modules over the next summer/special term. Is that possible?**	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			As reading modules in the Special Term is optional, you cannot 'underload' this semester in anticipation and will have to abide by the minimum workload of 18 MCs. **4. I am taking my Final Year Project which spans over 2 semesters, how will the MCs be calculated towards the minimum workload of 18 MCs in this case?** The policy already takes such a situation into consideration. The minimum workload of 18 MCs is not applicable during the following semesters where students can read fewer MCs: • the final semester before completion of all graduation requirements for the degree; and • the semester in which the students are undergoing industrial attachment or doing their final year projects. **5. I have 20 MCs of Advanced Placement Credits (APCs) due to my polytechnic diploma and so have lesser workload to clear. Can I plan to read less than 18 MCs over 6 semesters as I intend to pursue the 120MC programme?** The minimum workload of 18 MCs is still applicable to you. The APCs would enable you to complete your degree programme earlier by at least a semester. **6. I have completed my graduation requirements last semester and had decided to stay on for an additional semester, i.e., Semester 1, AY2015/16, to pull up my CAP based on the previous policy of reading 'a minimum of 15 MCs of Level 3000 and above modules'. Does the new minimum 18 MCs rule now apply to me?** Such students who are staying on for this Semester 1, AY2015/16 'to pull up their CAP' will be subjected to the previous policy of reading '*a minimum of 15 MCs of Level 3000 and above modules*'. Students who decide to extend in Semester 2, AY2015/16 and beyond 'to pull up their CAP' will be subjected to the new policy of reading '*a minimum of 18 MCs of Level 3000 and above modules*'.)	
30.	16 Jul 2015	FoS	**Background:** BUS has approved the increase in the minimum workload per semester from the current 15 MCs to 18 MCs w.e.f AY2015, via BUS Cir No. 27, 20114-15. Therefore, FoS needs to update the 2012, 2013, 2014 and 2015 Bulletin. The minimum workload is not applicable for the following situations: (a) Final semester; (b) Semester in which students are undergoing industrial attachment or doing the final year project.	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			Amendments to make *(in yellow highlight):* **2013 Bulletin** Under 3.3.2.2-> Workload, Pg 174 (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) 1. Minimum workload: ~~15 MCs~~ 18 MCs per semester. Students are only allowed to read less than ~~15 MCs~~ 18 MCs in their graduating semester. Recommended workload: 20 MCs per semester. 2. Existing students wishing to read more than 26 MCs must have a CAP of at least 3.50. 3. Newly-matriculated students who wish to read more than 26 MCs must seek approval from the Science Dean's Office via the Centralised Online Registration System (CORS).	
31.	21 Jul 2015	SoC	**Update #1** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoC.pdf Replace this section on Programme Structure for Bachelor of Computing with texts in red: **Programme Structure for Bachelor of Computing** Students (except those doing special programmes in Computer Science – Turing Programme and von Neumann Programme) with CAP 4.00 or above can opt to do CP4101 B. Comp. Dissertation. For students aiming for first class honours, it is a mandatory requirement for them to do CP4101 B. Comp. Dissertation and obtain at least an 'A-' grade for the dissertation. Students can also complete 12 MCs (in place of the 12 MCs from CP4101) by taking their respective programme electives. Replace with: Industrial Experience Requirement Students from both the Department of Computer Science and Department of Information Systems could do 12 MCs of industrial experience content in place of either CP4101 or BT4101 (except special programme in Computer Science – Turing Programme). However, those students reading programmes from the Department of Computer Science and are aiming for Honours (Highest Distinction) must complete CP4101 BComp Disertation at the same time. For students reading Bachelor of Computing programmes from the Computer Science department, the Industrial Experience Requirement may be fulfilled by doing: (a) A 6-month internship through CP3880 Advanced Technology Attachment Programme (12 MCs) (b) Two 3-month internships through CP3200 Internship (6 MCs) and CP3202 Internship II (6MCs). With two internships, the	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			student will be able to experience work in two distinct types of organizations, such as a start-up and a MNC, or in two different industries. (c) IS4010 Industry Internship Programme (12 MCs) from the IS department. (d) A 3-month internship through CP3200 Internship (6 MCs) and an Industry Course (4 MCs). Possible Industry Course includes CP3101A Global Open Source Project and other relevant courses approved by the Department of Computer Science. The remaining 2 MCs may be satisfied using Unrestricted Electives. (e) iLead (16 MCs) or NOC (32 MCs). For students who opt for iLead or NOC, the additional MCs beyond the 12-MCs allocated to Industry Experience Training should be taken from Unrestricted Electives and/or exempted modules. (f) Other forms of industry experience approved by the Department of Computer Science. For programmes hosted by the Department of Information Systems, students can fulfil the Industrial Experience Requirement by using its IS4010 Industry Internship Programme (12 MCs). Students can choose to take on any current 12 MCs or more internship-related programmes within the School of Computing (e.g., CP3880 Advanced Technology Attachment Programme (ATAP)) and/or within NUS (e.g., Innovative Local Enterprise Achiever Development (iLEAD) and NUS Overseas College (NOC)) in place of IS4010 Industry Internship Programme to satisfy the industry experience requirement. Except for students from the Business Analytics programme, all BComp students can also complete 12 MCs (in place of the 12 MCs from CP4101) by taking their respective programme electives.	
			Update #2 http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoC.pdf **Bachelor of Computing in Computational Biology** To insert Industrial Experience as an alternative to CP4101 as below: CP4101 B. Comp. Dissertation[30] or Industrial Experience **Bachelor of Computing in Computer Science** To insert Industrial Experience as an alternative to CP4101 as below: CP4101 B. Comp. Dissertation or Industrial Experience **Bachelor of Computing in Computer Science – von Neumann Programme**	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			To insert Industrial Experience as an alternative to CP4101 as below: CP4101 B.Comp. Dissertation (with large-scale complex systems development) or Industrial Experience **Bachelor of Computing in Information Systems** To insert IS4010 Industry Internship Programme as an alternative to CP4101 as below and note @: Either: CP4101 B.Comp. Dissertation or Three IS4XXX modules or IS4010 Industry Internship Programme @ @: Students can choose to take on either IS4010 Industry Intermship Programme (12 MCs) or any current 12 MCs or more internship-related programmes within the School of Computing (e.g., CP3880 Advanced Technology Attachment Programme (ATAP)) and/or within NUS (e.g., Innovative Local Enterprise Achiever Development (iLEAD) and NUS Overseas College (NOC)) in place of IS4010 Industry Internship Programme to satisfy the industry experience requirement. **Bachelor of Science in Business Analytics** To add note @ below in red: BT4101 B.Sc. (Business Analytics) Dissertation@ @: Students can choose to take on either IS4010 Industry Intermship Programme (12 MCs) or any current 12 MCs or more internship-related programmes within the School of Computing (e.g., CP3880 Advanced Technology Attachment Programme (ATAP)) and/or within NUS (e.g., Innovative Local Enterprise Achiever Development (iLEAD) and NUS Overseas College (NOC)) in place of IS4010 Industry Internship Programme to satisfy the industry experience requirement.	
			Update #3	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoC.pdf **Bachelor of Computing in Computer Science – von Neumann Programme** At Page 95 on **Degree Requirements**: Replace: **Computer Science Breadth & Depth** Complete 24 MCs of CS modules by satisfying the following conditions: 1. Satisfy at least one vNP Focus Area by completing 3 modules in the Area Primaries, with at least one module at level-4000 or above. Computer Science Foundation modules that appear in Area Primaries can be counted as one of the 3 modules towards satisfying a Focus Area. 2. At least 12 MCs are at level-4000 or above. 3. Complete CS3213 Software Systems Design with **Computer Science Breadth & Depth** Complete 24 MCs of CS modules by satisfying the following conditions: 1. Satisfy at least one vNP Focus Area by completing 3 modules in the Area Primaries, with at least one module at level-4000 or above. Computer Science Foundation modules that appear in Area Primaries can be counted as one of the 3 modules towards satisfying a Focus Area. 2. At least 12 MCs are at level-4000 or above. 3. Complete CS3213 Software Systems Design or CS3219 Software Engineering Principles and Patterns	
			Update #4 http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoC.pdf	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			Bachelor of Computing in Computer Science – von Neumann Programme At Page 97 on **Table 3: Summary of degree requirements for Bachelor of Computing (Computer Science) – von Neumann Programme (vNP)**: Replace : **Computer Science Breadth & Depth** CS3213 Software Systems Design with **Computer Science Breadth & Depth** CS3213 Software Systems Design or CS3219 Software Engineering Principles and Patterns	
32.	17 Aug 2015	FoS	**Background:** BUS has approved the proposal for new module PC4236 Computational Condensed Matter Physics to be included in the Physics minor requirements, via **BUS Cir 1 of AY15/16**. FoS would like to update the 2012, 2013, 2014 and 2015 Bulletin. ***Amendments to make*** *(in yellow highlight):* **2013 Bulletin** **Under 3.4.3.12-> Minor in Physics, Page 340 (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf)** 1. Any one from the following: PC1141 Physics I PC1142 Physics II PC1143 Physics III PC1431 Physics IE or PC1431FC Physics IE 2. Any one from the following: PC1144 Physics IV PC1432 Physics IIE PC2232 Physics for Electrical Engineers	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			3. Any four modules from the following of which at least two modules must be Level-3000 & above: PC2130 Quantum Mechanics I PC2131 Electricity and Magnetism I PC2132 Classical Mechanics PC2230 Thermodynamics and Statistical Mechanics PC2193 Experimental Physics I PC3130 Quantum Mechanics II PC3193 Experimental Physics II PC3231 Electricity and Magnetism II PC3232 Nuclear and Particle Physics PC3233 Atomic and Molecular Physics I PC3235 Solid State Physics I PC3236 Computational Methods in Physics PC3238 Fluid Dynamics PC3243 Photonics PC3246 Nuclear Astrophysics PC3247 Modern Optics PC3251 Nanophysics PC3274 Mathematical Methods in Physics II PC4130 Quantum Mechanics III PC4232 Cosmology PC4236 Computational Condensed Matter Physics PC4240 Solid State Physics II PC4241 Statistical Mechanics PC4242 Electrodynamics PC4243 Atomic and Molecular Physics II PC4245 Particle Physics PC4246 Quantum Optics PC4248 Relativity PC4274 Mathematical Methods in Physics III PC4259 Surface Physics PC4262 Remote Sensing	
33.	21 Sep 2015	FoS	**Updates to NUS Bulletin 2012, 2013, 2014 and 2015 - Double major MA/ST provision** Additions to make are in yellow highlight below:	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			2013 Bulletin Under 3.4.2. Second major programmes, to make amendments at the end of each table, for Financial Maths, Maths and Statistics second major in the following pages: **3.4.2.3- Financial Maths** (Pg 298, http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) This second major is not offered with a primary major in Applied Mathematics, Mathematics or Quantitative Finance and minor in Mathematics or Financial Mathematics. Students reading a primary major in Statistics with second major in Financial Maths should refer to the FAQ at http://ww1.math.nus.edu.sg/undergrad.aspx?f=FAQ-2major. **3.4.2.4- Mathematics** (Pg 300, http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) This second major is not offered with a primary major in Applied Mathematics, Mathematics or Quantitative Finance and minor in Mathematics or Financial Mathematics. Students reading a primary major in Statistics with second major in Mathematics should refer to the FAQ at http://ww1.math.nus.edu.sg/undergrad.aspx?f=FAQ-2major. **3.4.2.6- Statistics** (Pg 304, http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) This second major is not offered with a primary major and minor in Statistics. Students reading a primary major in Applied Mathematics/Mathematics/Quantitative Finance with a second major in Statistics should refer to the FAQ at http://www.stat.nus.edu.sg/opencms/currentstudents/cs_ugradfaq.html#course.	
34	2 Nov 2015	SoC	**NUS Bulletin (2013-14)** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_SoC.pdf **Update #1: Bachelor of Computing in Computational Biology** Insert two new sections below before Table 1: Summary of degree requirements for B.Comp. (Computational Biology)	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			NUS Overseas Colleges (NOC) – Computational Biology Students who attend 1-year NUS Overseas Colleges (NOC) may: • Count TR3201 Entrepreneurship Practicum (8 MCs) towards computational biology electives. • Count TR3202 Start-up Internship Programme (12 MCs) towards Industrial Experience Requirement. • Count TR3203E Start-up Case Study and Analysis (8 MCs) towards level-3000 electives. Students should work on a computational biology-related project to take TR3203E. Otherwise, students should take TR3203 instead (which counts towards Unrestricted Electives). Students who attend 6-month NUS Overseas Colleges (NOC) may: • Count TR3202 Start-up Internship Programme (12 MCs) towards Industrial Experience Requirement. • Count TR3203E Start-up Case Study and Analysis (8 MCs) towards one level-3000 elective (4 MCs). The remaining 4 MCs counts towards Unrestricted Electives. Students should work on a computational biology-related project to take TR3203E. Otherwise, students should take TR3203 instead (which counts 8 MCs towards Unrestricted Electives). **University Scholars Programme (Computational Biology)** Students in the University Scholars Programme (USP) who choose the Bachelor of Computing (Computational Biology) major will take the Computational Biology programme, but with the following variations: 1. They will not be required to read University Level Requirements (20 MCs). These are replaced by 3 USP Inquiry Modules and 2 USP Foundation modules (Quantitative Reasoning Foundation and University Scholars Seminar). 2. They will not be required to read CS2101 Effective Communication for Computing Professionals. It is replaced by USP Foundation module: Writing and Critical Thinking. 3. With the special permission from the UROP coordinator and Computational Biology Programme Coordinator, they will read CP3208/CP3209 Undergraduate Research in Computing I/II with a project on computational biology as independent study modules (ISMs), which will be counted as 2 USP Inquiry modules in Sciences and Technologies Basket. 4. They will further complete 3 more USP Inquiry modules (for a total of 8 USP Inquiry modules, including CP3208 and CP3209) and the USP Reflection module (the Senior Seminar). They will have no MCs under the Unrestricted Electives. **Update #2: on Programme Requirements, texts are changed as highlighted.**	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			1. ***PROGRAMME REQUIREMENTS (Total of 120/121 MCs)*** Common Essentials CS1010 Programming Methodology[17] CS1020 Data Structures and Algorithms I[18] CS2010 Data Structures and Algorithms II[18] CS2100 Computer Organisation CS2102 Database Systems CS2103T Software Engineering[19] CS2105 Introduction to Computer Networks Major Requirements Level-1000 CS1231 Discrete Structures LSM1101 Biochemistry and Biomolecules LSM1102 Molecular Genetics MA1101R Linear Algebra I MA1102R Calculus[19a] Level-2000 CS2220 Introduction to Computational Biology CS2101 Effective Communication for Computing Professionals Either LSM2101 Metabolism and Regulation or LSM2102 Molecular Biology or LSM2103 Cell Biology ~~Either~~ ~~LSM2201A Experimental Biochemistry~~ ~~or~~ ~~LSM2202A Experimental Molecular and Cell Biology~~	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			LSM2191 Laboratory Techniques in Life Sciences or LSM2241 Introductory Bioinformatics[19b] ST2334 Probability and Statistics[20] <u>Level-3000</u> CS3230 Design & Analysis of Algorithms LSM3231 Protein Structure and Function Either CS3225 Combinatorial Methods in Bioinformatics or MA3259 Mathematical Methods in Genomics Minimum of 12 MCs from the following list[21] CS3103 Computer Networks Practice[22] Either: CS3225 Combinatorial Methods in Bioinformatics or MA3259 Mathematical Methods in Genomics CS3240 Interaction Design CS3241 Computer Graphics CS3243 Introduction to Artificial Intelligence CS3244 Machine Learning <u>Level-4000</u> CS4220 Knowledge Discovery Methods in Bioinformatics LSM4241 Functional Genomics Either (CP4101 B. Comp. Dissertation[23] or Industrial Experience Requirement (12 MCs)) and Complete 8 MCs by taking modules from CB Elective Course List) or Complete 20 MCs by taking modules from CB Elective Course List	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			Complete 8 MCs by taking modules from CB Elective Course List Computational Biology (CB) Elective Course List [24] CS4221 Database ~~Design~~ Applications Design and Tuning CS4231 Parallel and Distributed Algorithms CS4234 Optimisation Algorithms CS4235 Computational Geometry CS4237 Systems Modelling and Simulation CS4243 Computer Vision and Pattern Recognition CS4244 Knowledge-Based Systems CS4248 Natural Language Processing CS5228 Knowledge Discovery and Data Mining CS5234 Combinatorial & Graph Algorithms CS5238 Advanced Combinatorial Methods in Bioinformatics CS5340 Uncertainty Modelling in Artificial Intelligence 2. **UNIVERSITY LEVEL REQUIREMENTS** As specified in Section 3.2.1. 3. **UNRESTRICTED ELECTIVES** As specified in Section 3.2.1. Students are required to read CM1121 Basic Organic Chemistry, and PC1432 Physics IIE towards partially satisfying Unrestricted Electives. Students are encouraged to take up CP3880 Advanced Technology Attachment Programme (ATAP), and they should seek approval from the Computational Biology coordinator and ATAP coordinator. With effect from Semester 1, AY2015-16, students who have not completed CM1121 may replace it with CM1401 Chemistry for Life Sciences. **Table 1: Summary of degree requirements for B.Comp. (Computational Biology)** **Modules** | **MCs** | **Subtotals** **UNIVERSITY LEVEL REQUIREMENTS** | | 20	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates			Remarks
			PROGRAMME REQUIREMENTS		120	
			Computer Science Foundation			
			CS1010 Programming Methodology[25]	4		
			CS1020 Data Structures and Algorithms I[26]	4		
			CS2010 Data Structures and Algorithms II[26]	4		
			CS2100 Computer Organisation	4		
			CS2102 Database Systems	4		
			CS2103T Software Engineering	4		
			CS2105 Introduction to Computer Networks	4		
			Major Requirements			
			Level-1000 CS and LS Major Requirements			
			CS1231 Discrete Structures	4		
			LSM1101 Biochemistry and Biomolecules	4		
			LSM1102 Molecular Genetics	4		
			MA1101R Linear Algebra I	4		
			MA1102R Calculus [26a]	4		
			Level-2000 CS and LS Major Requirements:			
			CS2220 Introduction to Computational Biology	4		
			CS2101 Effective Communication for Computing Professionals	4		
			LSM2101 Metabolism and Regulation or LSM2102 Molecular Biology or LSM2103 Cell Biology	4		

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates			Remarks
			~~LSM2201A Experimental Biochemistry or LSM2202A Experimental Molecular and Cell Biology~~ LSM2191 Laboratory Techniques in Life Sciences or LSM2241 Introductory Bioinformatics[26b]	4		
			ST2334 Probability and Statistics[27]	4		
			Level-3000 CS and LS major requirements			
			CS3230 Design & Analysis of Algorithms	4		
			CS3225 Combinatorial Methods in Bioinformatics *or* MA3259 Mathematical Methods in Genomics	4		
			LSM3231 Protein Structure and Function	4		
			Level-3000 Electives[28] : Choose any three from the following:			
			CS3103 Computer Networks ~~and Protocol~~ Practice[29]	12		
			CS3225 Combinatorial Methods in Bioinformatics *or MA3259* Mathematical Methods in Genomics			
			CS3240 Interaction Design			
			CS3241 Computer Graphics			
			CS3243 Introduction to Artificial Intelligence			
			CS3244 Machine Learning			
			Level-4000 CS and LS Major Requirements:			
			CS4220 Knowledge Discovery Methods in Bioinformatics	4		
			LSM4241 Functional Genomics	4		
			Either (CP4101 B. Comp. Dissertation[30] and Industrial Experience Requirement) or Sufficient number of modules from CB Elective Course List	20		
			UNRESTRICTED ELECTIVES[32]		20	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

Grand Total		160

Update #3: Please insert footnotes 19a, 19b, 26a and 26b below:

Note 19a:
Students who have not taken MA1102R Calculus may replace it with MA1521 Calculus for Computing.

Note 19b:
Students who have already taken PC1432 or LSM2191 will be deemed to have satisfied the LSM2241 Introductory Bioinformatics requirement. If a student has taken both PC1432 and LSM2191, then the additional 4 MCs will count towards Unrestrictive Electives.

Note 26a:
Students who have not taken MA1102R Calculus may replace it with MA1521 Calculus for Computing.

Note 26b:
Students who have already taken PC1432 or LSM2191 will be deemed to have satisfied the LSM2241 Introductory Bioinformatics requirement. If a student has taken both PC1432 and LSM2191, then the additional 4 MCs will count towards Unrestrictive Electives.

Update #4: Amendments to footnotes 22, 29 and 32

Note 22:
~~Students who take CS3103 (Computer Networks and Protocols) must also take CS3103L (Computer Networks Laboratory).~~
CS3103 (Computer Networks and Protocols) has been renamed to Computer Networks Practice with effect from Semester 1, AY2015-16, and without co-requisite.

Note 29:
~~Students who take CS3103 (Computer Networks and Protocols) must also take CS3103L (Computer Networks Laboratory).~~
CS3103 (Computer Networks and Protocols) has been renamed to Computer Networks Practice with effect from Semester 1, AY2015-16, and without co-requisite.

Note 32:
Students are required to read CM1121 Basic Organic Chemistry, and PC1432 Physics IIE towards Unrestricted Electives.
Students are encouraged to take up CP3880 Advance Technology Attachment Programme (ATAP), and Special permission must

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			be granted by the Computational Biology coordinator and ATAP coordinator. With effect from Semester 1, AY2015-16, students who have not completed CM1121 may replace it with CM1401 Chemistry for Life Sciences.	
35.	10 Dec 2015	FoS	BUS, via Cir 10 of AY15/16 has approved the changes to the Statistics minor, to allow the replacement of 1 level 3000 Stats module with a level 4000 Stats module. The changes apply to all cohorts including retrospective cohorts. Changes are needed for the 2012, **2013**, 2014, 2015 **Bulletin.** ***Updates made*** *(in yellow highlight):* **2013 Bulletin** Under 3.4.3.13-> Minor in Statistics, Pg 342 (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) To be awarded this minor, students must: 1. Pass one of the following: a. MA1102R Calculus b. MA1312 Calculus with Applications c. MA1507 Advanced Calculus d. MA1505 Mathematics I e. MA1521 Calculus for Computing 2. Pass ST2131 Probability or ST2334 Probability and Statistics; 3. Pass ST2132 Mathematical Statistics and ST3131 Regression Analysis; and 4. Pass one module from ST32xx, and one other module from ST32xx/ST4xxx, EC3304 Econometrics II, EC4303 Econometrics III, IE3101 Statistics for Engineering Applications, DSC3215 Stochastic Models in Management, FIN3116 Options and Future, FIN3119 Risk and Insurance, MA3259 Mathematical Methods in Genomics and LSM3241 Bioinformatics and Biocomputing	
36.	14 Jan 2016	FoS	**Background:** BUS has approved the changes to the Life Sciences curriculum arising from the introduction of LSM4299 Applied Project in Life Sciences, for Cohort 2013 and onwards. Updates are needed for the **2013**, 2014 and 2015 Bulletin. ***Updates to make*** *(in yellow highlight):*	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			2013 Bulletin (Note: The following changes ride on the latest updates written in the Bulletin Updates section.) Under 3.3.3.3-> Bachelor of Science, Life Sciences major (Pg 230) (https://share.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) Life Sciences major (Honours) Level 4000 requirements	

Level 4000 (32 MCs)	Pass the Honours Year project LSM4199 or LSM4299 Applied Project in Life Sciences; and 4 LSM42XX elective modules. To be conferred one of the 3 specialisations (BMS/MCB/EVB), ~~LSM4199 and at least 2 of the 4 LSM42XX elective modules have to be listed with chosen specialisation.~~ student has to read LSM4199, which has to be completed with at least two of the four LSM42XX elective modules, all to be listed with the chosen specialisation. LSM4299 cannot be used to replace LSM4199 for fulfilling a specialisation requirement.	96

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td>37.</td><td>14 Jan 2016</td><td>FoS</td><td>
<u>Background</u>:
BUS has approved the new module LSM4210 via BUS Circular 20 of AY14/15. Therefore, we need to update the 2012, 2013, 2014 Bulletin.
Updates to make (in yellow highlight):

<u>2013 Bulletin</u>
Under 3.3.3.3 i.e. Bachelor of Science/Bachelor of Science (Hons) Programme requirements for Life Sciences, (Pg 230, https://share.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf), Level 4000 requirements for Life Sciences (Hons), Graduation requirements table, for Biomedical Science specialisation:

<table>
<tr><td></td><td>Pass
LSM4199 Honours Project in Life Sciences
Pass 5 LSM42XXs from any area of</td><td></td><td></td></tr>
<tr><td></td><td>LSM4210 Topics in Biomedical Science

LSM4211 Toxicology
LSM4212 Pharmacogenetics and Drug Responses
LSM4213 System Neurobiology
LSM4214 Cancer Pharmacology
LSM4221 Drug Discovery and Clinical Trials</td><td>Biomedical Science (BMS)</td><td></td></tr>
</table>
</td><td></td></tr>
<tr><td>38.</td><td>18 Mar 2016</td><td>FoS</td><td>
<u>Background</u>:
BUS has approved the new LSM modules- LSM4217 Functional Ageing, LSM3218 Cardiopulmonary Pharmacology and LSM3219 Neuropharmacology (offered w.e.f AY2016/17), via BUS circulars 16 and 18 of AY15/16. We would like to update these new modules in the list of electives in the Life Sciences major, for 2013, 2014 and 2015 Bulletin.
</td><td></td></tr>
</table>

<table>
<tr><th colspan="5">Bulletin Updates AY2013/14</th></tr>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>Updates to make are indicated below:

<u>2013 Bulletin</u>
a) Under 3.3.3.3 i.e. Bachelor of Science/Bachelor of Science (Hons) Programme requirements for Life Sciences, (Pg 42, https://share.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf), include LSM4217 Functional Ageing in the list of Level 4000 LSM modules for the Biomedical Science specialisation for the B.Sc. (Hons.) in Life Sciences.</td><td></td></tr>
<tr><td>39.</td><td>28 Apr 2016</td><td>FoS</td><td><u>Background</u>:
Senate has approved the Life Sciences curriculum revamp in relation to curriculum intensity and to offer alternative ‘coursework only’ route for Honours year requirements. The ‘coursework only’ route for Honours year requirements applies to Cohort 2013 and onwards, and hence, updates are needed for the current 2013, 2014 and 2015 Bulletins.

Updates to make (in yellow highlight):

<u>2013 Bulletin</u>
(Note: The following changes ride on the latest updates written in the Bulletin Updates section.)
Under 3.3.3.3-> Bachelor of Science, Life Sciences major (Pg 43)
(http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf)
Life Sciences major (Honours) Level 4000 requirements

<table>
<tr><td>Level 4000 (32 MCs)</td><td><s>Pass the Honours Year project LSM4199 or LSM4299 Applied Project in Life Sciences; and 4 LSM42XX elective modules.</s>

<s>To be conferred one of the 3 specialisations (BMS/MCB/EVB), student has to read LSM4199, which has to be completed with at least two of the four LSM42XX elective modules, all to be listed with the chosen specialisation. LSM4299 cannot be used to replace LSM4199 for fulfilling a specialisation requirement.</s>

Pass at least 32MCs via one of the following options:
<u>Honours Research Project</u>
Pass LSM4199 Honours Project in Life Sciences, AND pass another <u>4</u> LSM42xx elective modules. [If one of the three specialisations (BMS/MCB/EVB)* is to be pursued, LSM4199 and at least <u>2</u> of the <u>4</u> have to be completed, all listed with the chosen specialisation.]</td><td>96</td></tr>
</table>
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			Applied Internship Project Pass LSM4299 Applied Project in Life Sciences, AND pass another **4** LSM42xx elective modules. [If one of the three specialisations (BMS/MCB/EVB)* is to be pursued, 2 more LSM42xx elective modules have to be completed; all **6** LSM42xx listed with the chosen specialisation.] **Coursework Taught Modules** Pass **8** LSM42xx elective modules. [If one of the three specialisations (BMS/MCB/EVB)* is to be pursued, at least **6** of the **8** LSM42xx elective modules have to be listed with the chosen specialisation.]	
40.	16 May 2016	FoS	**Background:** BUS has approved the new LSM modules- **LSM4228** Experimental Models for Human Disease and Therapy, via BUS circular 23 of AY15/16. We would like to update this new module in the list of electives in the Life Sciences major, for **2013**, 2014 and 2015 Bulletins. **Updates to make** are indicated below: **2013 Bulletin** a) Under 3.3.3.3 i.e. Bachelor of Science/Bachelor of Science (Hons) Programme requirements for Life Sciences, (Pg 43, http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf), include **LSM4228** Experimental Models for Human Disease and Therapy in the list of Level 4000 LSM modules for the Biomedical Science specialisation for the B.Sc. (Hons.) in Life Sciences.	
41.	16 May 2016	FoS	**Background:** BUS has approved the new module CM4225 Organic Spectroscopy, as well as the changes to the Chemistry curriculum arising from CM4299 Applied Project in Chemistry. Updates are needed for the Chemistry curriculum for Bulletins **2013**, 2014 and 2015. ***Updates to make*** *(in yellow highlight):* **2013 Bulletin** Under 3.3.3.1-> Bachelor of Science, Chemistry major (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf) 1) Include CM4225 Organic Spectroscopy in the list of Level 4000 CM elective modules for the Medicinal Chemistry Specialisation.	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>
2) Pg 32, Table II. B.Sc. (Hon.) in Chemistry (No Specialization), to include CM4299 in the Level 4000 requirements as follows:
<table>
<tr><td>4000</td><td>CM4199A Honours Project in Chemistry (16 MCs)
Or
CM4299 Applied Project in Chemistry (16 MCs)</td><td>104</td></tr>
</table>
3) Pg 33, Table under ‘To be awarded a B.Sc. (Hons.) with Specialisation in Chemistry, candidates must satisfy the following’, to include CM4299 in the Level 3000/4000 and Level 4000 requirements as follows:
<table>
<tr><td>3000/ 4000</td><td>(a) If CM4199A Honours Project in Chemistry is in area of Specialization, any eight CM modules at Level 3000 or 4000 with at least four such modules at Level 4000a and at least four such modules in area of Specialization;b
OR
(b) If CM4199A Honours Project in Chemistry is not in area of Specialization or CM4299 Applied Project in Chemistry is read, any eight CM modules at Level 3000 or 4000 with at least four such modules at Level 4000a and at least six such modules in area of Specialization;</td><td>88</td></tr>
<tr><td>4000</td><td>CM4199A Honours Project in Chemistry (16 MCs)
Or
CM4299 Applied Project in Chemistry (16 MCs)</td><td>104</td></tr>
</table>
4) Pg 34, Table under A. B.Sc. (Hons.) in Chemistry with Specialization in Materials Chemistry; (ii) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Materials Chemistry’, to include CM4299 in the Level 4000 requirements as follows:
(ii) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Materials Chemistry, or CM4299 (Applied Project in Chemistry)
<table>
<tr><td>4000</td><td>CM4199A Honours Project in Chemistry (not in the area of Materials Chemistry);
OR
CM4299 Applied Project in Chemistry</td><td>Fulfilment of the requirements of the Chemistry major at B.Sc. level; and
Fulfilment of 100 MCs or more with a CAP of 3.50 and above</td><td>16 MCs</td></tr>
</table>
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>
5) Pg 35, Table under B. B.Sc. (Hons.) in Chemistry with Specialization in Medicinal Chemistry; (ii) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Materials Chemistry', to include CM4299 in the Level 4000 requirements as follows:

(ii) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Medicinal Chemistry, or CM4299 (Applied Project in Chemistry)
<table>
<tr><td>4000</td><td>CM4199A Honours Project in Chemistry (<u>not</u> in the area of Medicinal Chemistry);
OR
CM4299 Applied Project in Chemistry</td><td>Fulfilment of the requirements of the Chemistry major at B.Sc. level; and
Fulfilment of 100 MCs or more with a CAP of 3.50 and above</td><td>16 MCs</td></tr>
</table>

6) Pg 36, Table under C. B.Sc. (Hons.) in Chemistry with Specialization in Environment and Energy; (ii) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Environment and Energy', to include CM4299 in the Level 4000 requirements as follows:

(ii) For students who complete CM4199A (Honours Project in Chemistry) not in the area of Environment and Energy, or CM4299 (Applied Project in Chemistry)
<table>
<tr><td>4000</td><td>CM4199A Honours Project in Chemistry (<u>not</u> in the area of Medicinal Chemistry);
OR
CM4299 Applied Project in Chemistry</td><td>Fulfilment of the requirements of the Chemistry major at B.Sc. level; and
Fulfilment of 100 MCs or more with a CAP of 3.50 and above</td><td>16 MCs</td></tr>
</table>
</td><td></td></tr>
<tr><td>42.</td><td>14 Nov 2016</td><td>FoS</td><td><u>Background</u>:

BUS has approved the changes to the Joint Minor in Environmental Chemistry, via BUS Circular 9 of AY16/17, for Cohort 2014 and earlier. Updates are needed for the 2013 and 2014 Bulletin.</td><td></td></tr>
</table>

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			Updates to make *(in yellow highlight):* **2013 Bulletin** **Under 3.6.3-> Joint Minor Programme with University of Toronto, (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf), pg 90 for Joint Minor in Environmental Chemistry** **Joint Minor in Environmental Chemistry** Host Departments: Department of Chemistry (UofT), the Centre for Environment (UofT), and Department of Chemistry (NUS). To be awarded the joint minor in Environmental Chemistry, a student is required to read and pass the modules as prescribed: CM2121 Organic Chemistry GEK1535 Our Atmosphere: A Chemical Perspective or CM3261 Environmental Chemistry ENV235H Physics and Chemistry of the Evolving Earth (UofT Module) CHM317H Introduction to Instrumental Methods of Analysis (UofT Module) or CM3242 Instrumental Analysis II CHM310H Environmental Chemistry (UofT Module) CHM415H Atmospheric Chemistry (UofT Module) For NUS students whose major includes the CM modules taken for this minor, not more than 8 MCs are allowed to be double-counted. The duration of the overseas exchange is one semester in UofT.	
43.	17 Jan 2017	SoC	Updates to NUS Bulletin 2013-14 **Other Multidisciplinary/Special Programmes** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_OtherProgrammes.pdf **6.4 Double Degree in Computer Science /Information Systems and Business Administration/Business Administration (Accountancy)** **Exiting the Programme**	

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			Update 1: At page 34, amend the paragraphs as follows: ~~**For students admitted to NUS before AY2011/12**: Students in the Double Degree Programme must maintain a CAP of 4.00 or above. Students who do not maintain a CAP of 4.00 in modules contributing to the first degree for two consecutive semesters will be required to withdraw from the DDP by withdrawing from the second degree programme. Upon withdrawal, all the modules which the students have taken to fulfil the requirements of the second degree will be reflected in the transcript and included in the computation of the CAP for the single degree.~~ **For students admitted with effect from AY2011/12 ~~onwards~~ and before AY2014-15**: A student who does not maintain a CAP of 4.0 in modules contributing to the original degree, **and** a CAP of 3.5 for the second degree for any two consecutive semesters will be required to withdraw from the DDP by withdrawing from the second degree programme. Modular Credits completed in the double degree programme will be counted towards the fulfilment of the degree requirements of their single degree, subject to the normal limits of the Faculty curriculum. **6.5 Double Degree in Computer Science and Mathematics / Applied Mathematics** **Overview of Programme** Update 1: Pages 67 to 68: I. Add the following elective: CS4234 to the table: **MODULES IN "ALGORITHMS AND COMPUTATION"** II. Insert notes on: MA3215, CS3246 and CS4344 at the end of the table: **MODULES IN "MULTIMEDIA MODELLING"** **Notes:** MA3215 (Three dimensional Differential Geometry) listed in Multimedia Modelling specialisation is no longer offered from AY2015-16 and is replaced by MA4271 Differential Geometry of Curves and Surfaces. With effect from AY2015-16, CS3246 and CS4344 are no longer offered. Students who have completed them can still use them	

MODULE CODE	MODULE TITLE	MCS
CS4234	Optimisation Algorithms	4

to meet the specialisation.

III. Add the following elective: MA4271 in the table: **MODULES IN "MULTIMEDIA MODELLING"**

MODULE CODE	MODULE TITLE	MCS
MA4271	Differential Geometry of Curves and Surfaces	4

Grading and Degree Requirements

Update 2: At page 73: To add CS4234 in the **COMMON MODULES TABLE 2**

MODULE CODE	MODULE TITLE	MCS
CS4234	Optimisation Algorithms	4

Exiting the Programme

Update 3: At page 73: Amend the paragraphs (highlighted in red and yellow) below as follows:

~~For students admitted before AY2011/12: Students in the Double Degree Programme in Computer Science and Mathematics/Applied Mathematics must maintain a CAP of 4.00 or above. Students who fail to meet the criteria for two consecutive semesters will not be allowed to remain in the Double Degree Programme, but may continue with either B.Sc. or B.Comp. studies at NUS. Students who leave the programme are permitted to work instead for a single degree in their original home Faculty. Modular Credits completed in the double degree programme will be counted towards the fulfilment of the degree requirements of their single degree, subject to the normal limits of the Faculty curriculum.~~

For students admitted with effect from AY2011/12 ~~onwards~~ and before AY2014-15: A student who does not maintain a CAP of 4.0 in modules contributing to the original degree, **and** a CAP of 3.5 for the second degree for any two consecutive semesters

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			will be required to withdraw from the DDP by withdrawing from the second degree programme. Modular Credits completed in the double degree programme will be counted towards the fulfilment of the degree requirements of their single degree, subject to the normal limits of the Faculty curriculum.	
44.	23 Aug 2017	FoS	1. The changes to the Financial Mathematics minor were approved via BUS Circular 26 of AY2016/17. a) Changes to AY2013/14, AY2014/15 and AY2015/16 Bulletins AY2013/14 Bulletin: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf (pg 72 of 509) 3.4.3.5 Minor in Financial Mathematics Host Department: Mathematics The minor in Financial Mathematics allows non-mathematics majors to obtain a basic understanding of how modern mathematics is being applied in finance, banking and insurance. To be awarded a minor in Financial Mathematics, a student must pass the following six modules: 1. (MA1102R or MA1505 or MA1507 or MA1521) and (MA1104 or MA2104 or MA1506 or MA1508 or MA1508E); and 2. MA2216/ST2131 or ST2334; and 3. MA3269 and (QF3101 or FIN3102 [for BIZ students] or FIN3702 [for BIZ students] ; and ST3131 Titles of modules are listed below: MA1102R Calculus MA1104 Multivariable Calculus MA2104 (wef Sem 2 AY2017/18) Multivariable Calculus MA1505 Mathematics I MA1506 Mathematics II MA1507 Advanced Calculus MA1508 Linear Algebra with Applications MA1508E Linear Algebra for Engineering MA1521 Calculus for Computing MA2216/ST2131 Probability MA3269 Mathematical Finance I QF3101 Investment Instruments: Theory and Computation FIN3102 Investment Analysis and Portfolio Management FIN3702* Investment Analysis and Portfolio Management ST2334 Probability and Statistics	

<table>
<tr><th colspan="5">Bulletin Updates AY2013/14</th></tr>
<tr><th>S/N</th><th>Date</th><th>Faculty/
School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>ST3131 Regression Analysis

*BIZ has changed the module code of FIN3102 to FIN3702 for the cohort AY2017/18 and after.

This minor is not awarded with the primary major in Applied Mathematics, Quantitative Finance, Mathematics and second major in Mathematics or Financial Mathematics.</td><td></td></tr>
<tr><td>45.</td><td>23 Aug 2017</td><td>FoS</td><td>The changes to the Maths and Applied Maths majors and 2nd major in Maths were approved via BUS Circular 19 of AY2016/17.

a) Changes to 2nd Major in Mathematics

• For AY2013/14, AY2014/15, AY2015/16, AY2016/17 Bulletins – include MA2104 Multivariable Calculus as alternative to MA1104 in Level 1000 requirements

AY2013/14 Bulletin: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf (pg 64)

<table>
<tr><th>Module Level</th><th>2nd Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000
(16 MCs)</td><td>Pass
□ MA1100 Fundamental Concepts of Mathematics or CS1231 Discrete Structures
□ MA1101R Linear Algebra I or MA1506 Mathematics II or MA1508 Linear Algebra with Applications
□ MA1102R Calculus or MA1505 Mathematics I or MA1507 Advanced Calculus or MA1521 Calculus for Computing
□ MA1104 / MA2104 Multivariable Calculus or MA2501 Differential Equations and Systems</td><td>16</td></tr>
</table>
</td><td></td></tr>
<tr><td>46.</td><td>29 Nov 2017</td><td>FoS</td><td>Changes to the Requirements for the Minor in Physics Programme have been approved via BUS Circular 8 of AY2017/18 (For Bulletins 2017/18, 2016/17, 2015/14, 2014/15 and 2013/14):</td><td></td></tr>
</table>

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks
			AY2013/14 Bulletin – Under 3.4.3.12 Minor in Physics (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf , pg 75 to 76), kindly note the following changes: To be awarded a minor in Physics, a student must pass the following six modules: 1. Any one from the following: o PC1141 Physics I o PC1142 Physics II o PC1143 Physics III o PC1431 Physics IE or PC1431FC Physics IE 2. Any one from the following: o PC1144 Physics IV o PC1432 Physics IIE o PC2232 Physics for Electrical Engineers 3. Any four modules from the following of which at least two modules must be Level-3000 & above: o PC2130 Quantum Mechanics I o PC2131 Electricity and Magnetism I o PC2132 Classical Mechanics o PC2230 Thermodynamics and Statistical Mechanics o PC2193 Experimental Physics I o PC3130 Quantum Mechanics II o PC3193 Experimental Physics II o ALL PC32XX and PC42XX modules ~~o PC3231 Electricity and Magnetism II~~ ~~o PC3232 Nuclear and Particle Physics~~ ~~o PC3233 Atomic and Molecular Physics I~~ ~~o PC3235 Solid State Physics I~~ ~~o PC3236 Computational Methods in Physics~~ ~~o PC3238 Fluid Dynamics~~ ~~o PC3243 Photonics~~ ~~o PC3246 Nuclear Astrophysics~~ ~~o PC3247 Modern Optics~~ ~~o PC3251 Nanophysics~~ ~~o PC3274 Mathematical Methods in Physics II~~ ~~o PC4130 Quantum Mechanics III~~ ~~o PC4232 Cosmology~~	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			~~PC4236 Computational Condensed Matter Physics~~ ~~PC4240 Solid State Physics II~~ ~~PC4241 Statistical Mechanics~~ ~~PC4242 Electrodynamics~~ ~~PC4243 Atomic and Molecular Physics II~~ ~~PC4245 Particle Physics~~ ~~PC4246 Quantum Optics~~ ~~PC4248 Relativity~~ ~~PC4274 Mathematical Methods in Physics III~~ ~~PC4259 Surface Physics~~ ~~PC4262 Remote Sensing~~ This minor is not awarded with a primary major in Physics or Physics (with specialisation in Astrophysics or Physics in Technology) and second major in Physics.	
47.	18 Dec 2017	FoS	Revision to the Requirements for the Minor Programme in Aquatic Ecology was approved via BUS Circular 9 of AY2017/18 *(Changes for AY2013/14 to AY2017/18)*. The amendments are as follows: AY2013/14 Bulletin – Under 3.4.3.2 Minor in Aquatic Ecology (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf , pg 68), please note the following changes: To be awarded a minor in Aquatic Ecology, a student must pass the six modules as set out below: 1. LSM1103/LSM2252 Biodiversity 2. LSM2251 Ecology and Environment 3. GE2229 Water and Environment 4. SP3203 Aquatic Ecology Research 5. Choose 2 from the following elective modules: [For students reading the Life Sciences Major, please select at least one non-LSM-prefixed module.] [For students reading Bachelor of Environmental Studies, please select from GEH1033/GEK1548, LSM2253, LSM3264 and	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			LSM4266.] GE2215 Introduction to GIS and Remote Sensing GE2220 Terrestrial and Coastal Environments GE2228 Weather and Climate GE3216 Applications of GIS & Remote Sensing GE3221 Ecological Systems GE3223 Environmental Change in the Tropics LSM2253 Applied Data Analysis in Ecology and Evolution LSM4257 Aquatic Vertebrate Diversity GEH1033/GEK1548 How the Ocean Works [If GEH1033 is read for this Minor, it cannot be used to fulfil General Education] LSM3254 Ecology of Aquatic Environments LSM3264 Environmental Biochemistry {Not offered since AY2016/2017} LSM4261 Marine Biology LSM4264 Freshwater Biology LSM4266 Topics in Aquatic Biodiversity {Not offering from AY2018/2019 onwards}	
48.	18 Dec 2017	FoS	Arising from the recent revamp of engineering mathematics curriculum, the Department of Mathematics has introduced four new modules MA1511 (2 MCs), MA1512 (2 MCs), MA1513 (2 MCs) and MA1508E (4 MCs) to be offered from AY2017/18, for which students in different engineering departments will take prescribed combinations to suit their need. To allow flexibility for students from the Faculty of Engineering and other schools and faculties to take a Minor in Financial Mathematics, it is necessary to rephrase relevant parts of the requirements of this minor programme, which have been approved via BUS Circular 9 of AY2017/18 *(Changes for AY2017/18 to AY2013/14).* For AY2013/14 Bulletin: Under 3.4.3.5 Minor in Financial Mathematics (Bulletin Updates, http://www.nus.edu.sg/registrar/info/nusbulletin/Bulletin-Updates-AY1314.pdf , 44. Changes to Financial Mathematics minor approved, dated 23 Aug 2017), please note the following changes: To be awarded a minor in Financial Mathematics, a student must pass ~~the following six modules~~ at least 24 MC's from non-overlapping modules of the following type: 1. ~~(MA1102R or MA1505 or MA1507 or MA1521) and (MA1104 or MA2104 or MA1506 or MA1508 or MA1508E); and~~ Pass at least 8 MCs from MA1xxx, except MA1301/MA1301X; and 2. Pass MA2216/ST2131 or ST2334; and	

Bulletin Updates AY2013/14				
S/N	**Date**	**Faculty/ School/**	**Updates**	**Remarks**
			3. Pass MA3269 and (QF3101 or FIN3102 [for BIZ students] or FIN3702 [for BIZ students]) ; and ST3131 Titles of the above modules are as listed below: ~~MA1102R Calculus~~ ~~MA1104 Multivariable Calculus~~ ~~MA2104 (wef Sem 2 AY2017/18) Multivariable Calculus~~ ~~MA1505 Mathematics I~~ ~~MA1506 Mathematics II~~ ~~MA1507 Advanced Calculus~~ ~~MA1508 Linear Algebra with Applications~~ ~~MA1508E Linear Algebra for Engineering~~ ~~MA1521 Calculus for Computing~~ MA2216/ST2131 Probability MA3269 Mathematical Finance I QF3101 Investment Instruments: Theory and Computation FIN3102 Investment Analysis and Portfolio Management FIN3702* Investment Analysis and Portfolio Management ST2334 Probability and Statistics ST3131 Regression Analysis *School of Business has amended the module code of FIN3102 to FIN3702 for cohort AY2017 and after. This minor is <u>not</u> awarded with the primary major in Applied Mathematics, Quantitative Finance, Mathematics, and second major in Mathematics or Financial Mathematics.	
49.	18 Dec 2017	FoS	Arising from the recent revamp of engineering mathematics curriculum, Department of Mathematics has introduced four new modules MA1511 (2 MCs), MA1512 (2 MCs), MA1513 (2 MCs) and MA1508E (4 MCs) to be offered from AY2017/18, for which students in different engineering departments will take prescribed combinations to suit their need. To allow flexibility students from the Faculty of Engineering and other schools and faculties to take a Minor in Mathematics, it is necessary to rephrase relevant parts of the requirements of this minor programme, which have been approved via BUS Circular 9 of AY2017/18. <u>AY2013/14 Bulletin</u>	

Bulletin Updates AY2013/14

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>Updates</th><th>Remarks</th></tr>
<tr><td></td><td></td><td></td><td>Under 3.4.3.8 Minor in Mathematics (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf , pg 73), please note the following changes:

To qualify for a minor in Mathematics, a student should pass ~~six~~ at least 24 MC's from non-overlapping modules of the following type:

1. ~~Any two of~~ Pass at least 8 MC's from the following modules:
a. MA1xxx modules except MA1301, or
b. CS1231
2. Pass ~~A~~ any two MA2xxx modules
3. Pass ~~A~~ any two MA3xxx or higher modules, excluding MA3311 and MA3312</td><td></td></tr>
<tr><td>50.</td><td>20 Dec 2017</td><td>FoS</td><td>Arising from the recent revamp of the Engineering Mathematics curriculum, the Department of Mathematics has introduced four new modules MA1511 Engineering Calculus (2 MCs), MA1512 Differential Equations for Engineering (2 MCs), MA1513 Linear Algebra with Differential Equations (2 MCs) and MA1508E Linear Algebra for Engineering (4 MCs) to be offered from AY2017/18, for which students in different engineering departments will take prescribed combinations to suit their need. To allow flexibility for students from the Faculty of Engineering and other schools and faculties to take a Second Major in Mathematics, it is necessary to revise the relevant parts of the requirements of the programme.

AY2013/14 Bulletin

Under 3.4.2.4 Second Major in Mathematics (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201314_FoS.pdf , pg 64-65; Bulletin Updates, http://www.nus.edu.sg/registrar/info/nusbulletin/Bulletin-Updates-AY1314.pdf , No. 45, Update dated 23 Aug 2017), the changes are as follows:

a) To be awarded a second major in Mathematics, candidates must satisfy at least 48 MCs from non-overlapping modules of the following:

<table>
<tr><th>Module Level</th><th>2nd Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000
(16 -18 MCs)</td><td>Pass
• MA1100 Fundamental Concepts of Mathematics or CS1231</td><td>16 -18</td></tr>
</table>
</td><td></td></tr>
</table>

Bulletin Updates AY2013/14

S/N	Date	Faculty/ School/	Updates	Remarks

	Discrete Structures • MA1101R Linear Algebra I or MA1506 Mathematics II or MA1508 Linear Algebra with Applications or MA1508E Linear Algebra for Engineering or (MA1513 Linear Algebra with Differential Equations and one additional module from List II) • MA1102R Calculus or MA1505 Mathematics I or MA1507 Advanced Calculus or MA1521 Calculus for Computing or (MA1511 Engineering Calculus and MA1512 Differential Equations for Engineering) • MA1104 / MA2104 Multivariable Calculus or MA2501 Differential Equations and Systems	
2000 (16-19 MCs)	Pass • MA2101/MA2101S Linear Algebra II • MA2108/MA2108S Mathematical Analysis I • MA2216/ST2131 Probability • One additional module from List II, III, IV	32-37
3000 (16-19 MCs)	Pass • MA3110/MA3110S Mathematical Analysis II • MA3111/MA3111S Complex Analysis I • Two additional modules from List III, IV	48-56

b) For List IV, note the following changes:

List IV:
All MA modules at Level-4000 or higher
CS4236 Cryptography Theory and Practice
CS5230 Computational Complexity
CS5237 Computational Geometry and Applications
EC4101/ EC4301 Microeconomics Analysis III
EC5104/EC5104R Mathematical Economics
PC4248 Relativity
PC4274 Mathematical Methods in Physics III
ST4238 Stochastic Processes I