Archived NUS Bulletin 2017-18
Section 22: Bulletin Updates

(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

- FASS
- BIZ
- SoC
- SCALE
- FoD
- SDE
- FoE
- NUSMed
- FoS
- LKYSPP
- Yale-NUS
- YSTCM
- RVRC
- RO

(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)

- FoS

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
1.	22 Jun 2017	FASS	http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/department-degree-requirements/centre-for-language-studies/korean-language/ G Korean Language **Entry Requirements** There are no prerequisites for students who wish to enroll in LAK1201 Korean 1. Students with previously acquired knowledge of Korean may be admitted into a module at a higher level, subject to a placement test. Students may contact the Centre for Language Studies for further information on the placement tests. Students on the SEP Korean language preparation programme run by the Centre for Language Studies for the International Relations Office will read four modules, LAK1201 Korean 1, LAK2201 Korean 2, LAK3201 Korean 3 and LAK3202 Korean 4. Only freshmen who have just been accepted into the university may apply to the Centre for Language Studies in June for admission into the SEP language preparation programme. All other interested students may wish to direct their enquiries to the Centre for Language Studies. http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/department-degree-requirements/regular-programmes/european-studies/ **Minor** Pass at least 24 MCs of EU and EU-recognised (include French/German/Spanish language modules) modules, which include the following: 1. EU1101E Making of Modern Europe 2. a minimum of 4 MCs at Level-3000 ~~(including French OR German OR Spanish language modules)~~ 3. a minimum of 8 MCs of EITHER French OR German OR Spanish language (LAF/LAG/LASXXXX) modules, subject to a maximum of 12 MCs. (See Note 1 t
2.	22 Jun 2017	FASS	http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/department-degree-requirements/centre-for-language-studies/french-and-german-languages/ D French and German Languages

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			The Centre for Language Studies currently offers a number of French and German language modules from elementary to advanced levels. European Studies major students should refer to the European Studies Department Degree Requirements at Section 2.2.2.1 G for the language requirements for European Studies. There are no prerequisites or qualifying tests for students who wish to enroll in LAF1201 French 1 and LAG1201 German 1. These two modules are meant only for complete beginners who have not learned the languages previously. Students with previous knowledge must take placement tests to be placed at the appropriate level. Students on the SEP French/German language preparation programme run by the Centre for Language Studies for the International Relations Office will read four modules, either LAF1201 French 1, LAF2201 French 2, LAF3201 French 3 and LAF3202 French 4 or LAG1201 German 1, LAG2201 German 2, LAG3201 German 3 and LAG3202 German 4. Only freshmen who have just been accepted into the university may apply to the Centre for Language Studies in June/July for admission into the SEP language preparation programme. All other interested students may wish to refer to the Centre for Language Studies website for more information. **Entry Requirements** There are no prerequisites for students who wish to enrol in LAF1201 French 1/LAG1201 German 1. These modules are meant for complete beginners who have not learned French/German previously. Students with previously acquired knowledge of French/German may be admitted into a module at a higher level, subject to a placement test. Students may contact the Centre for Language Studies for further information on the placement tests. Exemptions may apply for European Studies major students if they have the appropriate level of proficiency. Enquiries about exemptions may be directed to the Office of Programmes in FASS.
3.	27 Jun 2017	FASS	URL: http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/ To graduate with a BA (Hons) or BSocSci (Hons) degree, FASS students must have declared honours track* and accumulated a minimum of 160 Modular Credits (MCs) and achieved a Cumulative Average Point (CAP) of at least

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			3.20. Students who choose not to or do not complete the honours requirements may graduate with a BA degree, after accumulating a minimum of 120 MCs at a CAP of at least 2.00. The requirements for graduation are: 1. General Education Requirements • Students will be required to read one General Education Module (GEM) from each of the five pillars. More information can be found here. • It is compulsory for FASS students to take GET1031A to fulfil the Thinking and Expression pillar. 2. Programme Requirements which include: • Faculty Core Requirements • Major Requirements 3. Unrestricted Elective Modules (BUS Cir28 2017-06-15 RO351-17(1))
4.	29 Jun 2017	FASS	The adjustment to the LSM-recognised elective slot for the Life Sciences major, 2nd major and minor was approved via BUS Circular 27 of AY2016/17. AY2017/18 Bulletin: Update 1: Under 3.3.3.5 Life Sciences http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/life-sciences/ , the change to the Level 3000 requirements of the BSc and BSc(Hons) in Life Sciences is as follows: i) Under the BSc with primary major in Life Sciences, Level 3000 requirements: Pass 4 LSM32XX elective modules (except LSM3289), one of which may be a LSM-recognised elective module (up to 4 MCs). Pass four LSM32xx elective modules (except LSM3289), of which up to two (up to 8MC) may be LSM42xx (except LSM4299) and/or LSM-recognised elective modules.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
ii) Under B.Sc. (Hons.) with a primary major in Life Sciences or Life Sciences (with specialisation in Biomedical Science, Molecular and Cell Biology or Environmental Biology), Level 3000 requirements:

Pass 4 LSM32XX elective modules (except LSM3289), one of which may be a LSM-recognised elective module (up to 4 MCs).
Pass four LSM32xx elective modules (except LSM3289), of which up to two (up to 8MC) may be LSM42xx (except LSM4299) and/or LSM-recognised elective modules.

Update 2:

Under 3.4.2.3 Second Major in Life Sciences, http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/second-major-programmes/life-sciences/ , the change to the Level 3000 requirements of the Second Major in Life Sciences is as follows:

<table>
<tr><td>Level 3000

(16 MCs)</td><td><s>Pass four LSM32XX elective modules (except LSM3289), one of which may be a LSM recognised elective module (up to 4MCs).</s>

Pass four LSM32xx elective modules (except LSM3289), of which up to two (up to 8MC) may be LSM42xx (except LSM4299) and/or LSM-recognised elective modules.</td><td>48</td></tr>
</table>

Update 3:
Under 3.4.3.8 Minor in Life Sciences http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-life-sciences/ , the change to the Level 3000 requirements of the Minor in Life Sciences is as follows:
To be awarded a minor in Life Sciences, a student must pass six of the following modules:

1. Two modules from the following
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>a. LSM1102 Molecular Genetics
b. LSM1105 Evolutionary Biology
c. LSM1106 Molecular Cell Biology
2. Two LSM21xx/22xx modules except LSM2288 and LSM2289.
3. Pass two LSM32XX modules except LSM3288 and LSM3289). Alternatively, up to one module may be LSM42xx (except LSM4299). Pass two LSM32xx elective modules (except LSM3288 and LSM3289), of which one (up to 4MC) may be LSM42xx (except LSM4299) or LSM-recognised elective module.</td></tr>
<tr><td>5.</td><td>29 Jun 2017</td><td>FASS</td><td>The proposal to reduce the Quantitative Finance (QF) major requirements by 8 or 9 MCs, to allow 31-32MC of UE space for QF students in the BSc(Hons) programme for the AY2017 cohort and after, has been approved via BUS Circular 27 of AY2016/17.
The following changes need to be made to the QF major requirements in the AY2017/18 Bulletin:
http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/quantitative-finance/

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><th>Module Level</th><th>Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>Level-1000
(~~24~~ 16 MCs)</td><td>CS1010 / CS1010E / CS1010S/ CS1010X Programming Methodology

~~CS1020 / CS1020E Data Structures and Algorithms I~~

~~ACC1002 Financial Accounting~~
ACC1701 Accounting for Decision Makers
MA1101R Linear Algebra I
MA1102R Calculus
~~MA1104 Multivariable Calculus~~</td><td>~~24~~
16</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			Level-2000 (20-~~22~~ 21MCs)	Pass ~~FIN2004~~ FIN2704 Finance MA2213 Numerical Analysis I or DSA2102 Essential Data Analytics Tools: Numerical Computation MA2216 / ST2131 Probability ~~MA2101 / MA2101S Linear Algebra II~~ MA2108 / MA2108S Mathematical Analysis I MA2104 Multivariable Calculus	~~44-46~~ 36-37
			Level-3000 (28 MCs)	Pass QF3101 Investment Instruments: Theory and Computation MA3269 Mathematical Finance I ST3131 Regression Analysis Two modules from the following: • ~~CS3230 Designs and Analysis of Algorithms~~ • MA3220 Ordinary Differential Equations • MA3236 Nonlinear Programming • MA3252 Linear and Network Optimisation • MA3264 Mathematical Modelling Two modules from the following: • FIN~~3101~~3701 Corporate Finance • FIN~~3103~~3703 Financial Markets • FIN~~3117~~3713 Bank Management • FIN~~3118~~3714 Financial Risk Management	~~72-74~~ 64-65
			Level-4000 and above (32 MCs)	Pass QF4199 Honours Project in Quantitative Finance QF4102 Financial Modelling MA4269 Mathematical Finance II Three modules from the following:	~~104-106~~ 96-97

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	• QF5210 Financial Time Series: Theory and Computation • ~~FIN4111~~ FIN4711 Research Methods in Finance • ~~FIN4112~~ FIN4761 Seminar in Finance • MA4254 Discrete Optimisation • MA4255 Numerical Partial Differential Equations • MA4260 Stochastic Operations Research • MA4264 Game Theory • ST4233 Linear Models • ST4245 Statistical Methods for Finance • MA5245 Advanced Financial Mathematics • MA5248 Stochastic Analysis in Mathematical Finance	

Summary of Requirements	B.Sc.	B.Sc. (Hons.)
University Requirements	20 MCs	20 MCs
Faculty Requirements	12 MCs*	12 MCs*
Major Requirements	~~72~~ ~~74~~ 64 - 65 MCs	~~104~~ ~~106~~ 96 – 97 MCs
Unrestricted Elective Modules	~~16 – 14~~ 23 - 24 MCs	~~24~~ ~~22~~ 31 – 32 MCs
Total	120 MCs	160 MCs

* Up to 4 MCs of Faculty requirements of the total of 16 MCs required for the B.Sc. (Hons.) programme are fulfilled through the reading of MA/CS modules within the major.

Students of the B.Sc. and B.Sc. (Hons.) programmes are required to fulfil the remaining 12 MCs of Faculty requirements from any three (3) of the following subject groups: Chemical Sciences, Life Sciences, Physical Sciences and Multidisciplinary & Interdisciplinary Sciences, but not from the following subject groups: Computing Sciences and Mathematical & Statistical Sciences.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>6.</td><td>29 Jun 2017</td><td>FASS</td><td>In order to streamline our current push for programme pairing and to extend opportunities to the whole student population, our department has decided to change their Life Sciences Minor from a restricted minor to an open minor.

With that, please assist to update the information on the NUS Minor Programmes page.

<table><tr><td>Life Sciences</td><td>Department of Biological Sciences</td><td><s>Restricted</s>
Open</td></tr></table></td></tr>
<tr><td>7.</td><td>17 Jul 2017</td><td>FASS</td><td>GL updates: http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/department-degree-requirements/regular-programmes/global-studies/

I Global Studies

Globalisation calls for a way of understanding contemporary issues that goes beyond the boundaries of any single discipline. Global Studies is a new, multidisciplinary field of inquiry that examines the processes and effects of globalisation across political, economic, social, and cultural domains around the world. The field builds on social science concepts and area studies expertise and focuses especially on problems of profound public policy significance.

The Global Studies Programme is housed in the Department of Political Science but draws on the broader strengths of the Faculty of Arts and Social Sciences. It provides students with the background required to understand and address the challenging policy issues confronting the world today. Students learn how the local communities and environments in which peoples live their lives are affected by national, regional, international, and transnational cultural flows, environmental processes, political ideologies, and economic relationships. Coupling broad, multidisciplinary education with a focus on policy and governance, the Programme is designed to</td></tr>
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S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			cultivate the combination of expertise and creative, critical thinking skills that are necessary for the next generation of global leaders and citizens. Entry Requirements A candidate who proposes to read Global Studies should have a good pass in General Paper of the GCE 'A' Level Examination and other related subjects. Subject Requirements Cohort 2016 onwards Single Major [BA (Hons)] • Pass GL1101E. This will be counted towards the Faculty Core or UE requirements. • Pass at least 92 MCs of GL modules or GL-recognised non-language modules and 16 MCs of Language Requirement (using the modular credits from the Unrestricted Elective Component) which include the following: 1. GL2101 2. GL2102 3. GL2103 4. GL3101 / SC2101 (See Note 8) 5. GL4101 6. GL4102 • minimum of 16 MCs from ONE of the following themes (See Note 1): 1. Business and Transnational Cultures 2. Colonialism and Post-Colonialism 3. Global Economics and Development 4. Global Health and Environment 5. International Communications 6. Policy Making

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			7. Population and Migration 8. Religion and Ethnicity 9. Technology and Globalisation 10. War and Security • minimum of 16 MCs from ONE of the following regions: 1. East Asia: China, Japan and Korea 2. South Asia 3. Southeast Asia 4. Europe 5. Americas • minimum of 16 MCs in a single language (Classified under Unrestricted Electives) (See Note 2) • minimum of 60 MCs of Level-3000 or higher GL or GL-recognised modules (including GL3101), with I. minimum of 40 MCs of Level-4000 or higher GL or GL-recognised modules (including GL4101 and GL4102) II. maximum of two Level-5000 GL or GL-recognised modules (subject to the department's approval) • a maximum of 16MCs may be double counted from the secondary major towards the GL major • No more than 50% of the electives may be from a single discipline. Note 1: Students who demonstrate strong interest in a topic that is outside of the ten themes may design their own theme in consultation with an academic advisor. Note 2: While this is a major requirement, the 16 MCs of language modules will be classified under the student's Unrestricted Electives which is on top of the 92 MCs required for the major. Note 3: To qualify for honours track, students must have completed 110 MCs, including 52 MCs of major requirements AND have a minimum CAP of 3.20.

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			Note 4: The Honours Thesis (HT) worth three modules (15 MCs) is not compulsory for the Honours degree. Students who do not read the Honours Thesis can undertake the Independent Study Module (ISM) or other level-4000 modules in their respective majors. I. To qualify for the HT (15 MCs): (a) Complete 110 MCs including 52 MCs of GL/GL recognised non-language modules (b) Obtain a minimum SJAP of 4.00 and CAP of 3.50. Students may seek a waiver of the SJAP pre-requisite from the department if they have a minimum CAP of 4.25 after completing 110 MCs. In order to obtain Honours (Highest Distinction), students must achieve a CAP of 4.50 and pass the Honours Thesis. II. To qualify for the ISM (5MCs): (a) Complete at least 100 MCs, including 52MCs of GL/GL recognised non-language modules (b) Obtain a minimum CAP of 3.20 Note 6: Students may also read a Level-4000 Independent Studies Module (5 MCs). The Level-4000 ISM carries a prerequisite of 100 MCs completed, including 60 MCs in GL/GL recognised non-language modules, with a minimum CAP of 3.20. It precludes the Honours Thesis/Project Note 7: All Level-4000 modules carry a general prerequisite of having completed 80 MCs, including 28MCs in the Major, with a minimum CAP of 3.20 OR being on the Honours track (some Level-4000 modules may have different prerequisites). Note 8: SC2101 has been approved as a substitute for GL3101 only when the latter is not offered. Please refer to the double counting policy at the following website: http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html For the latest updates, please visit the Programme website at: http://www.fas.nus.edu.sg/globalstudies Single Major (BA)

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			• Pass GL1101E. This will be counted towards the Faculty Core or UE requirements. • Pass at least 52 MCs of GL modules or GL-recognised non-language modules and 16 MCs of Language Requirement (using the modular credits from the Unrestricted Elective Component) which include the following: 1. GL2101 2. GL2102 3. GL2103 4. GL3101/SC2101 (See Note 4) • minimum of 16 MCs from ONE of the following themes (See Note 1): 1. Business and Transnational Cultures 2. Colonialism and Post-Colonialism 3. Global Economics and Development 4. Global Health and Environment 5. International Communications 6. Policy Making 7. Population and Migration 8. Religion and Ethnicity 9. Technology and Globalisation 10. War and Security • minimum of 16 MCs from ONE of the following regions: 1. East Asia: China, Japan and Korea 2. South Asia 3. Southeast Asia 4. Europe 5. Americas • minimum of 16 MCs in a single language (Classified under Unrestricted Electives) (See Note 2) • minimum of 60 MCs of Level-3000 or higher GL or GL-recognised modules (including GL3101) (See Note 3)

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			1. minimum of 40 MCs of Level-4000 or higher GL or GL-recognised modules (including GL4101 and GL4102) 2. maximum of two Level-5000 GL or GL-recognised modules (subject to the department's approval) • a maximum of 16MCs may be double counted from the secondary major towards the GL major • No more than 50% of the electives may be from a single discipline. Note 1: Students who demonstrate strong interest in a topic that is outside of the ten themes may design their own theme in consultation with an academic advisor. Note 2: While this is a major requirement, the 16 MCs of language modules will be classified under the student's Unrestricted Electives which is on top of the 52 MCs required for the major. Note 3: Students are allowed to read Level-4000 modules subject to departmental approval. Note 4: SC2101 has been approved as a substitute for GL3101 only when the latter is not offered. Please refer to the double counting policy at the following website: http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html For the latest updates, please visit the Programme website at: http://www.fas.nus.edu.sg/globalstudies Minor • Pass at least 24 MCs of modules, which include the following: 1. GL1101E Global Issues 2. GL2101 Origins of the Modern World 3. GL2102 Global Political Economy 4. GL2103 Global Governance • a minimum of 8 MCs from Theme modules: 1. Business and Transnational Cultures 2. Colonialism and Post-Colonialism

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			3. Global Economics and Development 4. Global Health and Environment 5. International Communications 6. Policy Making 7. Population and Migration 8. Religion and Ethnicity 9. Technology and Globalisation 10. War and Security • a maximum of 8 MCs may be read at level 1000 • a minimum of 4 MC must be read at level 3000 or higher* *Students may read level 4000 or higher modules subject to department's approval. • GL major students are not permitted to read the GL minor. • A maximum of 8 MCs from the minor can be used to satisfy the requirements of a major or another minor. For information on the double counting policy please refer to For the latest updates, please visit the Programme website at: http://www.fas.nus.edu.sg/globalstudies Please refer to the double counting policy at the following website: http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html
8.	13 Jul 2017	FASS	URL: http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/b-a-hons-or-b-soc-sci-hons-degree-usp-students/ To graduate with a BA (Hons) or BSocSci (Hons) degree, USP students must have: 1. Fulfilled the requirements specified below and obtained a minimum of 160 MCs. 2. Obtained a minimum CAP of 3.00 for the award of an Honours degree. Additionally, USP students are required to attain a minimum CAP of 3.50 to fulfil USP requirements.

<table>
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<tr><td></td><td></td><td></td><td>
3. Completed the BA (Hons) or BSocSci (Hons) degree within a maximum of ten semesters, unless otherwise approved by the University.
<table>
<tr><th>Requirements</th><th>MCs</th></tr>
<tr><td>(1) USP Requirements</td><td>40-48*</td></tr>
<tr><td>Programme</td><td></td></tr>
<tr><td>(2) Faculty Core modules</td><td>16</td></tr>
<tr><td>i) Exposure modules</td><td>12</td></tr>
<tr><td>ii) Writing, Expression and Communication (WEC) modules**</td><td></td></tr>
<tr><td>• FAS1102 Public Writing and Communication</td><td>4</td></tr>
<tr><td>(3) Single Major***
(not including the Major’s Exposure module which is counted in Faculty Core or Unrestricted Electives)</td><td>84****</td></tr>
<tr><td>Unrestricted Electives</td><td></td></tr>
<tr><td>(4) Unrestricted elective modules</td><td>20-12*</td></tr>
<tr><td>i.) GER1000</td><td>4</td></tr>
<tr><td>ii.) GET1031A</td><td>4</td></tr>
<tr><td>iii.) Modules read outside the major</td><td>8-0*</td></tr>
<tr><td>iv.) Modules read within or outside the major</td><td>4</td></tr>
<tr><td>Total</td><td>160</td></tr>
</table>
* The number of MCs read here would depend on the number of USP ISMs read under the major requirements. A student is required to read at least one, but no more than two USP ISMs. If a student reads a USP ISM towards his/her major requirements, the number of MCs required under (1) would decrease. The student would then need to read modules under Unrestricted Electives to meet 160 total MCs for graduation. The table below summarises the possible permutations for 2 USP ISMs. (The table below had been removed.)
** USP students are exempt from FAS1101, which is the other WEC module.

*** Students must earn the stipulated minimum number of MCs from level-3000 and level-4000 modules of their major. The Faculty requires students to earn a minimum of 20 MCs from level-3000 modules and a minimum of 40 MCs from level-4000 modules or higher in their major. However, for both levels, some majors may stipulate a
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S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			higher number for their minimum. Students may be allowed, in lieu of their level-4000 modules, a maximum of two level-5000 modules (subject to the department's approval and module pre-requisites, if any,) to fulfil graduation requirements. Students should take note that level-5000 FASS modules offered to undergraduates will be worth 5 MCs each. The level-5000 module codes for undergraduates will have the suffix 'R' (for example: EC5555R). Some departments as a matter of policy do not allow undergraduates to read their graduate modules. Level-5000 Independent Studies Modules (ISMs) or level-6000 modules (including ISMs) will not be open to undergraduates. Please refer to the requirements specified by the department/programme for each subject. **** The minimum MCs requirement for a major at honours level is 84 MCs (some majors may require more) and the minimum MCs requirement for UE modules read outside the major is 4 MCs (GER1000).
9.	17 Jul 2017	FASS	The URL for the Psychology updates is http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/department-degree-requirements/regular-programmes/psychology/ Page 1 O Psychology The objective of the Psychology major is to provide students with a basic academic grounding in Psychology. Topics include human development, social and cognitive processes, mental health and adjustment of individuals, and the applications of psychology. The objective of the Honours degree in Psychology is to provide the additional academic breadth and depth of coverage needed as the foundation for further research, applied or professional degrees, or for supervised employment or training in psychology. It also aims to provide training in thinking and analytical skills, and content useful to honours graduates in general, whether or not they intend to pursue psychology-related careers. Entry Requirements The Psychology major and minor programmes are open to all matriculated students of the Faculty of Arts and Social Sciences who have obtained a minimum grade of 'C6' in GCE 'O' Level Mathematics or equivalent. IB applicants are eligible if they have taken at least SL Mathematical Studies. Prospective students who would like to major in Psychology at NUS must meet the prerequisites for Psychology and obtain a grade of B- or better for the PL1101E Introduction to Psychology and a grade of B- or better for the PL2131 Research and Statistical Methods I modules. Students who achieved the minimum B- grades

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			for PL1101E and PL2131 but have chosen to exercise the Satisfactory/Unsatisfactory (S/U) option for these two modules will still eligible to declare Psychology as their major. Subject Requirements Single Major [B.Soc.Sci. (Hons.)] 1. Pass PL1101E Introduction to Psychology. This will be counted towards the Faculty Core or UE requirements. 2. Pass at least 84 MCs of PL or PL-recognised modules which include the following: PL2131 Research and Statistical Methods I PL2132 Research and Statistical Methods II PL3232 Biological Psychology PL3233 Cognitive Psychology PL3234 Developmental Psychology PL3235 Social Psychology PL3236 Abnormal Psychology PL3231 Independent Research Project OR one of the PL328x lab modules*. a minimum of 52 MCs at Level-2000 or higher (excluding the modules above), with a minimum of 40 MCs at Level-4000 or higher a maximum of one other PL328X lab module not taken in (8) above* a maximum of 2 PL modules at Level-5000 Page 2 a maximum of 2 PL-recognised modules Note 1: *As PL3231 and the PL328x lab modules serve the same purpose of strengthening the empirical research skills of students, students are only allowed to read a maximum of 2 such modules, in any of the following combinations: (1) PL3231 (2) PL328x (3) PL3231 + PL328x (4) PL328x + PL328x Note 2: The following are PL-recognised modules:

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			PH2201 Introduction to the Philosophy of Science PH2241 Philosophy of Mind PH3201 Philosophy of Social Science LSM3215 Neuronal Signaling and Memory Mechanisms LSM3216 Neuronal Development and Diseases SW3208 Negotiation & Conflict Resolution (applicable for Cohort 2016 onwards) SW3209 Counselling Theories & Practice (applicable for Cohort 2016 onwards) Note 3: Students intending to do a double major in PL and SW are advised to read PL2131 in their first year because the module serves as a gate for determining whether one could pursue a major in Psychology and also because it could be read in place of SW3101. Note 4: Students are allowed to map a maximum of 2 PL level-4000 modules taken during exchange. Note 5: To declare an Honours track, students must have completed the following: Cohort 2012 – 2015: Completed at least 110 MCs, including 60 MCs in the Major, with a CAP of 3.20 and above. Cohort 2016 onwards: Completed at least 110 MCs, including 44 MCs in the Major, with a CAP of 3.20 and above. Note 6: The Honours Thesis/Project (15 MCs) is optional. To qualify for the Honours Thesis/Project, students must be on the Honours Track. In order to obtain First Class Honours/Honours (Highest Distinction), students must achieve the following: Cohort 2012 onwards: A CAP of 4.50 or higher AND read and passed PL4401 Honours Thesis. Note 7: Students who do not attempt the Honours Thesis/Project will read Level-4000 or higher PL modules to fulfil the Honours Requirements. Page 3 Note 8: Students may also read a Level-4000 Independent Study Module (5 MCs). This Level-4000 ISM carries the following prerequisites: Cohort 2012 – 2015: Completed 100 MCs, including 60 MCs in PL, with a minimum CAP of 3.20. Cohort 2016 onwards: Completed 100 MCs, including 44 MCs in PL, with a minimum CAP of 3.20. This ISM and the Honours Thesis/Project preclude one another. Note 9: All level-4000 modules carry the following general prerequisites:

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Cohort 2012 onwards: Completed 80 MCs, including 28 MCs in the Major, with a minimum CAP of 3.20 OR being on the Honours Track (some Level-4000 modules may have different prerequisites). Single Major (B.A.) 1. PL1101E Introduction to Psychology. This will be counted towards the Faculty Core or UE requirements. 2. At least 44 MCs of PL or PL-recognised modules which include the following: PL2131 Research and Statistical Methods I PL2132 Research and Statistical Methods II PL3232 Biological Psychology PL3233 Cognitive Psychology PL3234 Developmental Psychology PL3235 Social Psychology PL3236 Abnormal Psychology PL3231 Independent Research Project OR one of the PL328x lab modules* a minimum of 12 MCs at Level-2000 or higher (excluding the modules above), with a maximum of one other PL328X lab module* a maximum of 2 PL-recognised modules Note 1: Students are not allowed to read Level-5000 PL modules. Note 2: *As PL3231 and the PL328x lab modules serve the same purpose of strengthening the empirical research skills of students, students are only allowed to read a maximum of 2 such modules, in any of the following combinations: (1) PL3231 (2) PL328x (3) PL3231 + PL328x (4) PL328x + PL328x Page 4 Note 3: The following are PL-recognised modules: PH2201 Introduction to the Philosophy of Science

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			PH2241 Philosophy of Mind PH3201 Philosophy of Social Science LSM3215 Neuronal Signaling and Memory Mechanisms LSM3216 Neuronal Development and Diseases SW3208 Negotiation & Conflict Resolution (applicable for Cohort 2016 onwards) SW3209 Counselling Theories & Practice (applicable for Cohort 2016 onwards) Note 4: Students intending to do a double major in PL and SW are advised to read PL2131 in their first year because the module serves as a gate for determining whether one could pursue a major in Psychology and also because it could be read in place of SW3101. Second Major 1. Pass PL1101E Introduction to Psychology. This will be counted towards the Faculty Core or UE requirements 2. Pass at least 44 MCs of PL or PL-recognised modules which include the following: PL2131 Research and Statistical Methods I PL2132 Research and Statistical Methods II PL3232 Biological Psychology PL3233 Cognitive Psychology PL3234 Developmental Psychology PL3235 Social Psychology PL3236 Abnormal Psychology PL3231 Independent Research Project OR one of the PL328x lab modules* a minimum of 12 MCs at Level-2000 and Level-3000 (excluding modules above), with a maximum of one other PL328X lab module* a maximum of 2 PL-recognised modules Note 1: Students are not allowed to read Level-4000 modules. Note 2: *As PL3231 and the PL328x lab modules serve the same purpose of strengthening the empirical research skills of students, students are only allowed to read a maximum of 2 such modules, in any of the following combinations: (1) PL3231 (2) PL328x (3) PL3231 + PL328x

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			(4) PL328x + PL328x Note 3: Page 5 The following are PL-recognised modules: PH2201 Introduction to the Philosophy of Science PH2241 Philosophy of Mind PH3201 Philosophy of Social Science LSM3215 Neuronal Signaling and Memory Mechanisms LSM3216 Neuronal Development and Diseases SW3208 Negotiation & Conflict Resolution (applicable for Cohort 2016 onwards) SW3209 Counselling Theories & Practice (applicable for Cohort 2016 onwards) Note 4: Students intending to do a double major in PL and SW are advised to read PL2131 in their first year because the module serves as a gate for determining whether one could pursue a major in Psychology and also because it could be read in place of SW3101. Minor Pass at least 24 MCs of PL modules, which include the following: 1. PL1101E Introduction to Psychology 2. PL2131 Research and Statistical Methods I 3. A minimum of 16 MCs from the following: PL3232 Biological Psychology PL3233 Cognitive Psychology PL3234 Developmental Psychology PL3235 Social Psychology PL3236 Abnormal Psychology Note 1: A maximum of 8 MCs from the minor can be used to satisfy the requirements of a major or another minor. However, the credits for these modules will be counted ONCE. FASS students will still need to fulfil the MCs required for the UE outside major requirements.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Note 2: GEMs that are within the basket of modules offered by the Minor can now be used to fulfil both the minor and GEM requirements. Note 3: Students could not use modules in their Major requirements to double-count for any of the PL modules in the Minor basket. For the latest updates, please visit the department website at: http://www.fas.nus.edu.sg/psy
10.	13 Jul 2017	FASS	URL: http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/ To graduate with a BA (Hons) or BSocSci (Hons) degree, FASS students must have declared honours track* and accumulated a minimum of 160 Modular Credits (MCs) and achieved a Cumulative Average Point (CAP) of at least 3.20. Students who choose not to or do not complete the honours requirements may graduate with a BA degree, after accumulating a minimum of 120 MCs at a CAP of at least 2.00. The requirements for graduation are: 1. General Education Requirements • Students will be required to read one General Education Module (GEM) from each of the five pillars. More information can be found here. • It is compulsory for FASS students to take GET1031A to fulfil the Thinking and Expression pillar. • FASS students who are in USP or completing the UTown requirements will still need to read GET1031A and count it towards their Unrestricted Elective instead. 2. Programme Requirements which include: • Faculty Core Requirements • Major Requirements 3. Unrestricted Elective Modules
11.	17 Jul 2017	FASS	http://www.nus.edu.sg/nusbulletin/lee-kuan-yew-school-of-public-policy/graduate-education/degree-requirements/master-in-public-management/ 3.2.3 Master in Public Management

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Admission Policy For the Master in Public Management (MPM) programme, the School seeks a diverse group of candidates who hold leadership positions within their organisations and are committed to serving their community. The MPM Candidate The Admissions Committee selects candidates for this programme using a broad set of criteria. In general, the candidate should be an accomplished senior official, holding a decision-making position. He or she should be ready to contribute a unique perspective and experience to the programme to benefit other students, and be ready to contribute back to his organisation and country at the end of his or her training. The ideal candidate is a key member of the organisation and whose MPM training will be seen as vital in the organisation's next step forward. Applicants seeking admission to the course for the degree of Master in Public Management must have: • A good NUS honours degree (second class and above) or equivalent (e.g., a four-year Bachelors degree with at least an average grade of B or equivalent), and at least eight years of relevant work experience; or • A good Bachelors degree and successful completion of a placement test, and at least eight years of relevant work experience; or exceptionally Other qualifications and experience may be accepted subject to approval by the NUS Board of Graduate Studies. Requirements

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
The minimum candidature for the MPM programme is one year and the maximum is 18 months. Within that time, he or she must earn at least 44 graduate-level Modular Credits (MCs) by completing at least eight modules at NUS (of which 5 are core modules) and four modules at the Harvard Kennedy School of Government (KSG), Harvard University or School of International and Public Affairs (SIPA), Columbia University. In addition, he or she must complete an attachment programme and present a paper pertaining to the attachment at the Public Management Seminar Series.

Structure of the MPM Programme

The Programme consists of two components: an NUS component, and a specially designed programme at a partner university.

The NUS Component

MPM candidates will go through an orientation programme, one full semester and a condensed semester of coursework at the Lee Kuan Yew School of Public Policy, Singapore. Candidates will also be required to participate in an attachment programme

The Partner University Component

The programme taps into the established strengths in public policy training at a partner university, for example, the Harvard Kennedy School of Government (KSG), Harvard University or the School of International and Public Affairs (SIPA), Columbia University and complements the training provided at NUS. For this component, the MPM candidate will spend a semester at a partner university on a specially designed academic programme.

<table>
<tr><th colspan="3">National University of Singapore</th></tr>
<tr><td>Semester One</td><td>July – December</td><td>Orientation and Review Programme
4 core modules and 1 MPM elective
2 electives
Examinations and Break</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th colspan="3">Partner University</th></tr>
<tr><td>Semester Two</td><td>January – mid-May</td><td>4 electives
Examinations and Break</td></tr>
<tr><th colspan="3">National University of Singapore</th></tr>
<tr><td>Special Term</td><td>June – July</td><td>1 core module
Attachment Programme</td></tr>
</table>
</td></tr>
<tr><td>12.</td><td>24 Jul 2017</td><td>FASS</td><td>URL: http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/
The graduation requirements presented in this section are extracted from the Modular System for Cohort 2017, which contains other important information for FASS students. Students are strongly advised to print a copy of the Modular System for Cohort 2017 for their reference, available at: https://www.fas.nus.edu.sg/resources/academic-matters/modular-system.html
All important announcements will be placed at the FASS website: http://www.fas.nus.edu.sg or https://myportal.nus.edu.sg/studentportal/fas/ug/. It is, therefore, the responsibility of students to check the Faculty website and their NUS mailboxes regularly for updates. Students are also responsible for ensuring that they are contactable via their NUS mailboxes.</td></tr>
<tr><td>13.</td><td>13 Sep 2017</td><td>FASS</td><td>NUS Bulletin 2017-18 – Update submitted by FASS

Amended as shaded in yellow below:

FASS Psychology 2017

URL: http://www.nus.edu.sg/nusbulletin/faculty-of-arts-and-social-sciences/undergraduate-education/degree-requirements/department-degree-requirements/regular-programmes/psychology/

Second Major
1. Pass PL1101E Introduction to Psychology. This will be counted towards the Faculty Core or UE requirements
2. Pass at least 44 MCs of PL or PL-recognised modules which include the following:</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			PL2131 Research and Statistical Methods I PL2132 Research and Statistical Methods II PL3232 Biological Psychology PL3233 Cognitive Psychology PL3234 Developmental Psychology PL3235 Social Psychology PL3236 Abnormal Psychology PL3231 Independent Research Project OR one of the PL328x lab modules* a minimum of 12 MCs at Level-2000 and Level-3000 (excluding modules above), with a maximum of one other PL328X lab module* a maximum of 2 PL-recognised modules Note 1: Students are not allowed to read Level-4000 modules. Note 2: *As PL3231 and the PL328x lab modules serve the same purpose of strengthening the empirical research skills of students, students are only allowed to read a maximum of 2 such modules, in any of the following combinations: (1) PL3231 (2) PL328x (3) PL3231 + PL328x (4) PL328x + PL328x Note 3: Page 5 The following are PL-recognised modules: PH2201 Introduction to the Philosophy of Science PH2241 Philosophy of Mind PH3201 Philosophy of Social Science LSM3215 Neuronal Signaling and Memory Mechanisms LSM3216 Neuronal Development and Diseases SW3208 Negotiation & Conflict Resolution (applicable for Cohort 2016 onwards) SW3209 Counselling Theories & Practice (applicable for Cohort 2016 onwards)

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			MNO1706 Organisational Behaviour (applicable for Cohort 2017 onwards) ---------- FASS Psychology 2017 Minor Pass at least 24 MCs of PL modules, which include the following: 1. PL1101E Introduction to Psychology 2. PL2131 Research and Statistical Methods I 3. A minimum of 16 MCs from the following: PL3232 Biological Psychology PL3233 Cognitive Psychology PL3234 Developmental Psychology PL3235 Social Psychology PL3236 Abnormal Psychology Note 1: A maximum of 8 MCs from the minor can be used to satisfy the requirements of a major or another minor. However, the credits for these modules will be counted ONCE. FASS students will still need to fulfil the MCs required for the UE outside major requirements. Note 2: GEMs that are within the basket of modules offered by the Minor can now be used to fulfil both the minor and GEM requirements. Note 2: Students could not use modules in their Major requirements to double-count for any of the PL modules in the Minor basket.
14.	2 Feb 2018	BIZ	

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Respective programme web page</td><td>Please replace the current text at the respective programme web page with the following details indicated below:</td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.1 Master of Business Administration</td><td>
Admission Requirements

Strong academic record in undergraduate study from a reputable, degree-granting academic institution.
Minimum two years of post-university full-time work experience.
Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.
Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
Shortlisted applicants would be required to attend an interview.

Graduation Requirements
Candidates of the MBA Programme need to successfully complete 68 Modular Credits (MC) and meet a minimum Cumulative Average Points (CAP) of 3.0 to graduate. The breakdown of the core and elective MCs are as follows:
<table>
<tr><th></th><th>Module</th><th>Module Name</th><th>M</th><th>Requiremen</th><th>Remark</th></tr>
<tr><td rowspan="6">C</td><td>BMA5001</td><td>Managerial Economics</td><td>4</td><td>Required</td><td></td></tr>
<tr><td>BMA5002</td><td>Analytics for Managers</td><td>4</td><td>Required</td><td>Recommend to do prior to</td></tr>
<tr><td>BMA5003</td><td>Financial Accounting</td><td>4</td><td>Required</td><td>This is a pre-requisite module for BMA5005 & BMA5013</td></tr>
<tr><td>BMA5004</td><td>Management and</td><td>2</td><td>Required</td><td></td></tr>
<tr><td>BMA5005</td><td>Management Accounting</td><td>2</td><td>Required</td><td>Pre-requisite module: BMA5003</td></tr>
<tr><td>BMA5008</td><td>Financial Management</td><td>4</td><td>Required</td><td>This is a pre-requisite for most finance electives</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

BMA5009	Marketing Management	4	Required	This is a pre-requisite for BMA5013 & most marketing electives
BMA5010	Managing Operations	2	Required	
BMA5011	Macroeconomics in the Global Economy	4	Required	This is a pre-requisite for some related electives
BMA5013	Corporate Strategy	4	Required	Pre-requisite modules: BMA5003 & BMA5009
BMA5016	Leadership in Organisation	2	Required	
BMA5801	Management	0	Required	
BMA5901	Management Practicum	4	Required	
Total Core Requirements			**40 MCs**	
Total Elective Requirements			**28 MCs**	
Total MBA Requirements			**68 MCs**	

Individual in Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.2 The NUS – Peking University Double Degree Master of Business Administration</td><td>
Admission Requirements
• Strong academic record in undergraduate study from a reputable, degree-granting academic institution.
• Minimum two years of post-university full-time work experience.
• For candidates from China: The Common Entrance
• Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.
• Examination is required.
• Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
• Shortlisted applicants would be required to attend interviews at both universities.

*Candidates have to fulfil the admission requirements for both degree programmes to gain admission to the Double Degree Programme.

Graduation Requirements
The programme is offered in joint partnership between NUS Business School and Guanghua School of Management, Peking University. A minimum CAP of 3.0 is needed to meet the requirement to be awarded an NUS degree.

<table>
<tr><th>Code</th><th>Module Name</th><th>M</th><th>Remark</th></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>BMA5005</td><td>Management Accounting</td><td>2</td><td>Students who read Managerial Accounting elective at PKU may apply to waive this requirement.</td></tr>
<tr><td>BMA5016A</td><td>Leadership in Organisation</td><td>2</td><td>Students who read Leadership in Organization elective at PKU may apply to waive this requirement</td></tr>
<tr><td>BMA5901</td><td>Management Practicum</td><td>4</td><td>Students who has done an Integrated Practicum Project module in PKU may apply to waive this requirement</td></tr>
<tr><td>BMA5801</td><td>Management Communicatio</td><td>0</td><td>Students who read Management Communication elective at PKU may apply to waive this requirement</td></tr>
<tr><td colspan="2">Total Core</td><td>8</td><td></td></tr>
<tr><td colspan="2">Total Electives</td><td>36</td><td>Total elective MCs would depend on the core modules that are waived.</td></tr>
<tr><td colspan="2">Total Requirements for NUS</td><td>4</td><td></td></tr>
</table>

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zahira@nus.edu.sg | +65 6516 7848</td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.3 The NUS – HEC Paris Double Degree Master of Business Administration</td><td>Admission Requirements
• Strong academic record in undergraduate study from a reputable, degree-granting academic institution.
• Minimum three years of full-time post-university work experience.
• Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>

Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
Shortlisted applicants would be required to attend interviews at both universities.

*Candidates have to fulfil the admission requirements for both degree programmes to gain admission to the Double Degree Programme.

Graduation Requirements
The programme is offered in joint partnership between NUS Business School and HEC Paris, students will have the flexibility to begin the programme at HEC Paris or NUS. A minimum CAP of 3.0 is needed to meet the requirement to be awarded an NUS degree.

<u>Starting at HEC Paris:</u>
Students starting at HEC Paris are required to meet the following credit requirements at NUS:

<table>
<tr><th>Code</th><th>Module Name</th><th>MC</th><th>Remark</th></tr>
<tr><td>BMA5011</td><td>Macroeconomics</td><td>4</td><td></td></tr>
<tr><td>BMA5901</td><td>Management</td><td>4</td><td></td></tr>
<tr><td>BMA5801</td><td>Management Communication</td><td>0</td><td>Students who read Communication Management Center workshop (Act Your Success) may apply to waive this module.</td></tr>
<tr><td colspan="2">Total Core</td><td>8</td><td></td></tr>
<tr><td colspan="2">Total Electives</td><td>48</td><td></td></tr>
<tr><td colspan="2">Total Requirements for NUS</td><td>56</td><td></td></tr>
</table>

<u>Starting at NUS:</u>
Students starting at NUS will need to complete the following NUS MBA curriculum requirements at NUS:

<table>
<tr><th></th><th>Module</th><th>Module Name</th><th></th><th>Remark</th></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)					
						BMA5001	Managerial Economics	
						BMA5002	Analytics for Managers	Recommend to do prior to BMA5013
						BMA5003	Financial Accounting	This is a pre-requisite module for BMA5005 & BMA5013
						BMA5004A	Management and Organisation	
						BMA5005	Management Accounting	Pre-requisite module: BMA5003
						BMA5008	Financial Management	This is a pre-requisite for most finance electives
						BMA5009	Marketing Management	This is a pre-requisite for BMA5013 & most marketing Electives
						BMA5010A	Managing Operations	
					Core	BMA5011	Macroeconomics in the Global Economy	This is a pre-requisite for some related electives
						BMA5013	Corporate Strategy	Pre-requisite modules: BMA5003 & BMA5009
						BMA5016A	Leadership in Organisation	
						BMA5801	Management Communication	
						BMA5901	Management Practicum	
						Total Core Requirements		
						Total Elective Requirements		
						Total MBA Requirements		

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<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.4 S3 Asia MBA</td><td>
Admission Requirements

Strong academic record in undergraduate study from a reputable, degree-granting academic institution.
Minimum two years of post-university full-time work experience.
Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required for NUS and KUBS, or GRK scores for Fudan University.
Applicants whose native tongue or medium of undergraduate instruction was not English will be required to submit TOEFL/IELTS/PTE scores as evidence of their proficiency in English (NUS) or pass an English admission test (KU and FU).
Shortlisted applicants would be required to attend an interview.

Graduation Requirements
The S^3 Asia MBA programme is offered in partnership with the School of Management at Fudan University, the Korea University Business School and NUS Business School. Students will complete their programme in the following sequence: Fudan University, Korea University, and NUS.

To be awarded an NUS degree, students must meet the admission criteria of NUS, fulfill all the module & requirements of the partner universities and achieve a minimum CAP of 3.0 for modules done at NUS.
<table>
<tr><th>Code</th><th>Module Name</th><th>Remark</th></tr>
<tr><td>BMA5011</td><td>Macroeconomics</td><td></td></tr>
<tr><td>BMA5013</td><td>Corporate Strategy</td><td>Pre-requisite modules: BMA5003 & BMA5009.
Students should have
completed the equivalent modules at
Fudan University & Korea University</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>BMA5901</td><td>Management Practicum</td><td>Compulsory for students opting to graduate with an NUS MBA degree</td></tr>
<tr><td colspan="2">Total Core</td><td></td></tr>
<tr><td colspan="2">Total Electives</td><td></td></tr>
<tr><td colspan="2">Total Requirement for NUS</td><td></td></tr>
</table>
Individual In Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848</td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.5 The NUS Master of Business Administration–Master in Public Policy (with Lee Kuan Yew School of Public Policy)</td><td>Admission Requirements
• Strong academic record in undergraduate study from a reputable, degree-granting academic institution (either NUS honours degree with second class and above, or four year bachelors degree with average grade of B or equivalent).
• Minimum of two years full-time post-university work experience.
• Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.
• Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
• Shortlisted applicants would be required to attend interviews at both faculties.

*Candidates have to fulfil the admission requirements for both degree programmes to gain admission to the Double Degree Programme.

Graduation Requirements
The NUS MBA double degree in Master in Public Policy (MPP) programmes is offered jointly with the Lee Kuan Yew School of Public Policy (LKYSPP).</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
					Modules required for the MBA-MPP programme is indicated in the tables below, and students must obtain a minimum CAP of 3.0 to be awarded the Double Degree.

		No MPP Specialization	With MPP Specialization
Module	**Module Name**	**M**	**M**
BMA	Analytics for Managers	4	4
BMA	Financial Accounting	4	4
BMA	Management and Organisation	2	2
BMA	Management Accounting	2	2
BMA	Financial Management	4	4
BMA	Marketing Management	4	4
BMA	Managing Operations	2	2
BMA	Macroeconomics	4	4
BMA	Corporate Strategy	4	4
BMA	Leadership in Organisation	2	2
BMA	Management Communication	0	0
BMA	Management Practicum	4	4
Total MBA Core		**3**	**36**
Total MBA Electives		**1**	**16**
Total MBA Requirement		**5**	**52**
PP540	Policy Challenges	4	4
PP540	Policy Institution and Processes	2	2
PP540	Economic Foundations for Public Policy	4	4
PP540	Public Administration & Politics	2	2
PP540	Quantitative Research Method for Public Policy I	4	4
PP540	Quantitative Research Method for Public Policy II	4	4
PP540	Qualitative Research Method for Public Policy	4	4
PP511	Policy Analysis Exercise	4	4
Total MPP Core		**2**	**28**
	Specialization Electives	0	20
	Public Policy Electives	1	0
	Free Electives	8	4

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Total MPP Electives</td><td>2</td><td>24</td></tr>
<tr><td>Total MPP Requirement</td><td>5</td><td>52</td></tr>
<tr><td>Total MBA-MPP Double Degree Graduate</td><td>1</td><td>104</td></tr>
</table>

Individual In Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848</td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.6 The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy)</td><td>
Admission Requirements
• Strong academic record in undergraduate study from a reputable, degree-granting academic institution (either NUS honours degree with second class and above, or four year bachelors degree with average grade of B or equivalent).
• Minimum of five years full-time post-university work experience.
• Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.
• Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
• Shortlisted applicants would be required to attend interviews at both faculties.

*Candidates have to fulfil the admission requirements for both degree programmes to gain admission to the Double Degree Programme.

Graduation Requirements
The NUS MBA double degree in Master in Public Administration (MPA) is offered jointly with the Lee Kuan Yew School of Public Policy (LKYSPP).

Modules required for the MBA-MPA programmes are indicated in the tables below, and students must obtain a minimum CAP of 3.0 to be awarded the Double Degree.

<table>
<tr><th></th><th></th><th>Module Code</th><th>Module Name</th><th>M</th></tr>
<tr><td></td><td></td><td>BMA5002</td><td>Analytics for Managers</td><td>4</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		

MBA Modules	**Core**	BMA5003	Financial Accounting	4
		BMA5004A	Management and Organisation	2
		BMA5005	Management Accounting	2
		BMA5008	Financial Management	4
		BMA5009	Marketing Management	4
		BMA5010A	Managing Operations	2
		BMA5011	Macroeconomics	4
		BMA5013	Corporate Strategy	4
		BMA5016A	Leadership in Organisation	2
		BMA5801	Management Communication	0
		BMA5901	Management Practicum	4
		Total MBA Core		**3**
		Total MBA Electives		**2**
		Total MBA Requirement		**5**
MPA Modules	**Core**	PP5801	Economic Analysis	4
		PP5802	Policy Analysis	4
		PP5803	Public Management	4
		PP5804	The Governance Study Project	4
		Total MPA Core		**1**
		Total MPA Electives		**1**
		Total MPA Requirement		**3**
		Total MBA-MPA Double Degree Graduate Requirement		**8**

Individual In Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848

4.2.2.7 The NUS Master of Business	**Admission Requirements**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Administration–Master of Advanced Management Double Degree (with Yale School of Management)</td><td>

Candidates apply for the program during their first year into the Master of Business Administration programme
Candidate must meet the admission requirements of The NUS MBA, and successfully completed at least 44 modular credits (including all core modules of The NUS MBA) before being recommended into the Yale MAM programme.
In addition, candidates seeking admission to MAM have to undergo an additional admission process by Yale School of Management.

Graduation Requirements
The NUS MBA – Yale MAM double degree is offered as part of the tie-up with Yale University's School of Management (SOM). This programme is open only to current students & recent MBA graduates of schools that are part of the Global Network for Advanced Management (GNAM). Students may indicate their interest in Yale MAM at the time of admission or midway through The NUS MBA, and must complete at least 44 MCs and a CAP of above 3.0 before being recommended into the Yale MAM programme. The curriculum requirement for the NUS MBA portion of this double degree programme is indicated in the table below.
<table>
<tr><th></th><th>Module</th><th>Module Name</th><th>M</th><th>Remark</th></tr>
<tr><td rowspan="8">Core</td><td>BMA5001</td><td>Managerial Economics</td><td>4</td><td></td></tr>
<tr><td>BMA5002</td><td>Analytics for Managers</td><td>4</td><td>Recommend to do prior to BMA5013</td></tr>
<tr><td>BMA5003</td><td>Financial Accounting</td><td>4</td><td>This is a pre-requisite module for BMA5005 & BMA5013</td></tr>
<tr><td>BMA5004</td><td>Management and Organisation</td><td>2</td><td></td></tr>
<tr><td>BMA5005</td><td>Management Accounting</td><td>2</td><td>Pre-requisite module: BMA5003</td></tr>
<tr><td>BMA5008</td><td>Financial Management</td><td>4</td><td>This is a pre-requisite for most finance electives</td></tr>
<tr><td>BMA5009</td><td>Marketing Management</td><td>4</td><td>This is a pre-requisite for BMA5013 & most marketing electives</td></tr>
<tr><td>BMA5010</td><td>Managing Operations</td><td>2</td><td></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="4">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td colspan="2">
<table>
<tr><td>BMA5011</td><td>Macroeconomics in the Global Economy</td><td>4</td><td>This is a pre-requisite for some related electives</td></tr>
<tr><td>BMA5013</td><td>Corporate Strategy</td><td>4</td><td>Pre-requisite modules: BMA5003 & BMA5009</td></tr>
<tr><td>BMA5016</td><td>Leadership in Organisation</td><td>2</td><td></td></tr>
<tr><td>BMA5801</td><td>Management Communication</td><td>0</td><td></td></tr>
<tr><td>BMA5901</td><td>Management Practicum</td><td>4</td><td></td></tr>
<tr><td colspan="2">Total Core Requirements</td><td>40</td><td></td></tr>
<tr><td colspan="2">Total Elective Requirements</td><td>4</td><td></td></tr>
<tr><td colspan="2">Total MBA Requirements</td><td>44</td><td></td></tr>
</table>
Individual In Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848</td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.8 The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme</td><td colspan="2">Admission Requirements
Strong academic record in undergraduate study from a reputable, degree-granting academic institution.
Minimum two years of post-university full-time work experience.
Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.
Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
Shortlisted applicants would be required to attend an interview.</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	

Graduation Requirements

The NUS MBA-MRE Double Degree Programme is offered in collaboration with the NUS School of Design & Environment (Department of Real Estate).

Modules required for the MBA-MRE programmes are indicated in the tables below, and students must obtain a minimum CAP of 3.0 to be awarded the Double Degree.

Module Code	Module Name	MC	
BMA5001	Managerial Economics	4	
BMA5002	Analytics for Managers	4	Recommend to do prior to BMA5013
BMA5003	Financial Accounting	4	This is a pre-requisite module for BMA5005 & BMA5013
BMA5004A	Management & Organization	2	
BMA5005	Management Accounting	2	Pre-requisite module: BMA5003
BMA5008	Financial Management	4	This is a pre-requisite for most finance electives
BMA5009	Marketing Management	4	This is a pre-requisite for BMA5013 & most marketing electives
BMA5010A	Managing Operations	2	
BMA5013	Corporate strategy	4	Pre-requisite modules: BMA5003 & BMA5009
BMA5016A	Leadership in Organization	2	
BMA5801	Management Communication	0	
Total MBA Core		**3**	
Total MBA Electives		**1**	
Total MBA Requirement		**5**	
RE5001	Real Estate Development	4	
RE5003	Real Estate Investment	4	
RE5004	Real Estate Economics	4	

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>RE5013</td><td>Urban Policy & Real Estate</td><td>4</td><td></td></tr>
<tr><td>RE5017</td><td>Real Estate Case Study</td><td>4</td><td></td></tr>
<tr><td colspan="2">Total RE Core</td><td>2</td><td></td></tr>
<tr><td colspan="2">Total MRE Electives</td><td>1</td><td></td></tr>
<tr><td colspan="2">Total MBA-MRE Double Degree Requirement</td><td>8</td><td></td></tr>
</table>

Individual In Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848</td></tr>
<tr><td></td><td></td><td></td><td></td><td>4.2.2.9 PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering)</td><td>Admission Requirements
• Strong academic record in in any scientific, engineering or IT discipline during undergraduate study and/or postgraduate studies from a reputable, degree-granting academic institution.
• Minimum two years of post-university full-time work experience preferred but not required.
• While candidates to this programme may have less work experience, more attention will be paid to one’s research experience, startup and industry experience, completed internships, interest in and involvement in entrepreneurship and business
• Good analytical writing assessment, verbal, quantitative and total scores for the Graduate Management Admissions Test (GMAT) are required.
• Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
• Shortlisted applicants will be required to attend an interview by all three faculties.

Graduation Requirements
The NUS PhD-MBA concurrent degree is jointly hosted by the NUS Graduate School for Integrative Sciences and Engineering and the NUS Business School.

The MBA requirements for the programme are indicated in the table below. Please note that students must maintain a minimum CAP of 3.8 for continuation of study on this programme. Additionally, note that student would not be allowed to graduate with only MBA.</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

	Module Code	Module Name	M	Remark
Core	BMA5001	Managerial Economics	4	
	BMA5002	Analytics for Managers	4	Recommend to do prior to BMA5013
	BMA5003	Financial Accounting	4	This is a pre-requisite module for BMA5005 & BMA5013
	BMA5004A	Management and Organisation	2	
	BMA5005	Management Accounting	2	Pre-requisite module: BMA5003
	BMA5008	Financial Management	4	This is a pre-requisite for most finance electives
	BMA5009	Marketing Management	4	This is a pre-requisite for BMA5013 & most marketing electives
	BMA5010A	Managing Operations	2	
	BMA5011	Macroeconomics in the Global	4	This is a pre-requisite for some related electives
	BMA5013	Corporate Strategy	4	Pre-requisite modules: BMA5003 & BMA5009
	BMA5016A	Leadership in Organisation	2	
	BMA5801	Management Communication	0	
	BMA5901	Management Practicum	4	
Mod	**Total Core Requirements**		**40**	
	Total Elective Requirements		**20**	
	Total MBA Requirements		**60**	

Individual In Charge
Zahira Nawi
Head of MBA Programme Management
zahira@nus.edu.sg | +65 6516 7848

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
				4.2.2.10 The NUS Executive MBA (English)	**Admission Requirements** • Strong academic record in undergraduate study from a reputable, degree-granting academic institution. • Minimum of ten years' full-time postgraduate work experience. • Holds senior position or has the potential to assume senior managerial positions in the near future. • Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English. • A good GMAT score may be required on a case-by-case basis. **Graduation Requirements** The NUS Executive MBA (EMBA) is a graduate programme leading to the conferment of the degree of *Master of Business Administration.* Candidates are required to attain **72 modular credits** towards the completion of the programme & the CAP 3 and above. **Individual In Charge** Wendy Lee Head of EMBA Programme Management wendylmf@nus.edu.sg | +65 6516 1265
				4.2.2.11 The NUS Executive MBA (Chinese)	**Admission Requirements** • Strong academic record in undergraduate study from a reputable, degree-granting academic institution. • Minimum of eight years' full-time postgraduate work experience • Holds senior position or has the potential to assume senior managerial positions in the near future. • Conversant and literate in the Chinese Language. **Graduation Requirements** The NUS Executive MBA (Chinese) is a graduate programme leading to the conferment of the degree of *Master of Business Administration.* Candidates are required to attain **72 modular credits** towards the completion of the programme & the CAP 3 and above.

Modules of Study	Credits
BMC5001A Leadership	3
BMC5001B Managerial Skills	3
BMC5002A Corporate Strategy	3
BMC5002B Contemporary Issues in Strategy	3
BMC5003A Decision Making	3
BMC5003B Information Management	3
BMC5004A Managerial Economics	3
BMC5004B Asian Markets and Industries	3
BMC5005A International Business	3
BMC5005B International Business Law	3
BMC5006A Marketing Management	3
BMC5006B Contemporary Issues in Marketing	3
BMC5007A Accounting	3
BMC5007B Financial Management	3
BMC5008A Organizational Behavior and Human Resource Management	3
BMC5008B Contemporary Issues in HRM and OB	3
BMC5009A Systems & Operations Management	3
BMC5009B Supply Chain Management	3
BMC5010A Corporate Finance	3
BMC5010B Corporate Governance	3
BMC5011A Contemporary Issues in Business 1	3
BMC5011B Contemporary Issues in Business 2	3
BMC5012 Advanced Study Project	6
TOTAL	**72**

Individual In Charge
Brenda Cao
Head of EMBA Programme Management
brendacao@nus.edu.sg | +65 6516 5271

4.2.2.12 UCLA – NUS Executive MBA

Admission Requirements

- Strong academic record in undergraduate study from a reputable, degree-granting academic institution, and a scholastic average of B or better in the last two years of undergraduate coursework and in any post-baccalaureate study. Applicants are expected to hold a degree

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
representing completion of at least four years of study with above average scholarship from a university or university-level institution.
• Minimum of ten years' full-time postgraduate work experience
• Holds senior position or has the potential to assume senior managerial positions in the near future.
• Test of English as a Foreign Language (TOEFL) or International English Language Testing (IELTS) or Pearson Test of English (PTE) is required if the medium of instruction during undergraduate studies was not in English.
• A good GMAT score may be required on a case-by-case basis.
• Shortlisted applicants would be required to attend interviews at both universities.
*Candidates have to fulfil the admission requirements for both degree programmes to gain admission to the Double Degree Programme.

Graduation Requirements
The UCLA – NUS Executive MBA (EMBA) is a graduate program, leading to the award of the degree of "Master of Business Administration" by NUS, and a separate degree of "Master of Business Administration" awarded by UCLA.

Each degree requires satisfactory completion of the degree requirements at each institution. Candidates will complete 36 credits in residence at NUS & the CAP 3 and above, and 36 credits in residence at UCLA.

<table>
<tr><th>Modules of Study</th><th>Credits</th></tr>
<tr><td><u>NUS Modules</u></td><td></td></tr>
<tr><td>BMU5001 Leadership & Managerial Skills</td><td>4</td></tr>
<tr><td>BMU5003 Economic Analysis for Managers</td><td>4</td></tr>
<tr><td>BMU5004 Macroeconomics & International Finance</td><td>4</td></tr>
<tr><td>BMU5006 Marketing Strategy</td><td>4</td></tr>
<tr><td>BMU5007 Corporate Finance</td><td>4</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

BMU5008 Corporate Governance, Business Law & Ethics	4
BMU5014 Contemporary Issues in Business (Services Management)	4
BMU5015 Competitive Strategy & Business Policy	4
BMU5017 Management Practicum**	4
UCLA Modules	
MGMT483 Management of Technology & Innovation	4
MGMT463 Data Analysis & Management Decisions	4
MGMT464 Financial Accounting	4
MGMT474 Logistics & Operations Management	4
MGMT482 Negotiations Behavior	4
MGMT487B Entrepreneurship & Venture Initiation	4
MGMT471A Management Practicum**	4
MGMT486 Strategic Leadership & Strategy Implementation	4
Two 2-unit electives	4
TOTAL	**72**

** Management Practicum is an eight-credit module which is co-taught by NUS and UCLA faculty members.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
					Individual In Charge Wendy Lee Head of EMBA Programme Management wendylmf@nus.edu.sg | +65 6516 1265
				4.2.2.13 Master of Science (Management) with CEMS Master's in International Management Double Degree	**Admission Requirements** • A good undergraduate degree from a four-year Business or related degree programme. A good three-year Business or related degree with very good academic results may also be considered on a case-by-case basis. • Good TOEFL or IELTS scores if English is not the mother tongue or medium of prior undergraduate instruction. • No work experience is required. • Interviews will be conducted for shortlisted candidates. • Besides good oral and written skills in English, applicants for the double-master programme with CEMS must be proficient in at least one other CEMS language. • GMAT is not mandatory, but candidates with good GMAT scores will be considered favourably for CEMS study awards, and also stand a higher change in getting their preferred placement in CEMS host **Graduation Requirements** In order to graduate, student must fulfilled requirements for both Master of Science (Management) and CEMS MIM. (a) Master of Science (Management) Student must complete a minimum of 40 MCs of business modules, and maintain an overall CAP of at least 3.0 for Master of Science (Management). (b) CEMS Master's in International Management Student must have successfully completed all obligatory components for the CEMS MIM. **Individual In Charge** Aaron Goh Director, MSc & CEMS

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
					aaron.goh@nus.edu.sg | +65 6601 6231
				4.2.2.14 Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and the NUS Business School)	**Admission Requirements** • Strong academic record in undergraduate study from a reputable, degree-granting academic institution. • Minimum five years of full-time work experience. • Currently working in the Government Sector or State Owned Enterprises. Referred by Organisation / Unit to the MPAM programme. • Holds senior position or has the potential to assume senior managerial positions in the near future. • Conversant and literate in the Chinese Language. **Graduation Requirements** Candidates are required to attain **40 modular credits** towards the completion of the programme & the CAP 3.0 and above. **Individual In Charge** Brenda Cao Head of EMBA Programme Management brendacao@nus.edu.sg | +65 6516 5271

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
15.	12 Sep 2017	SoC	NUS Bulletin 2017-18 Updates (dated 5 Sep 2017) 3.2.9 Bachelor of Computing in Information Security http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-security-2/ Update 1: Amended as indicated in red: 1. PROGRAMME REQUIREMENTS (Total of 108 MCs) Computing Foundation (36 MCs) CS1010 Programming Methodology3 CS1231 Discrete Structures CS2040C Data Structures and Algorithms CS2100 Computer Organisation CS2102 Database Systems CS2105 Introduction to Computer Networks CS2106 Introduction to Operating Systems CS2113T Software Engineering & Object-Oriented Programming4 IS3103 Information Systems Leadership and Communication Information Security Requirements (32 MCs) CS2107 Introduction to Information Security CS3235 Introduction to Computer Security CS3205IFS4205 Information Security Capstone Project IS4231 Information Security Management Complete 12 MCs from the following list of modules: CS3236 Introduction to Information Theory either CS4236 Cryptography Theory and Practice or MA4261 Coding and Cryptography

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			CS4238 Computer Security Practices CS4239 Software Security CS5231 Systems Security CS5321 Network Security CS5322 Database Security CS5331 Web Security CS5332 Biometric Authentication IFS4101 Legal Aspects of Information Security IFS4102 Digital Forensics IS4204 IT Governance IS4232 Topics in Information Security Management IS4233 Legal Aspects of Information Technology IS4234 Control and Audit of IS IS4302 Blockchain and Distributed Ledger Technologies Other modules approved by the SoC UG Office Computing Breadth (8 MCs) Complete 8 MCs of CP-coded, CS-coded or IS-coded modules at level-3000 or above. Industrial Experience Requirement IT Professionalism (8 MCs) IS1103/X IS Innovations in Organisations and Society CS2101 Effective Communication for Computing Professionals Mathematics (12 MCs) MA1101R Linear Algebra I MA1521 Calculus for Computing ST2334 Probability and Statistics4 Update 2: Amended module code CS3205 to IFS4205 NUS Overseas Colleges (NOC) – Information Security Students who attended NOC programme may: 1. count TR3201 Entrepreneurship Practicum (8 MCs) towards Computing Breadth. 2. count TR3202 Start-up Internship Programme (12 MCs) towards Industrial Experience Requirement.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			3. count TR3203 Start-up Case Study and Analysis towards Unrestricted Electives. Students working on information security-related projects for TR3203 may seek approval to instead take TR3203P, which counts towards CS3205 IFS4205 Information Security Capstone Project requirement. Update 3: Amended as indicated in red: University Scholars Programme (Information Security) Students in the University Scholars Programme who choose the Bachelor of Computing (Information Security) major will take the Information Security programme, but with the following variations: 1. They will read GER1000 Quantitative Reasoning (4 MCs) as compulsory module for the University Level Requirements (ULR). The remaining 16 MCs in ULR are replaced by the 3 USP Inquiry Modules and 1 USP Foundation module (i.e. 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. They will read CS3205 IFS4205 Information Security Capstone Project, which is an 8-MCs 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, including CS3205) and the USP Reflection module (the Senior Seminar). They will have 16 MCs under the Unrestricted Electives. Update 4: Amended as indicated in red: Table 4: Summary of degree requirements for Bachelor of Computing (Information Security) **MODULES** | **MCS** | **SUBTOTALS** **UNIVERSITY LEVEL REQUIREMENTS** | **20**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			PROGRAMME REQUIREMENTS	**108**
			Computing Foundation	**36**
			CS1010 Programming Methodology [4]	4
			CS1231 Discrete Structures	4
			CS2040 Data Structures and Algorithms	4
			CS2100 Computer Organisation	4
			CS2102 Database Systems	4
			CS2105 Introduction to Computer Networks	4
			CS2106 Introduction to Operating Systems	4
			CS2113T Software Engineering and Object-Oriented Programming [4]	4
			IS3103 Information Systems Leadership and Communication	4
			Information Security Requirements	**32**
			CS2107 Introduction to Information Security	4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			~~CS3205~~ IF4205 Information Security Capstone Project	8
			CS3235 Introduction to Computer Security	4
			IS4231 Information Security Management	4
			Programme Electives Complete 12 MCs from the following list of modules: CS3236 Introduction to Information Theory CS4236 Cryptography Theory and Practice or MA4261 Coding and Cryptography CS4238 Computer Security Practices CS4239 Software Security CS5231 Systems Security CS5321 Network Security CS5322 Database Security CS5331 Web Security CS5332 Biometric Authentication IS4204 IT Governance IFS4101 Legal Aspects of Information Security IFS4102 Digital Forensics ~~IS4232 Topics in Information Security Management~~ IS4233 Legal Aspects of Information Technology IS4234 Control and Audit of Information Systems IS4302 Blockchain and Distributed Ledger Technologies Other modules approved by the SoC UG Office	12
			Computing Breadth	**20**
			Complete 8 MCs of CP-coded, CS-coded or IS-coded modules at level-3000 or above.	8

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Industrial Experience Requirement 12 **IT Professionalism** **8** IS1103/X IS Innovations in Organisation and Society 4 CS2101 Effective Communication for Computing Professionals 4 **Mathematics** **12** MA1101R Linear Algebra I 4 MA1521 Calculus for Computing 4 ST2334 Probability and Statistics[5] 4 **UNRESTRICTED ELECTIVES**[6] **32** **Grand Total** **160** 1 Students should consult the CS Deputy Head (CS Programmes) in advance if they are interested in this option as industry courses may not be offered every year. 2 For students who opt for iLead or NOC, the additional MCs beyond the 12-MCs allocated to Industry Experience Requirement should be taken from Unrestricted Electives and/or exempted modules. 3 CS1010 can be replaced by CS1101S Programming Methodology. 4 Students taking CS2113T Software Engineering & Object-Oriented Programming must take CS2101 Effective

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Communication for Computing Professionals in the same semester. 5 Students who are pursuing either a Double Degree with Mathematics/Applied Mathematics, Second Major in Mathematics or Second Major in Statistics, can replace ST2334 with ST2131 and ST2132. The additional 4 MCs will be taken from the Unrestricted Electives space. 6 Students without A-level Mathematics are required to complete MA1301 or MA1301X Introductory Mathematics as part of the Unrestricted Electives. 3.2.10 Bachelor of Computing in Information Security – Co-operative Education Programme http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-security-coop/ Update 1: Amended as indicated red. 1. PROGRAMME REQUIREMENTS (Total of 108 MCs) Computing Foundation (36 MCs) CS1010 Programming Methodology3 CS1231 Discrete Structures CS2040C Data Structures and Algorithms CS2100 Computer Organisation CS2102 Database Systems CS2105 Introduction to Computer Networks CS2106 Introduction to Operating Systems CS2113T Software Engineering & Object-Oriented Programming4 IS3103 Information Systems Leadership and Communication Information Security Requirements (32 MCs) CS2107 Introduction to Information Security CS3235 Introduction to Computer Security IF3201 Information Security Capstone Project (Part of Internship III) IFS4201 Information Security Industry Capstone Project (Part of Internship III) IS4231 Information Security Management Complete 12 MCs from the following list of modules: CS3236 Introduction to Information Theory either CS4236 Cryptography Theory and Practice

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			or MA4261 Coding and Cryptography CS4238 Computer Security Practices CS4239 Software Security CS5231 Systems Security CS5321 Network Security CS5322 Database Security CS5331 Web Security CS5332 Biometric Authentication IFS4101 Legal Aspects of Information Security IFS4102 Digital Forensics IS4204 IT Governance IS4232 Topics in Information Security Management IS4233 Legal Aspects of Information Technology IS4234 Control and Audit of IS IS4302 Blockchain and Distributed Ledger Technologies Other modules approved by the SoC UG Office Computing Breadth (20 MCs) Complete 8 MCs of CP-coded, CS-coded or IS-coded modules at level-3000 or above. Industrial Experience Requirement CP3880 Advanced Technology Attachment Programme (Internship II) IT Professionalism (8 MCs) IS1103/X IS Innovations in Organisations and Society CS2101 Effective Communication for Computing Professionals Mathematics and Sciences (12 MCs) MA1101R Linear Algebra I MA1521 Calculus for Computing ST2334 Probability and Statistics4 Co-operative Scheme Additional Requirements (12 MCs) IFS2200 Information Security Immersion Programme (Internship I) IFS3202 IFS4202 Information Security Practicum Porgramme Programme (Part of Internship III) Update 2: Ameded as indicated in red. University Scholars Programme (Information Security)

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
Students in the University Scholars Programme who choose the Bachelor of Computing (Information Security) major will take the Information Security programme, but with the following variations:

1. They will read GER1000 Quantitative Reasoning (4 MCs) as compulsory module for the University Level Requirements (ULR). The remaining 16 MCs in ULR are replaced by the 3 USP Inquiry Modules and 1 USP Foundation module (i.e. 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. They will read IFSS3201 IFS4201 Information Security Industry Capstone Project, which is an 8-MCs independent study modules (ISMs) which will be counted as 2 USP Inquiry modules in Sciences and Technologies Basket.
4. They will use the 16 out of 20 MCs under the Unrestricted Electives to partially fulfil the remaining USP requirements.

Update 3: Amended as indicated in red:

Table 5: Summary of degree requirements for Bachelor of Computing (Information Security) – Co-operative Education Programme
<table>
<tr><th>MODULES</th><th>MCS</th><th>SUBTOTALS</th></tr>
<tr><td>UNIVERSITY LEVEL REQUIREMENTS</td><td></td><td>20</td></tr>
<tr><td>PROGRAMME REQUIREMENTS</td><td></td><td>108</td></tr>
<tr><td>Computing Foundation</td><td>36</td><td></td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			CS1010 Programming Methodology [4]	4
			CS1231 Discrete Structures	4
			CS2040C Data Structures and Algorithms	4
			CS2100 Computer Organisation	4
			CS2102 Database Systems	4
			CS2105 Introduction to Computer Networks	4
			CS2106 Introduction to Operating Systems	4
			CS2113T Software Engineering and Object-Oriented Programming [4]	4
			IS3103 Information Systems Leadership and Communication	4
			Information Security Requirements	**32**
			CS2107 Introduction to Information Security	4
			CS3235 Introduction to Computer Security	4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			~~IFS3201~~ IFS4201 Information Security Industry Capstone Project	8
			IS4231 Information Security Management	4
			Programme Electives Complete 12 MCs from the following list of modules: CS3236 Introduction to Information Theory CS4236 Cryptography Theory and Practice or MA4261 Coding and Cryptography CS4238 Computer Security Practices CS4239 Software Security CS5231 Systems Security CS5321 Network Security CS5322 Database Security CS5331 Web SecurityIS4204 IT Governance CS5332 Biometric Authentication IFS4101 Legal Aspects of Information Security IFS4102 Digital Forensics ~~IS4232 Topics in Information Security Management~~ IS4233 Legal Aspects of Information Technology IS4234 Control and Audit of Information Systems IS4302 Blockchain and Distributed Ledger Technologies Other modules approved by the SoC UG Office	12
			Computing Breadth	**20**
			Complete 8 MCs of CP-coded, CS-coded or IS-coded modules at level-3000 or above.	8
			Industrial Experience Requirement comprising of: IFS2200 Information Security Immersion Programme IFS4202 Information Security Practicum Programme	12

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			IT Professionalism **8** IS1103/X IS Innovations in Organisation and Society 4 CS2101 Effective Communication for Computing Professionals 4 **Mathematics** **12** MA1101R Linear Algebra I 4 MA1521 Calculus for Computing 4 ST2334 Probability and Statistics[5] 4 **UNRESTRICTED ELECTIVES**[6] **32** **Grand Total** **160** 1 Students should consult the CS Deputy Head (CS Programmes) in advance if they are interested in this option as industry courses may not be offered every year. 2 For students who opt for iLead or NOC, the additional MCs beyond the 12-MCs allocated to Industry Experience Requirement should be taken from Unrestricted Electives and/or exempted modules. 3 CS1010 can be replaced by CS1101S Programming Methodology. 4 Students taking CS2113T Software Engineering & Object-Oriented Programming must take CS2101 Effective Communication for Computing Professionals in the same semester. 5 Students who are pursuing either a Double Degree with Mathematics/Applied Mathematics, Second Major in

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Mathematics or Second Major in Statistics, can replace ST2334 with ST2131 and ST2132. The additional 4 MCs will be taken from the Unrestricted Electives space. 6 Students without A-level Mathematics are required to complete MA1301 or MA1301X Introductory Mathematics as part of the Unrestricted Electives.
16.	19 Oct 2017	SoC	NUS Bulletin 2017-18 Updates (dated 19 Oct 2017) 3.2.6 Bachelor of Computing in Computer Science http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-computer-science/ Update 1: Please amend the footnotes 5, 7 and 8 as follows: From: 5 Students in the Department of Computer Science who aim for Honours (High Distinction) must pass the CP4101 BComp Dissertation. Students with CAP of 4.00 or higher at the end of their fifth semester of undergraduate study may opt to replace the Industry Experience Requirement by CP4101 BComp Dissertation (12 MCs). 7 Students pursuing a double degree in Computer Science and Mathematics/Applied Mathematics or Second Major in Mathematics/Statistics will take ST2131 Probability and ST2132 Mathematical Statistics in place of ST2334 Probability and Statistics. 8 Students who have not taken 'A'-level / H2 Physics must take either PC1221/X or PC1222/X to meet the Science module requirement. Students who have not taken 'O'-level Physics may take a Life-Science module. Otherwise, students (who have taken 'A'-level / H2 Physics) may take either a Physics, Chemistry or Life-Science or Mathematics module as a Science module. The Science module must be a module from List S1 (recommended) or List S2. Please refer to: http://www.comp.nus.edu.sg/undergraduates/documents/Sciencemodules_S1_S2.pdf for details to:

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			5 Students in the Department of Computer Science who aim for Honours (Highest Distinction) must pass the CP4101 BComp Dissertation. Students with CAP of 4.00 or higher after completing at least 70% (i.e. 112 MCs) of the MC requirement for the degree programme may opt to replace the Industry Experience Requirement by CP4101 B.Comp Dissertation (12 MCs). Note that the CP4101 project selection process takes place one semester ahead of the semester in which the students commence CP4101. Thus the students can tentatively select CP4101 projects; but the condition "CAP of 4.00 or higher after completing at least 70% (112 MCs) of the MC requirement for the degree programme" must be satisfied before they can commence CP4101 in lieu of Industry Experience Requirement. 7 Students pursuing a double degree in Computer Science and Mathematics/Applied Mathematics or Second Major in Mathematics will take ST2131 Probability and ST2132 Mathematical Statistics in place of ST2334 Probability and Statistics. Students pursuing a Second Major in Statistics will take ST2131 in place of ST2334. 8 Students pursuing Second Major in Mathematics can count ST2132 towards Science Module requirements. Students cannot use ST2132 to meet the requirements of Second Major in Mathematics and have to choose another elective from List II of the Mathematics major. If a student has already taken ST2131 and later quits from the Second Major in Statistics programme, he/she will have to take ST2132 to fulfil the BComp (CS) degree requirements. For all other students: a student who have not taken 'O'-level Physics, may take a Life-Science module to meet this requirement; A student who have 'O'-level Physics but have not taken 'A'-level / H2 Physics must take either PC1221/X or PC1222/X to meet the Science module requirement; A student who have taken 'A'-level / H2 Physics may take either a Physics, Chemistry, Life-Science, Statistics, or Mathematics module as a Science module. The Science module must be a module from List S1 (recommended) or List S2. Please refer to: http://www.comp.nus.edu.sg/undergraduates/documents/Sciencemodules_S1_S2.pdf for details 3.2.7 Bachelor of Computing in Computer Science – von Neumann Programme http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-computer-science-von-neumann-programme/ Update 1: Footnotes 3, 4 and 5 are amended as follows: From: 3 Students in the Department of Computer Science who aim for Honours (Highest Distinction) must pass the CP4101 B.Comp. Dissertation. Students with CAP of 4.00 or higher at the end of their fifth semester of undergraduate study may opt to replace the Industry Experience Requirement by B.Comp Dissertation (12 MCs). 4 Students pursuing a double degree in Computer Science and Mathematics/Applied Mathematics are recommended to replace MA1521 Calculus for Computing by MA1102R Calculus.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			5 Students who have not taken 'A'-level / H2 Physics must take either PC1221/X or PC1222/X to meet the Science module requirement. Students who have not taken 'O'-level Physics may take a Life-Science module. Otherwise, students (who have taken 'A'-level / H2 Physics) may take either a Physics, Chemistry, Life-Science or Mathematics module as a Science module. The Science module must be a module from List S1 (recommended) or List S2. Please refer to: http://www.comp.nus.edu.sg/undergraduates/documents/Sciencemodules_S1_S2.pdf for details. To: 3 Students in the Department of Computer Science who aim for Honours (Highest Distinction) must pass the CP4101 BComp Dissertation. Students with CAP of 4.00 or higher after completing at least 70% (i.e. 112 MCs) of the MC requirement for the degree programme may opt to replace the Industry Experience Requirement by CP4101 B.Comp Dissertation (12 MCs). Note that the CP4101 project selection process takes place one semester ahead of the semester in which the students commence CP4101. Thus the students can tentatively select CP4101 projects; but the condition "CAP of 4.00 or higher after completing at least 70% (112 MCs) of the MC requirement for the degree programme" must be satisfied before they can commence CP4101 in lieu of Industry Experience Requirement. 4 Students pursuing a double degree in Computer Science and Mathematics/Applied Mathematics or Second Major in Mathematics will take ST2131 Probability and ST2132 Mathematical Statistics in place of ST2334 Probability and Statistics. Students pursuing a Second Major in Statistics will take ST2131 in place of ST2334. 5 Students pursuing Second Major in Mathematics can count ST2132 towards Science Module requirements. Students cannot use ST2132 to meet the requirements of Second Major in Mathematics and have to choose another elective from List II of the Mathematics major. If a student has already taken ST2131 and later quits from the Second Major in Statistics programme, he/she will have to take ST2132 to fulfil the BComp (CS) degree requirements. For all other students: a student who have not taken 'O'-level Physics, may take a Life-Science module to meet this requirement; A student who have 'O'-level Physics but have not taken 'A'-level / H2 Physics must take either PC1221/X or PC1222/X to meet the Science module requirement; A student who have taken 'A'-level / H2 Physics may take either a Physics, Chemistry, Life-Science, Statistics, or Mathematics module as a Science module. The Science module must be a module from List S1 (recommended) or List S2. Please refer to: http://www.comp.nus.edu.sg/undergraduates/documents/Sciencemodules_S1_S2.pdf for details. 3.2.8 Bachelor of Computing in Computer Science – Turing Programme

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-computer-science-turing-programme/ Update 1: Footnotes 4 and 5 are amended as follows: From: 4 Students pursuing a double degree in Computer Science and Mathematics/Applied Mathematics are recommended to replace MA1521 Calculus for Computing by MA1102R Calculus. 5 Students who have not taken 'A'-level / H2 Physics must take either PC1221/X or PC1222/X to meet the Science module requirement. Students who have not taken 'O'-level Physics may take a Life-Science module. Otherwise, students (who have taken 'A'-level / H2 Physics) may take either a Physics, Chemistry, Life-Science or Mathematics module as a Science module. The Science module must be a module from List S1 (recommended) or List S2. Please refer to: http://www.comp.nus.edu.sg/undergraduates/documents/Sciencemodules_S1_S2.pdf for details. To: 4 Students pursuing a double degree in Computer Science and Mathematics/Applied Mathematics or Second Major in Mathematics will take ST2131 Probability and ST2132 Mathematical Statistics in place of ST2334 Probability and Statistics. Students pursuing a Second Major in Statistics will take ST2131 in place of ST2334. 5 Students pursuing Second Major in Mathematics can count ST2132 towards Science Module requirements. Students cannot use ST2132 to meet the requirements of Second Major in Mathematics and have to choose another elective from List II of the Mathematics major. If a student has already taken ST2131 and later quits from the Second Major in Statistics programme, he/she will have to take ST2132 to fulfil the BComp (CS) degree requirements. For all other students: a student who have not taken 'O'-level Physics, may take a Life-Science module to meet this requirement; A student who have 'O'-level Physics but have not taken 'A'-level / H2 Physics must take either PC1221/X or PC1222/X to meet the Science module requirement; A student who have taken 'A'-level / H2 Physics may take either a Physics, Chemistry, Life-Science, Statistics, or Mathematics module as a Science module. The Science module must be a module from List S1 (recommended) or List S2. Please refer to: http://www.comp.nus.edu.sg/undergraduates/documents/Sciencemodules_S1_S2.pdf for details. 3.2.9 Bachelor of Computing in Information Security

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-security-2/ Update 1: Footnote 5 is amended From: 5 Students who are pursuing either a Double Degree with Mathematics/Applied Mathematics, Second Major in Mathematics or Second Major in Statistics, can replace ST2334 with ST2131 and ST2132. The additional 4 MCs will be taken from the Unrestricted Electives space. to: 5 Students pursuing a Second Major in Mathematics or Statistics will take ST2131 Probability in place of ST2334 Probability and Statistics. The students will take ST2132 as a core module in the second major in Statistics programme and are highly encouraged to take ST2132 as an elective module in the second major in Mathematics programme. If a student who has already taken ST2131 quits the Second major in Mathematics or Statistics, he/she will have to take ST2132 to fulfil the BComp (Information Security) degree requirements. 3.2.10 Bachelor of Computing in Information Security – Co-operative Education Programme http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-security-coop/ Update 1: Footnote 5 is amended: From: 5 Students who are pursuing either a Double Degree with Mathematics/Applied Mathematics, Second Major in Mathematics or Second Major in Statistics, can replace ST2334 with ST2131 and ST2132. The additional 4 MCs will be taken from the Unrestricted Electives space. to: 5 Students pursuing a Second Major in Mathematics or Statistics will take ST2131 Probability in place of ST2334 Probability and Statistics. The students will take ST2132 as a core module in the second major in

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Statistics programme and are highly encouraged to take ST2132 as an elective module in the second major in Mathematics programme. If a student who has already taken ST2131 quits the Second major in Mathematics or Statistics, he/she will have to take ST2132 to fulfil the BComp (Information Security) degree requirements. 3.2.11 Bachelor of Computing in Information Systems http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-systems/ Update 1: Footnote 3 for Table 6 is amended as follows: From: 3 Students who are pursuing either Second Major in Mathematics or Second Major in Statistics can replace ST2334 with ST2131 and ST2132. The additional 4 MCs will be taken from the Unrestricted Elective space. to: 3 For students taking Second Major in Statistics, they can replace ST2334 with ST2131 to meet first major requirement. For students taking the Second Major in Mathematics, they can replace ST2334 with both ST2131 and ST2132 to meet first major requirement. The MCs for ST2132 come from UE. For students taking the minor in Mathematics, they can replace ST2334 with ST2131 and take ST2132 as an unrestrictive elective to meet first major requirement. 3.2.12 Bachelor of Science in Business Analytics http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-science-in-business-analytics-2/ Update 1: Table 7 and footnotes are amended as highlighted below: Table 7: Summary of degree requirements for Bachelor of Science (Business Analytics)

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

MODULES	MCS	SUB TOTALS
UNIVERSITY LEVEL REQUIREMENTS Please refer to Section 3.2.1.		**20**
PROGRAMME REQUIREMENTS		**108**
Core Modules	**72**	
BT1101 Introduction to Business Analytics	4	
CS1010S Programming Methodology	4	
CS1020 Data Structures and Algorithms I	4	
EC1301 Principles of Economics[1]	4	
IS1103/X IS Innovations in Organisations and Society	4	
MA1311 Matrix Algebra and Applications, or MA1101R Linear Algebra I[2]	4	
MA1521 Calculus for Computing, or MA1102R Calculus[2]	4	
MKT1705X Principles of Marketing	4	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			BT2101 Decision Making Methods and Tools	4	
			BT2102 Data Management and Visualisation	4	
			CS2010 Data Structures and Algorithms II	4	
			IS2101 Business and Technical Communication	4	
			ST2334 Probability and Statistics [3]	4	
			BT3101 Business Analytics Capstone Project	4	
			BT3102 Computational Methods for Business Analytics	4	
			BT3103 Application Systems Development for Business Analytics	4	
			IS3103 Information Systems Leadership and Communication	4	
			~~ST3131 Regression Analysis~~ BT4240 Machine Learning for Predictive Data Analytics	4	
			Programme Electives (PE)	**24**	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			Option 1: Choose 6 modules to make up 24 MCs from Lists A, B and C, with at least 2 modules each from Lists A and B. 5 of 6 modules must be at level-4000. **Option 2**: Choose BT4101 and 3 modules to make up 24 MCs from Lists A, B and C, with at least 1 module each from Lists A and B. 2 of 3 modules must be at level-4000.BT4101 B.Sc. Dissertation List A (Functional): ~~DSN~~DBA3712 Dynamic Pricing and Revenue Management IE3120 Manufacturing Logistics IS3240 Economics of E-Business BT4211 Data-Driven Marketing BT4212 Search Engine Optimization and Analytics DSC4213 Analytical Tools for Consulting IS4250 Healthcare Analytics MKT4812 Marketing Analytics List B (Analytics Methods): IE2110 Operations Research I [4] , or ~~DSN~~DBA3701 Introduction To Optimisation CS3244 Machine Learning ~~DSN~~DBA3803 Predictive Analytics in Business BSE4711 Econometrics for Business II BT4221 Big Data Techniques and Technologies BT4222 Mining Web Data for Business Insights IS4241 Social Media Network Analysis IE4210 Operations Research II ST3131 Regression Analysis [4a] ~~ST4240 Data Mining~~ ST4245 Statistical Methods for Finance List C (Technology Implementation) IS3221 Enterprise Resource Planning Systems IS3261 Mobile Solutions Design and Development	All modules are 4 MCs modules, except BT4101 (12 MCs)	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

IS4228 Information Technologies in Financial Services IS4302 Blockchain and Distributed Ledger Technologies		
IS4010 Industry Internship Programme [5]	**12**	
UNRESTRICTED ELECTIVES		**32**
Grand Total		**160**

[1] Students have done EC1101E Introduction to Economic Analysis can use it to replace EC1301.

[2] Students are encouraged to take these MA module options should they wish to pursue a more rigorous treatment of the subject topics covered.

[3] Students who are pursuing a Second Major in Mathematics or Second Major in Statistics can replace ST2334 with ST2131 and ST2132. The additional 4 MCs will be taken from the UE space. For students taking Second Major in Statistics, they can replace ST2334 with ST2131 to meet first major requirement. For students taking the Second Major in Mathematics, they can replace ST2334 with both ST2131 and ST2132 to meet first major requirement. The MCs for ST2132 come from Unrestricted Electives. For students taking the minor in Mathematics, they can replace ST2334 with ST2131 and take ST2132 as an unrestricted elective to meet first major requirement.

[4] Students are encouraged to take IE2110 should they wish to choose IE4210 as an elective module.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
4a Students who are doing or contemplating to do minor/second major requiring ST3131 such as Statistics which has more than allowed overlap cannot double count ST3131 towards fulfilling the BSc (BA) programme elective requirement.
[5] 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.

3.2.13 Bachelor of Science in Business Analytics – Co-operative Education Programme
http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-science-in-business-analytics-coop/
Update 1: Table 8 ia amended as highlighted in red texts with insertion of footnotes 2a and 3a
Table 8: Summary of degree requirements for Bachelor of Science (Business Analytics) – Co-operative Education Programme

<table>
<tr><th>MODULES</th><th>MCS</th><th>SUB TOTALS</th></tr>
<tr><td>UNIVERSITY LEVEL REQUIREMENTS
Please refer to Section 3.2.1.</td><td></td><td>20</td></tr>
<tr><td>PROGRAMME REQUIREMENTS</td><td></td><td>124</td></tr>
<tr><td>Core Modules</td><td>84</td><td></td></tr>
<tr><td>BT1101 Introduction to Business Analytics</td><td>4</td><td></td></tr>
<tr><td>CS1010S Programming Methodology</td><td>4</td><td></td></tr>
<tr><td>CS1020 Data Structures and Algorithms I</td><td>4</td><td></td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			EC1301 Principles of Economics[1]	4	
			IS1103/X IS Innovations in Organisations and Society	4	
			MA1311 Matrix Algebra and Applications, or MA1101R Linear Algebra I[2]	4	
			MA1521 Calculus for Computing, or MA1102R Calculus[2]	4	
			MKT1705X Principles of Marketing	4	
			BT2101 Decision Making Methods and Tools	4	
			BT2102 Data Management and Visualisation	4	
			CS2010 Data Structures and Algorithms II	4	
			IS2101 Business and Technical Communication	4	
			ST2334 Probability and Statistics [2a]	4	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			BT3102 Computational Methods for Business Analytics	4	
			BT3103 Application Systems Development for Business Analytics	4	
			IS3103 Information Systems Leadership and Communication	4	
			~~ST3131 Regression Analysis~~BT4240 Machine Learning for Predictive Data Analytics [3a]	4	
			Programme Electives (PE)	**24**	
			Option 1: Choose 6 modules to make up 24 MCs from both List A and List B, with at least 2 modules from each list. 5 of 6 modules must be at 4000 level. **Option 2:** Choose BT4101 and 3 modules to make up 24 MCs from both List A and List B, with at least 1 module from each list. 2 of 3 modules must be at 4000 level. BT4101 B.Sc. Dissertation List A (Business Applications): ~~DSN~~DBA3712 Dynamic Pricing and Revenue Management IE3120 Manufacturing Logistics IS3240 Economics of E-Business BT4211 Data-Driven Marketing BT4212 Search Engine Optimization and Analytics ~~DSN~~DBA4811 Analytical Tools for Consulting	All modules are 4 MCs modules, except BT4101 (12 MCs)	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			IS4250 Healthcare Analytics MKT4812 Marketing Analytics List B (Analytical Methods): IE2110 Operations Research I[3], or ~~DSN~~DBA3701 Introduction To Optimisation CS3244 Machine Learning ~~DSN~~DBA3803 Predictive Analytics in Business BSE4711 Econometrics for Business II BT4221 Big Data Techniques and Technologies BT4222 Mining Web Data for Business Insights IS4241 Social Media Network Analysis IE4210 Operations Research II ~~ST4240 Data Mining~~ ST3131 Regression Analysis [3a] ST4245 Statistical Methods for Finance List C (Technology Implementation): IS3221 Enterprise Resource Planning Systems IS3261 Mobile Solutions Design and Development IS4228 Information Technologies in Financial Services IS4302 Blockchain and Distributed Ledger Technologies		
			Co-op Internship Scheme	**32**	
			BT2010 Business Analytics Immersion Programme	**6**	
			BT4010 Business Analytics Internship Programme [4]	**12**	
			BT4011 Business Analytics Capstone Industry Project	**14**	
			UNRESTRICTED ELECTIVES		16

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			<table><tr><td>Grand Total</td><td></td><td>160</td></tr></table> 1: Students who have done EC1101E Introduction to Economic Analysis can use it to replace EC1301. 2: Students are encouraged to take these MA module options should they wish to pursue a more rigorous treatment of the subject topics covered. 2a: For students taking Second Major in Statistics, they can replace ST2334 with ST2131 to meet first major requirement. For students taking the Second Major in Mathematics, they can replace ST2334 with both ST2131 and ST2132 to meet first major requirement. The MCs for ST2132 come from UE. For students taking the minor in Mathematics, they can replace ST2334 with ST2131 and take ST2132 as an unrestrictive elective to meet first major requirement. 3: Students are encouraged to take IE2110 should they wish to choose IE4210 as an elective module. 3a: Students who are doing or contemplating to do minor/second major requiring ST3131 such as Statistics which has more than allowed overlap cannot double count ST3131 towards fulfilling the BSc (BA) programme elective requirement. 4: 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.
17.	10 Jul 2017	SCALE	Texts to be updated at: http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/financial-assistance/ highlighted in yellow with red texts as follows: 3.5 Financial Assistance The Ministry of Education (MOE) provides tuition fee subsidy of 55% and 20% for eligible Singapore Citizens and Permanent Residents, respectively, taking part-time undergraduate programmes in local universities. eligible Singaporeans and Singapore Permanent Residents (SPR) taking part-time undergraduate course in the local universities with a substantial tuition fee subsidy. * To be eligible for MOE's tuition fee subsidy, in addition to fulfilling the nationality criteria, students must also satisfy the following: • Must not have previously received government subsidy/sponsorship for a completed first degree from a local university, including NUS/NTU/SMU/SUTD/SIT/SUSS, or from an overseas university funded by government scholarship/bursary;

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

			• Be at least 21 years old; and
			• Meet one of the work experience requirements below:
			
			  • Possess 2 years of full-time work experience; or
			  • Have fully discharged their National Service liability; or
			  • Are currently employed on a full-time basis.
			
			• At least 21 years old;
			• Must not have previously received a government subsidy/sponsorship for a completed first degree; these include first degrees from NUS/NTU/SMU/SUTD/SUSS, or from an overseas university funded by government scholarship/bursary; and
			• Must fulfill one of the following:
			  • 2 years of full-time work experience; OR
			  • fully discharged the NS liability; OR
			  • currently employed on a full-time basis.
			
			It should be noted that part-time employment will not be considered as "full-time work experience". A part-time employee is one who works for less than 35 hours a week under a contract of service with an employer.
			
			Finally, as part of Singapore's national initiative of encouraging continuing education and lifelong learning, MOE provides additional subsidy such that Singaporeans aged 40 and above will pay tuition fees that are 60% lower than the standard subsidised fees payable by other Singaporeans who are below 40 years old. This amounts to a total tuition fee subsidy of at least a little over 80%.
			* Subsidy funding for BTech Computing has been requested and is currently being reviewed by MOE.

18.	1 Aug 2017	SCALE	**NUS Bulletin 2017-18 – Updates from SCALE – Alignment issues** (1 Aug 2017) *(To shift the word/module code in each red box to the next line, e.g., the word in the first red box should be shifted to the next line such that the next line will be reflected as 'Elective Module 2 (4)' instead of 'Module 2 (4)')*

http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-computing/bachelor-of-technology-business-analytics/

In Internet Explorer

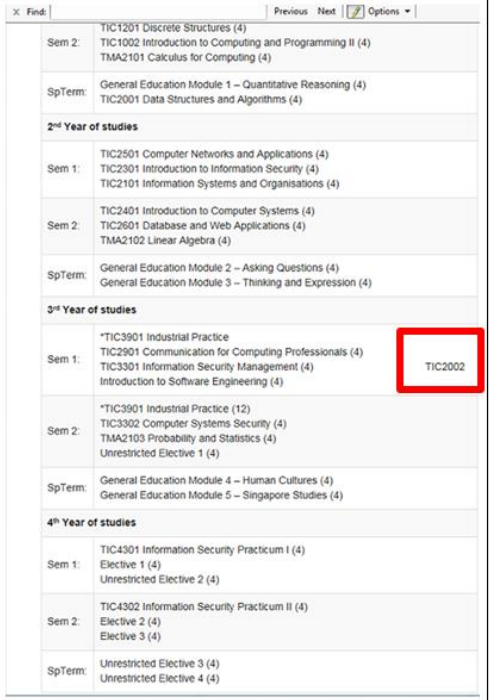
Sem 2:	TMA2101 Calculus for Computing (4) TBA2101 Building an Analytics Organisation (4)
SpTerm:	General Education Module 1 – Quantitative Reasoning (4) TIC2001 Data Structures and Algorithms (4)
2nd Year of studies	
Sem 1:	TMA2103 Probability and Statistics (4) TIC1101 Professional, Ethical and Social Issues in Computing (4) TIC2601 Database and Web Applications (4)
Sem 2:	TBA2103 Data Visualisation (4) TBA3204 Web Analytics (4) TBA2104 Predictive Analytics (4)
SpTerm:	General Education Module 2 – Asking Questions (4) General Education Module 3 – Thinking and Expression (4)
3rd Year of studies	
Sem 1:	*TIC3901 Industrial Practice TBA4212 Search Engine Optimisation and Analytics (4) TBA2105 Web Mining (4) TIC2901 Communications for Computing Professionals (4)
Sem 2:	*TIC3901 Industrial Practice (12) TBA3102 Text Analytics (4) Elective Module 1 (4) Elective Module 2 (4)
SpTerm:	General Education Module 4 – Human Cultures (4) General Education Module 5 – Singapore Studies (4)
4th Year of studies	
Sem 1:	TBA3103 Application Systems Development for Business Analytics Elective Module 3 Unrestricted Elective Module 1
Sem 2:	Elective Module 4 Elective Module 5 Unrestricted Elective Module 2
SpTerm:	Unrestricted Elective Module 3 Unrestricted Elective Module 4

In Chrome

SpTerm:	General Education Module 1 – Quantitative Reasoning (4) TIC2001 Data Structures and Algorithms (4)
2nd Year of studies	
Sem 1:	TMA2103 Probability and Statistics (4) TIC1101 Professional, Ethical and Social Issues in Computing (4) TIC2601 Database and Web Applications (4)
Sem 2:	TBA2103 Data Visualisation (4) TBA3204 Web Analytics (4) TBA2104 Predictive Analytics (4)
SpTerm:	General Education Module 2 – Asking Questions (4) General Education Module 3 – Thinking and Expression (4)
3rd Year of studies	
Sem 1:	*TIC3901 Industrial Practice TBA4212 Search Engine Optimisation and Analytics (4) TBA2105 Web Mining (4) TIC2901 Communications for Computing Professionals (4)
Sem 2:	*TIC3901 Industrial Practice (12) TBA3102 Text Analytics (4) Elective Module 1 (4) Module 2 (4) Elective
SpTerm:	General Education Module 4 – Human Cultures (4) General Education Module 5 – Singapore Studies (4)
4th Year of studies	
Sem 1:	TBA3103 Application Systems Development for Business Analytics Elective Module 3 Unrestricted Elective Module 1
Sem 2:	Elective Module 4 Elective Module 5 Unrestricted Elective Module 2
SpTerm:	Unrestricted Elective Module 3 Unrestricted Elective Module 4

http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-computing/bachelor-of-technology-cybersecurity/

In Internet Explorer



Find: Previous Next Options

Sem 2:	TIC1201 Discrete Structures (4) TIC1002 Introduction to Computing and Programming II (4) TMA2101 Calculus for Computing (4)
SpTerm:	General Education Module 1 – Quantitative Reasoning (4) TIC2001 Data Structures and Algorithms (4)
2nd Year of studies	
Sem 1:	TIC2501 Computer Networks and Applications (4) TIC2301 Introduction to Information Security (4) TIC2101 Information Systems and Organisations (4)
Sem 2:	TIC2401 Introduction to Computer Systems (4) TIC2601 Database and Web Applications (4) TMA2102 Linear Algebra (4)
SpTerm:	General Education Module 2 – Asking Questions (4) General Education Module 3 – Thinking and Expression (4)
3rd Year of studies	
Sem 1:	*TIC3901 Industrial Practice TIC2901 Communication for Computing Professionals (4) TIC3301 Information Security Management (4) Introduction to Software Engineering (4)
Sem 2:	*TIC3901 Industrial Practice (12) TIC3302 Computer Systems Security (4) TMA2103 Probability and Statistics (4) Unrestricted Elective 1 (4)
SpTerm:	General Education Module 4 – Human Cultures (4) General Education Module 5 – Singapore Studies (4)
4th Year of studies	
Sem 1:	TIC4301 Information Security Practicum I (4) Elective 1 (4) Unrestricted Elective 2 (4)
Sem 2:	TIC4302 Information Security Practicum II (4) Elective 2 (4) Elective 3 (4)
SpTerm:	Unrestricted Elective 3 (4) Unrestricted Elective 4 (4)

TIC2002

In Chrome

SpTerm:	General Education Module 1 – Quantitative Reasoning (4) TIC2001 Data Structures and Algorithms (4)
2nd Year of studies	
Sem 1:	TIC2501 Computer Networks and Applications (4) TIC2301 Introduction to Information Security (4) TIC2101 Information Systems and Organisations (4)
Sem 2:	TIC2401 Introduction to Computer Systems (4) TIC2601 Database and Web Applications (4) TMA2102 Linear Algebra (4)
SpTerm:	General Education Module 2 – Asking Questions (4) General Education Module 3 – Thinking and Expression (4)
3rd Year of studies	
Sem 1:	*TIC3901 Industrial Practice TIC2901 Communication for Computing Professionals (4) TIC3301 Information Security Management (4) Introduction to Software Engineering (4)
Sem 2:	*TIC3901 Industrial Practice (12) TIC3302 Computer Systems Security (4) TMA2103 Probability and Statistics (4) Unrestricted Elective 1 (4)
SpTerm:	General Education Module 4 – Human Cultures (4) General Education Module 5 – Singapore Studies (4)
4th Year of studies	
Sem 1:	TIC4301 Information Security Practicum I (4) Elective 1 (4) Unrestricted Elective 2 (4)
Sem 2:	TIC4302 Information Security Practicum II (4) Elective 2 (4) Elective 3 (4)
SpTerm:	Unrestricted Elective 3 (4) Unrestricted Elective 4 (4)

TIC2002

http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-computing/bachelor-of-technology-software-engineering/

In Internet Explorer

2nd Year of studies	
Sem 1:	TIC2501 Computer Networks and Applications (4) TIC2301 Introduction to Information Security (4) TIC2002 Introduction to Software Engineering (4)
Sem 2:	TIC2401 Introduction to Computer Systems (4) TIC2601 Database and Web Applications (4) TMA2102 Linear Algebra (4)
SpTerm:	General Education Module 2 – Asking Questions (4) General Education Module 3 – Thinking and Expression (4)
3rd Year of studies	
Sem 1:	*TIC3901 Industrial Practice TIC3002 User Interface Design and Implementation (4) TIC2701 Principles of Programming Languages (4) Communication for Computing Professionals (4)
Sem 2:	*TIC3901 Industrial Practice (12) TIC3001 Software Requirements Analysis and Design (4) TMA2103 Probability and Statistics (4) Unrestricted Elective 1 (4)
SpTerm:	General Education Module 4 – Human Cultures (4) General Education Module 5 – Singapore Studies (4)
4th Year of studies	
Sem 1:	TIC4301 Information Security Practicum I (4) Elective 1 (4) Unrestricted Elective 2 (4)
Sem 2:	TIC4302 Information Security Practicum II (4) Elective 2 (4) Elective 3 (4)
SpTerm:	Unrestricted Elective 3 (4) Unrestricted Elective 4 (4)

TIC2901

In Chrome

2nd Year of studies	
Sem 1:	TIC2501 Computer Networks and Applications (4) TIC2301 Introduction to Information Security (4) TIC2002 Introduction to Software Engineering (4)
Sem 2:	TIC2401 Introduction to Computer Systems (4) TIC2601 Database and Web Applications (4) TMA2102 Linear Algebra (4)
SpTerm:	General Education Module 2 – Asking Questions (4) General Education Module 3 – Thinking and Expression (4)
3rd Year of studies	
Sem 1:	*TIC3901 Industrial Practice TIC3002 User Interface Design and Implementation (4) TIC2701 Principles of Programming Languages (4) Communication for Computing Professionals (4)
Sem 2:	*TIC3901 Industrial Practice (12) TIC3001 Software Requirements Analysis and Design (4) TMA2103 Probability and Statistics (4) Unrestricted Elective 1 (4)
SpTerm:	General Education Module 4 – Human Cultures (4) General Education Module 5 – Singapore Studies (4)
4th Year of studies	
Sem 1:	TIC4301 Information Security Practicum I (4) Elective 1 (4) Unrestricted Elective 2 (4)
Sem 2:	TIC4302 Information Security Practicum II (4) Elective 2 (4) Elective 3 (4)
SpTerm:	Unrestricted Elective 3 (4) Unrestricted Elective 4 (4)

TIC2901

19.	12 Sep 2017	SCALE	Texts updated at: http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/ are highlighted in yellow with red texts as follows: Table: 120-MC BTech Engineering curriculum structure

	Minimum MCs required
University Level Requirements	
General Education (GE) Modules [1]	20
Sub-total	**20**
Programme Requirements [2]	
Ethics in Engineering	4
Foundation & Major Requirements	85 – ~~89~~ 96
Sub-total	**89 – ~~93~~ 100**
Unrestricted Elective Modules [3]	**~~8~~ 0 – 12**
Grand-total	**120 – 121**

Notes:

1. A limited selection of GE modules (from the wide range available in the University) which can best meet the interests and professional needs of BTech students, will be offered specially in the evenings. The list of modules will be available in the SCALE website in due course.
2. These are specific to the individual BTech programme and reference should be made to the relevant sections.
3. UEMs enable students to pursue their interests without any restrictions. Students may select any module at any level from among Technical or GE modules to meet this requirement.

<table>
<tr>
<td>20.</td>
<td>22 Sep 2017</td>
<td>SCALE</td>
<td>
1. Texts to be updated at http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-chemical-engineering/ with changes highlighted in yellow as shown below.
3.4.1 Bachelor of Technology (Chemical Engineering)
Study Schedule
There is only one intake per academic year in Semester 2 (i.e. January). One sample study schedule for a four-year candidature is shown below. This assumes the students' work and other commitments allow them sufficient time to properly cope with their studies. Students are strongly advised to slow down if necessary so that they progress at their own comfortable pace.
Sample Study Schedule (4-year candidature beginning in Semester 2 of an AY):
1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.
<table>
<tr><td colspan="2">1st Year of studies</td></tr>
<tr><td>Sem 2:</td><td>TCN1411 Mathematics for Chemical Engineers 1 (4)
TCN1422 Materials for Chemical Engineers (4)
TCN1111 Chemical Engineering Principles (4)</td></tr>
<tr><td>SpTerm:</td><td>TCN2411 Mathematics for Chemical Engineers 2 (4)
General Education Module 1 – Quantitative Reasoning (4)</td></tr>
<tr><td>Sem 1:</td><td>TCN1005 MatLab Programming for Chemical Engineers (4)
TCN2121 Chemical Engineering Thermodynamics (4)
TCN2122 Fluid Mechanics (4)</td></tr>
<tr><td colspan="2">2nd Year of studies</td></tr>
<tr><td>Sem 2:</td><td>TCN2116 Chemical Kinetics & Reactor Design (4)
TCN2125 Heat and Mass Transfer (4)
TCN3124 Particle Technology (4)</td></tr>
<tr><td>SpTerm:</td><td>TCN3135 Process Safety, Health and Environment (3)
General Education Module 2 – Asking Questions (4)</td></tr>
</table>
</td>
</tr>
</table>

Sem 1:	TCN3121 Process Dynamics & Control (4) TCN3132 Separation Processes (5) TCN3421 Process Modelling & Numerical Simulation (4)
3rd Year of studies	
Sem 2:	TCN4119* BTech Dissertation / Technical Elective Module (4) Technical Elective Module 1 (4) General Education Module 3 ~~– Thinking & Expression~~ (4)
SpTerm:	TTG2415 Ethics in Engineering (4) TCN4119* BTech Dissertation General Education Module 4 ~~– Human Cultures~~ (4)
Sem 1:	TCN4119* BTech Dissertation (8) / Technical Elective Module (4) TCN4122 Process Synthesis and Simulation (3) TTG3001* Industrial Practice / Unrestricted Elective Module (4)
4th Year of studies	
Sem 2:	TCN4124* Final Year Design Project TTG3001* Industrial Practice (12) / Unrestricted Elective Module (4) ~~General Education Module 4 – Human Cultures (4)~~ General Education Module 5 ~~– Singapore Studies~~ (4)
SpTerm:	TCN4124* Final Year Design Project (6) ~~TTG3001* Industrial Practice (12) /~~ Unrestricted Elective Module (4)
Sem 1:	Technical Elective Module 2 (4) Technical Elective Module 3 (4) ~~General Education Module 5 – Singapore Studies (4)~~

2. Texts to be updated at http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-electronics-engineering/ with changes highlighted in yellow as shown below.

3.4.3 Bachelor of Technology (Electronics Engineering)

Study Schedules

There are two intakes per academic year, in Semester 1 (i.e. August) and in Semester 2 (i.e. January). The respective sample study schedules for a four-year candidature are presented below. These assume the students' work and other commitments allow them sufficient time to properly cope with their studies. Students are strongly advised to slow down if necessary so that they progress at their own comfortable pace.

A. Sample Study Schedule (4-year candidature beginning in Semester 1 of an AY):

1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

1st Year of studies	
Sem 1:	General Education Module 1 ~~– Quantitative Reasoning~~ (4) TTG1401 Engineering Mathematics I (4) TEE1001 Emerging Technologies in EE (4)
Sem 2:	TEE2002 Engineering Mathematics II (4) TEE2020 Digital Fundamentals (5) TEE2101 Programming Methodology (4)
SpTerm:	General Education Module 2 ~~– Asking Questions~~ (4) General Education Module 3 (4)
2nd Year of studies	

Sem 1:	TEE2003 Advanced Mathematics for Engineers (4) TEE2024 Programming for Computer Interfaces (5) TEE2021 Devices & Circuits (4)
Sem 2:	TEE2011 Engineering Electromagnetics (4) TEE2031 Circuits and Systems Design Lab (3) TEE2023 Signals & Systems (4)
SpTerm:	~~TTG2415 Ethics in Engineering (4) /~~ General Education Module 4 (4)
3rd Year of studies	
Sem 1:	Elective 1 (4) ~~Elective 2 (4) /~~ General Education Module ~~4/~~5 (4) TTG3002* Industrial Practice TEE2032 Signals and Communications Design Lab (3)
Sem 2:	TEE3031 Innovation & Enterprise I (4) Elective 2 (4) ~~/ General Education Module 4/5 (4)~~ Elective 3 (4) TTG3002* Industrial Practice (8)
SpTerm:	TTG2415 Ethics in Engineering (4)/ General Education Module 5 (4) ~~TTG3002* Industrial Practice (8)~~

4th Year of studies		
Sem 1:	Elective 4 (4) Elective 5 (4) TEE4001* BTech Dissertation	
Sem 2:	Elective 6 (4) TEE4001* BTech Dissertation (12)	

B. Sample Study Schedule (4-year candidature beginning in Semester 2 of an AY):
1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

1st Year of studies		
Sem 2:	TTG1401 Engineering Mathematics I (4) TEE2020 Digital Fundamentals (5) TEE2101 Programming Methodology (4)	
SpTerm:	General Education Module 1 ~~– Asking Questions~~ (4) General Education Module 2 (4)	
Sem 1:	TEE2002 Engineering Mathematics II (4) General Education Module 3 ~~– Quantitative Reasoning~~ (4) TEE1001 Emerging Technologies in EE (4)	
2nd Year of studies		
Sem 2:	TEE2003 Advanced Mathematics for Engineers (4) TEE2011 Engineering Electromagnetics (4) TEE2023 Signals and Systems (4)	

SpTerm:	General Education Module 4 (4)
Sem 1:	TEE2021 Devices & Circuits (4) TEE2032 Signals and Communications Design Lab (3) TEE2024 Programming for Computer Interfaces (5) TTG3002* Industrial Practice
3rd Year of studies	
Sem 2:	TEE3031 Innovation & Enterprise I (4) TEE2031 Circuits and Systems Design Lab (3) Elective 1 (4) TTG3002* Industrial Practice (8)
SpTerm:	TTG2415 Ethics in Engineering (4) ~~/ General Education Module 5 (4)~~ ~~TTG3002* Industrial Practice~~
Sem 1:	Elective 2 (4) Elective 3 (4) General Education Module 5 (4) ~~TTG3002* Industrial Practice (8)~~
4th Year of studies	
Sem 2:	Elective 4 (4) Elective 5 (4) TEE4001* BTech Dissertation
SpTerm:	TTG2415 Ethics in Engineering (4) TEE4001* BTech Dissertation
Sem 1:	TEE4001* BTech Dissertation (12) Elective 6 (4)

3. Texts to be updated at http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-industrial-management-engineering/ with changes highlighted in yellow as shown below.

3.4.4 Bachelor of Technology (Industrial & Management Engineering)

Study Schedules

There are two intakes per academic year, in Semester 1 (i.e. August) and in Semester 2 (i.e. January). The respective sample study schedules for a four-year candidature are presented below. These assume the students' work and other commitments allow them sufficient time to properly cope with their studies. Students are strongly advised to slow down if necessary so that they progress at their own comfortable pace.

A. Sample Study Schedule (4-year candidature beginning in Semester 1 of an AY):

1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

1st Year of studies	
Sem 1:	TTG1401 Engineering Mathematics I (4) TEE2101 Programming Methodology (4) TIE2010 Introduction to Industrial System (4)
Sem 2:	TIE2150 Human Factors Engineering (4) TIE2140 Engineering Economy (4) TIE2130 Quality Engineering I (4)
SpTerm:	General Education Module 1 ~~– Quantitative Reasoning~~ (4) General Education Module 2 ~~– Asking Questions~~ (4)
2nd Year of studies	
Sem 1:	TIE2120 Probability and Statistics (4) TIE2110 Operations Research I (4) TIE3110 Simulation (5)

Sem 2:	TIE2100 Probability Models with Applications (4) TIE3010 Systems Thinking and Design (4) ~~TTG2415 Ethnics in Engineering (4)~~ General Education Module 3 (4)
SpTerm:	~~General Education Module 3 (4)~~ TTG2415 Ethnics in Engineering (4) General Education Module 4 (4)
3rd Year of studies	
Sem 1:	TIE3101 Statistics for Engineering Applications (4) TIE3100* Systems Design Project TTG3001* Industrial Practice
Sem 2:	Elective 1 (4) TIE3100* Systems Design Project (8) TTG3001* Industrial Practice (12)
SpTerm:	General Education Module 5 (4) Elective 2 (4) ~~TTG3001* Industrial Practice (12)~~
4th Year of studies	
Sem 1:	TIE4240 Project Management (4) Elective 3 (4) TIE4101* BTech Dissertation
Sem 2:	Elective 4 (4) TIE4101* BTech Dissertation (8)

B. Sample Study Schedule (4-year candidature beginning in Semester 2 of an AY):
1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

			1st Year of studies
			Sem 2: — TTG1401 Engineering Mathematics I (4) TIE2140 Engineering Economy (4) TIE2130 Quality Engineering I (4)
			SpTerm: — General Education Module 1 ~~– Quantitative Reasoning~~ (4) General Education Module 2 ~~– Asking Questions~~ (4)
			Sem 1: — TEE2101 Programming Methodology (4) TIE2010 Introduction to Industrial System (4) TIE2120 Probability and Statistics (4)
			2nd Year of studies
			Sem 2: — TIE2100 Probability Models with Applications (4) TIE2150 Human Factors Engineering (4) TIE3010 Systems Thinking and Design (4)
			SpTerm: — General Education Module 3 (4) General Education Module 4 (4)
			Sem 1: — TIE2110 Operations Research 1 (4) TIE3110 Simulation (5) TIE3101 Statistics for Engineering Applications (4) TTG3001* Industrial Practice
			3rd Year of studies
			Sem 2: — TIE3100* Systems Design Project Elective 1 (4) ~~TTG2415 Ethics in Engineering (4)~~ General Education Module 5 (4) TTG3001* Industrial Practice (12)

SpTerm:	TIE3100* Systems Design Project ~~General Education Module 5 (4)~~ TTG2415 Ethics in Engineering (4) ~~TTG3001* Industrial Practice~~
Sem 1:	TIE4240 Project Management (4) ~~TTG3001* Industrial Practice (12)~~ TIE3100* Systems Design Project (8)
4th Year of studies	
Sem 2:	TIE4101* BTech Dissertation Elective 2 (4)
SpTerm:	TIE4101* BTech Dissertation Elective 3 (4)
Sem 1:	TIE4101* BTech Dissertation (8) Elective 4 (4)

4. Texts to be updated at http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-mechanical-engineering/with changes highlighted in yellow as shown below.

3.4.5 Bachelor of Technology (Mechanical Engineering)

Study Schedules

There are two intakes per academic year, in Semester 1 (i.e. August) and in Semester 2 (i.e. January). The respective sample study schedules for a four-year candidature are presented below. These assume the students' work and other commitments allow them sufficient time to properly cope with their studies. Students are strongly advised to slow down if necessary so that they progress at their own comfortable pace.

A. Sample Study Schedule (4-year candidature beginning in Semester 1 of an AY):
1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.

2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

1st Year of studies	
Sem 1:	TTG1401 Engineering Mathematics I (4) TME2121 Engineering Thermodynamics (4) TME2151 Principles of Mechanical Engineering Materials (4)
Sem 2:	TME2401 Engineering Mathematics II (4) TME2114 Mechanics of Materials II (3) TME2101 Fundamentals of Mechanical Design (4)
SpTerm:	General Education Module 1 ~~– Quantitative Reasoning~~ (4) General Education Module 2 ~~– Asking Questions~~ (4)
2nd Year of studies	
Sem 1:	TME2134 Fluid Mechanics I (4) TME3112 Mechanics of Machines (4) TME3162 Manufacturing Processes (4)
Sem 2:	TME2143 Sensors and Actuators (4) TME2135 Fluid Mechanics II (4) General Education Module 3 (4) ~~TTG2415 Ethics in Engineering (4)~~ ~~TTG3002* Industrial Practice~~
SpTerm:	~~General Education Module 3 (4)~~ TTG2415 Ethics in Engineering (4) ~~TTG3002* Industrial Practice~~
3rd Year of studies	

Sem 1:	TME2142 Feedback Control Systems (4) Elective 1 (4) Elective 2 (4) TTG3002* Industrial Practice ~~(8)~~
Sem 2:	TME3101 Mechanical Systems Design (6) TME3122 Heat Transfer (4) Elective 3 (4) TTG3002* Industrial Practice (8)
SpTerm:	General Education Module 4 (4) General Education Module 5 (4)
4th Year of studies	
Sem 1:	Elective 4 (4) Elective 5 (4) TME4102* BTech Dissertation
Sem 2:	Elective 6 (4) TME4102* BTech Dissertation (8)

B. Sample Study Schedule (4-year candidature beginning in Semester 2 of an AY):
1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

1st Year of studies	
Sem 2:	TTG1401 Engineering Mathematics I (4) TME2114 Mechanics of Materials II (3) TME2101 Fundamentals of Mechanical Design (4)
SpTerm:	General Education Module 1 ~~– Quantitative Reasoning~~ (4) General Education Module 2 ~~– Asking Questions~~ (4)

Sem 1:	TME2401 Engineering Mathematics II (4) TME2121 Engineering Thermodynamics (4) TME2134 Fluid Mechanics I (4)
2nd Year of studies	
Sem 2:	TME2143 Sensors and Actuators (4) TME2135 Fluid Mechanics II (4) TME3101 Mechanical Systems Design (6)
SpTerm:	General Education Module 3 (4)
Sem 1:	TME2151 Principles of Mechanical Engineering Materials (4) TME3112 Mechanics of Machines (4) TME3162 Manufacturing Processes (4) TTG3002* Industrial Practice
3rd Year of studies	
Sem 2:	Elective 1 (4) TME3122 Heat Transfer (4) General Education Module 4 (4) ~~TTG2415 Ethics in Engineering (4)~~ TTG3002* Industrial Practice (8)
SpTerm:	General Education Module 4 ~~-~~5 (4) ~~TTG3002* Industrial Practice (8)~~
Sem 1:	TME2142 Feedback Control Systems (4) Elective 2 (4) Elective 3 (4)
4th Year of studies	

Sem 2:	TME4102* BTech Dissertation Elective 4 (4) Elective 5 (4)
SpTerm:	TME4102* BTech Dissertation TTG2415 Ethics in Engineering (4) ~~General Education Module 5 (4)~~
Sem 1:	TME4102* BTech Dissertation (8) Elective 6 (4)

21.	18 Dec 2017	SCALE	NUS Bulletin 2017/18 – Updates submitted by SCALE (18 Dec 2017) Texts updated at http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-industrial-management-engineering/ with changes highlighted in yellow as shown below. 3. Major Requirements – Elective Modules (16MCs, selected from the list below) Not all electives modules may be offered in any semester/year. An elective module may not be offered if there is insufficient number of students opting for that module at any particular time. ▪ TIE4220 Supply Chain Modelling ▪ TIE4230 Quality Engineering II ▪ TIE4242 Cost Analysis and Management ▪ TIE4229 Selected Topics in Logistics ▪ TIE4239 Selected Topics in Quality Engineering ▪ TIE4249 Selected Topics in Engineering Management ▪ TIE4259 Selected Topics in Systems Engineering ▪ TIE4299 Selected Topics in Industrial Engineering ▪ TME4209 Management of New Product Development ▪ IE5108 Facility Layout and Location ▪ IE5121 Quality Planning and Management ▪ IE5203 Decision Analysis ▪ IE5301 Human Factors in Engineering and Design In the rare event that a student is unable to secure sufficient number of electives from the above list to complete their requirements, permission may be granted by the Dean of SCALE for the student to select one Level-3000 or higher module from other programmes (e.g. IE5108 Facility Layout and Location, IE5121 Quality Planning and Management, IE5203 Decision Analysis, IE5301 Human Factors in Engineering and Design) within the Faculty of Engineering.

22.	24 Jul 2017	FoD	FACULTY OF DENTISTRY – KEY CONTACT INFORMATION (updated)

Deanery

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Prof Patrick Finbarr ALLEN	Dean	24989	dendean
Assoc Prof WONG Mun Loke	Vice Dean, Academic Affairs	26834	denvdaa
Assoc Prof CAO Tong	Vice Dean, Research	26845	denvdr
Assoc Prof LIM Ah Tong Asher	Vice Dean, Clinical Affairs	26844	denvdca
Assoc Prof YU Soo Hoon Victoria	Vice Dean, Graduate Studies	24962	denvdgs
Assoc Prof Catherine HONG	Assistant Dean, Education	11787	denchhl

Discipline Directors / Directors of Division

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof CAO Tong	Oral Sciences	26845	dencaot
Assoc Prof LIM Ah Tong Asher	Oral & Maxillofacial Surgery	26844	denalat
Assoc Prof NEO Chiew Lian Jennifer	Endodontics, Operative Dentistry & Prosthodontics	26840	dennnj
Assoc Prof LIM Lum Peng	Periodontics	26839	denlimlp
Assoc Prof FOONG Weng Chiong Kelvin	Orthodontics & Paediatric Dentistry	26843	denfwc
Assoc Prof YU Soo Hoon Victoria	Director, Division of Graduate Dental Studies	24962	gdshead

Programme Coordinators for Undergraduate Programmes

Oral Sciences

Title & Name	Designation / Responsibility	Telephone	Email

Dr Chaminda Jayampath SENEVIRATNE	Oral Biology	11790	denchjs
Assoc Prof WONG Mun Loke	Preventive Dentistry & Dental Public Health	26834	denwml
Dr Vinicius ROSA	Dental Materials	11650	denvr

Oral & Maxillofacial Surgery

Title & Name	**Designation / Responsibility**	**Telephone (677X-XXXX)**	**Email (xxxx@nus.edu.sg)**
Dr Raymond WONG	Oral & Maxillofacial Surgery	11612	denrwcw
Assoc Prof Catherine HONG	Oral Maxillofacial Radiology & Pathology	11787	denchhl
Dr Andrew ROBINSON	Oral Medicine	-	denrna

Endodontics / Operative Dentistry / Prosthodontics

Title & Name	**Designation / Responsibility**	**Telephone (677X-XXXX)**	**Email (xxxx@nus.edu.sg)**
Dr TAN Hee Hon	Prosthodontics (Fixed & Removable Prosthodontics)	11793	dentanh
Dr Benny GOH	Endodontics	-	dengkcb
Assoc Prof NEO Chiew Lian Jennifer	Operative Dentistry	26840	dennnj

Periodontics

Title & Name	**Designation / Responsibility**	**Telephone (677X-XXXX)**	**Email (xxxx@nus.edu.sg)**
Dr FU Jia Hui	Periodontics	11649	denfjh

Orthodontics and Paediatric Dentistry

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof FOONG Weng Chiong Kelvin	Orthodontics	26843	denfwc
Dr MOK Yuen Yue Betty	Paediatric Dentistry	26835	denmokyy

Dean's Office – Integrated Courses

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof LIM Lum Peng	Behavioural Science	26839	denlimlp
Assoc Prof WONG Mun Loke	Cariology	26834	denwml
Assoc Prof WONG Mun Loke	General Practice Management	26834	denwml
Assoc Prof TAN Beng Choon Keson	Occlusion	26833	dentanbc
Assoc Prof LIM Lum Peng	Problem-Based Learning	26839	denlimlp

Programme Directors for Master of Dental Surgery (M.D.S.) Residency Training Programmes

Endodontics

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof YU Soo Hoon Victoria	Endodontics	24962	denyshv

Orthodontics

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof FOONG Weng Chiong Kelvin	Orthodontics	26843	denfwc

Periodontics

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof LIM Lum Peng	Periodontics	26839	denlimlp

Prosthodontics

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof TAN Beng Choon Keson	Prosthodontics	26833	dentanbc

Paediatric Dentistry

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Dr FU Jia Hui	Paediatric Dentistry	11649	denfjh

Oral & Maxillofacial Surgery

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Assoc Prof LIM Ah Tong Asher	Oral & Maxillofacial Surgery	26844	denalat

General Enquiry – Dean's Office

Title & Name	Designation / Responsibility	Telephone (677X-XXXX)	Email (xxxx@nus.edu.sg)
Perina CHIANG	Education	25341	dencip
Nurazreen MOHD ZAID	Research (Grants / Admin)	24968	dennmz
XU Jing Hong	Research (Clinical)	26842	denxjh
Sharon LIM	Giving	24937	denltas
Shevonne ANG	Media Relations	26426	denakx

23.	19 Jul 2017	SDE	URL: http://www.nus.edu.sg/nusbulletin/school-of-design-and-environment/undergraduate-education/degree-requirements/b-sc-project-facilities-management-hons-programme/

Table 1: Curriculum Structure of the BSc (Project and Facilities Mgt) (Hons) Programme for students admitted from AY2017/18 onwards

No.	Modules	MCs
1	**UNIVERSITY REQUIREMENTS**	**20**
1.1	General Education Modules (GEM)^ Students will be required to read one GEM from each of the following five pillars	
a	**H**uman Cultures (GEH)	4
b	Asking **Q**uestions (GEQ)	4
c	Quantitative **R**easoning (GER)	4
d	**S**ingapore Studies (GES)	4
e	**T**hinking and Expression (GET)	4
2	**PROGRAMME REQUIREMENTS**	~~**120**~~ **108**
a	Essential modules	48
b	Project Management modules	~~28~~ 20 min.
c	Facilities Management modules	~~24~~ 20 min.
d	Technology Core	12 min.
e	*1 Dissertation OR **Any 2 Programme Electives (for students who are not taking Dissertation)	8
3	**UNRESTRICTED ELECTIVES (UE)**	~~**20**~~ **32**

			Total	**160**

Note:
^ Please refer to GEM website (http://www.nus.edu.sg/registrar/gem/important-information-students) for more details on the GEM requirements.

* Dissertation track (students with CAP 3.50 and above upon completion of 80 MCs):
28 25 modules (112 100 MCs) + 1 Dissertation (8 MCs) = 29 26 modules (120 108 MCs).

**Non-dissertation track (students with CAP below 3.50 upon completion of 80 MCs):
28 25 modules (112 100MCs) + 2 programme electives (8 MCs) = 30 27 modules (120 108 MCs)

Table 2: BSc (Project and Facilities Mgt) Programme Structure

	Level 1		Level 2		Level 3		Level 4	
	Sem 1	**Sem 2**	**Sem 3**	**Sem 4**	**Sem 5**	**Sem 6**	**Sem 7**	**Sem 8**
Essential	PF1101 Fundamentals of Project Management (4 MCs)	PF1103 IT and BIM for Projects (4 MCs)	PF2101 Project & Facilities Management Law (4 MCs)	PF2103 Measurement (Building Works) (4 MCs)				PF4101 Dissertation (with CAP of 3.5 and above) (8 MCs)
	PF1102 Visualisation in Design and Technology (4 MCs)	PF1104 Environmental Science for Building (4 MCs)	PF2106 Project and Facilities Communication Management (4 MCs)	PF2105 Research Methods (4 MCs)			PF4102 Contract and Procurement Management (4 MCs)	
		PF1105 Fundamentals of Facilities Management (4 MCs)	PF2107 Construction Technology (4 MCs)	PF2108 Project Cost Management (4 MCs)				

			Project Management			PF2201 Scope and Design Management (4 MCs)	PF2203 Quality and Productivity Management (4 MCs)	PF3205 Advanced Measurement (Pre-req: PF2501) (4 MCs)	PF3201 Measurement (Specialist Works) (Pre-req: PF2503) (4 MCs)	PF4202 Safety, Health and Environmental Management (4 MCs)	PF4203 Project Dispute Management (4 MCs)
						PF2204 Project Development and Finance (4 MCs)		PF3206 Project Scheduling and Control (4 MCs)	PF3207 Project Management Law (4 MCs)	PF4206 Building Information Modelling (4 MCs)	PF4207 Project Risk Management (4 MCs)
			Facilities Management^				PF2304 Operations and Maintenance Management (4 MCs)	PF3301 Maintainability of Facilities (4 MCs)	PF3304 Facilities Management Law (4 MCs)	PF4301 Strategic Facilities Management (4 MCs)	PF4305 Green Development (4 MCs)
								PF3302 Energy Management (Pre-req: PF2503) (4 MCs)	PF3305 Facilities Planning and Design (Pre-req: PF2501) (4 MCs)	PF4307 Event Management (4 MCs)	PF4308 Event Management Case studies (4 MCs)
			Technology			PF2501 Structural Systems (4 MCs)	PF2503 M&E Engineering Systems (4 MCs)		PF3501 Intelligent Facilities (4 MCs)		PF4501 Total Building Performance (4 MCs)
						PF2502 Development Technology and Management (4 MCs)	PF2504 Materials Technology (4 MCs)				
			General Education Modules (GEM) – 20 MCs Unrestricted Electives (within/outside SDE) (UE) – ~~20~~ 32 MCs								

^ Students may take PF3401 Practical Training Scheme to fulfil their Facilities Management requirement. Please refer to PTS website (http://www.bdg.nus.edu.sg/undergraduate/PFM-PTS.html) for more details about the PTS.

24.	28 Jun 2017	FoE	At http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-industrial-and-systems-engineering/degree-requirements/ Please see changes in **red** fonts: Update 1 Students in the Bachelor of Engineering (Industrial & Systems Engineering) programme are required to fulfil the following requirements to graduate from the programme: • Complete a minimum of ~~161~~ 160 MCs with a CAP ≥ 2.0; • Pass the modules in accordance with Table 3.2.8a, 3.2.8b and 3.2.8c for Practicing Professional, Research-focused and Innovation & Design Centric Pathways, respectively; • Satisfy all other requirements as prescribed by the Faculty of Engineering or the University.

Update 2

Table 3.2.8a: Summary of Modular Requirements and Credits for Practicing Professional Pathway (PPP)

Modular Requirements	MCs	MCs	MCs
ISE Major Requirements	~~75~~ 74	~~75~~ 74	~~75~~ 74
IE1111 Industrial & Systems Engineering Principles & Practice I	6	6	6
IE1112 Industrial & Systems Engineering Principles & Practice II	6	6	6
IE2100 Probability Models with Applications	4	4	4
IE2110 Operations Research I	4	4	4
IE2130 Quality Engineering I	4	4	4
IE2140 Engineering Economy	4	4	4
IE2150 Human Factors Engineering	4	4	4
IE3100M Systems Design Project	12	12	12
IE3101 Statistics for Engineering Applications	4	4	4
~~IE3110~~ IE3110R Simulation	~~5~~ 4	~~5~~ 4	~~5~~ 4
IE4100R ~~B.Eng~~ BEng Dissertation	–	8	–
IE4102 Independent Study Module	4	–	4
~~EG3611~~ EG3611A Industrial Attachment Programme [2]	–	–	10
EG3612 Vacation Internship Programme [2]	6	6	–

ISE Electives (see Table 3.2.8e)	12	8	8
Pathway Requirements (PPP)	8	8	8
IE4211 Industrial Modeling and Analytics	4	4	4
IE4240 Project Management	4	4	4
Total	~~161~~ 160	~~161~~ 160	~~161~~ 160

Update 3

Table 3.2.8b: Summary of Modular Requirements and Credits for Research-focused Pathway (R*f*P)

Modular Requirements	MCs
ISE Major Requirements	~~75~~ 74
IE1111 Industrial & Systems Engineering Principles & Practice I	6
IE1112 Industrial & Systems Engineering Principles & Practice II	6
IE2100 Probability Models with Applications	4
IE2110 Operations Research I	4
IE2130 Quality Engineering I	4
IE2140 Engineering Economy	4
IE2150 Human Factors Engineering	4
IE3100M Systems Design Project	12
IE3101 Statistics for Engineering Applications	4
~~IE3110~~ IE3110R Simulation	~~5~~ 4
IE4100R ~~B.Eng~~ BEng Dissertation	8
EG3612 Vacation Internship Programme [2]	6
ISE Electives (see Table 3.2.8e)	8

Pathway Requirements (R*f*P)	8
IE5xxx/IE6xxx (see Table 3.2.8d)	4
IE5xxx/IE6xxx (see Table 3.2.8d)	4
Total	~~161~~ 160

Update 4

Table 3.2.8c: Summary of Modular Requirements and Credits for Innovation & Design Centric Pathway (*i*DCP)

Modular Requirements	MCs
ISE Major Requirements	~~75~~ 74
IE1111 Industrial & Systems Engineering Principles & Practice I	6
IE1112 Industrial & Systems Engineering Principles & Practice II	6
IE2100 Probability Models with Applications	4
IE2110 Operations Research I	4
IE2130 Quality Engineering I	4
IE2140 Engineering Economy	4
IE2150 Human Factors Engineering	4

IE3100M Systems Design Project	12
IE3101 Statistics for Engineering Applications	4
~~IE3110~~ IE3110R Simulation	~~5~~ 4
IE4100R ~~B.Eng~~ BEng Dissertation	8
EG3612 Vacation Internship Programme [2]	6
ISE Electives (see Table 3.2.8e)	8
Pathway Requirements (*i*DCP)	8
Innovation & Enterprise Electives	8
Total	~~161~~ 160

Innovation & Design Centric Pathway

- *i*DCP students will have to do a design project (EG3301R - 12MCs), FYP (EG4301 - 12MCs) and a 12-week internship (EG3612 - 6MCs).
- For mapping of *i*DCP modules to ISE modules and pathway requirements (8MCs), please refer to the *i*DCP website.

Update 5

Table 3.2.8d: Basket of Modules for Research-focused Pathway Requirements

Modules
IE5108 Facility Layout and Location
IE5202 Applied Forecasting Systems
IE5203 Decision Analysis
IE5205 Healthcare Systems and Analytics
IE5213 Service Innovation and Management
IE5407 Flexibility in Engineering Systems Design
IE6001 Mathematical Programming for Engineering
IE6002 Advanced Engineering Statistics
IE6005 Stochastic Models and Optimization

25.	28 Jun 2017	FoE	At http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-industrial-and-systems-engineering/degree-requirements/ Please see changes in red fonts: Update 1 Students in the Bachelor of Engineering (Industrial & Systems Engineering) programme are required to fulfil the following requirements to graduate from the programme: • Complete a minimum of 161 160 MCs with a CAP ≥ 2.0; • Pass the modules in accordance with Table 3.2.8a, 3.2.8b and 3.2.8c for Practicing Professional, Research-focused and Innovation & Design Centric Pathways, respectively; • Satisfy all other requirements as prescribed by the Faculty of Engineering or the University.

<table>
<tr>
<td>26.</td>
<td>28 Jul 2017</td>
<td>FoE</td>
<td>
NUS Bulletin 2017/18 – Common Engineering
http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-programme/common-engineering/

In the first year of study, common engineering students are required to read:

MA1505 Mathematics I
MA1512 Differential Equations for Engineering
MA1513 Linear Algebra with Differential Equations
GER1000 Quantitative Reasoning (GE 1)
GE in Thinking & Expression
CS1010E Programming Methodology (mapped to CE2409 for students who enter Civil/Environmental Engineering)
Engineering Principles and Practice I & II (EG1111 & EG1112)\

Any of the following physics, engineering, and chemistry modules for entry into the various engineering programmes

• PC1431 Physics IE
• PC1432 Physics IIE
• CM1502 General and Physical Chemistry for Engineers

Table 3.1.4 shows the modules that common engineering students with H2 Chemistry/ H2 Physics are required to read to qualify to apply for entry into the various engineering programmes. Common Engineering students with H2 Chemistry who plan to apply for Chemical Engineering or Environmental Engineering should read CM1502. Students should carefully choose a combination of Physics, Chemistry and Engineering modules which would qualify them to apply for entry intoat least three engineering disciplines. Common Engineering students who have not read one or more of the required modules for an engineering discipline of interest may still be considered for the various disciplines on a case by case basis.

TABLE 3.1.4: PHYSICS, CHEMISTRY AND ENGINEERING MODULES REQUIRED TO BE READ BY COMMON ENGINEERING STUDENTS TO QUALIFY FOR THE VARIOUS ENGINEERING DISCIPLINES
<table>
<tr><th>Engineering Programme</th><th>Physics Modules</th><th>Engineering Modules</th><th>Chemistry Modules</th></tr>
<tr><td>Biomedical</td><td>PC1432</td><td></td><td>–</td></tr>
</table>
</td>
</tr>
</table>

Chemical	–	-	CM1502	
Civil	PC1431		–	
Electrical	–	–	–	
Computer			–	
Environmental	PC1431		CM1502	
Industrial & Systems	–	-	–	
Mechanical	PC1431	–	–	
Materials Science	PC1432	-	–	

Students who have decided not to enter Mechanical Engineering and Electrical Engineering programmes will be allowed to opt out of EG1111 & EG1112, and to take Engineering Principles and Practice (EPP) modules from other engineering programmes of interest.
For students who have not decided on which engineering programmes to enter, it is advisable to take EG1111 & EG1112 to keep their options open.

<table>
<tr>
<td>27.</td>
<td>28 Aug 2017</td>
<td>FoE</td>
<td>
http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-chemical-engineering/degree-requirements/

3.2.2.2 Degree Requirements
The following are the requirements for the degree of BEng (ChE):

Students in the BEng (ChE) programme are required to complete a minimum of 162 160 MCs with a CAP ≥ 2.0 to graduate from the programme.
162 MCs will have to be earned by reading modules in accordance with Table 3.2.2a.
Students are free to choose any combination of the offered modules technical electives from Table 3.2.2b to satisfy the technical electives elective and pathway requirements.
A student may choose to specialise in Biomolecular Engineering or Process Systems Engineering by taking 4 technical electives from the specified basket of electives and the BEng Dissertation (Research Project) in the specialisation area.
A student must also satisfy other additional requirements that may be prescribed by the Faculty of Engineering or the University.
There are three engineering pathways, namely, (a) Research-Focused Pathway (RfP) (b) Innovation & Design-Centric Programme Pathway (iDCP) and (c) Practicing Professional Pathway (PPP). Please refer to Table 3.2.2c below.
The default pathway is PPP for all students (no action required). If students want to select RfP or iDCP pathways, they have to obtain Department’s approval and fulfil all requirements to graduate.

Table 3.2.2a: Summary of Modular Requirements and Credits
<table>
<tr><th>Modular Requirements</th><th>MC</th></tr>
<tr><td>University Level Requirements</td><td>20</td></tr>
<tr><td>General Education Modules (GE) (5 Modules, each of 4MCs)</td><td>20</td></tr>
</table>
</td>
</tr>
</table>

			Human Cultures (HC) Quantitative Reasoning (QR) Thinking and Expression (T&E) Singapore Studies (SS) Asking Questions (AQ)	
			Unrestricted Electives[1]	~~**20**~~ **32**
			Programme Requirements	
			Faculty Requirements:	~~**11**~~ **6**
			ES1531 Critical Thinking & Writing[1] [2]	4
			~~ES2331 Communicating Engineering~~	~~4~~
			EG2401 Engineering Professionalism	~~3~~ 2
			Foundation Requirements:	~~**24**~~ **10**
			~~MA1505~~ MA1511 ~~Mathematics I~~ Engineering Calculus	~~4~~ 2
			~~MA1506~~ MA1512 ~~Mathematics II~~ Differential Equations for Engineering	~~4~~ 2
			MA1513 Linear Algebra with Differential Equations	2
			CM1502 General and Physical Chemistry for Engineers	4
			~~LSM1401 Fundamentals of Biochemistry~~	~~4~~
			~~MLE1101 Introductory Materials Science & Engineering~~	~~4~~
			~~IT1005 Introduction to Programming with Matlab~~	~~4~~

			Chemical Engineering Major Requirements:	~~87~~ **80**
			CHE Core Subjects:	~~55~~ 64
			~~CN1111~~ CN1101 ~~Chemical Engineering Principles~~ Chemical Engineering Principles and Practice I	~~4~~ 6
			CN1102 Chemical Engineering Principles and Practice II	6
			~~CN2108 Chemical Engineering Laboratory I~~	~~2~~
			CN2101 Material and Energy Balances	3
			CN2116 Chemical Kinetics and Reactor Design	4
			CN2121 Chemical Engineering Thermodynamics	4
			CN2122 Fluid Mechanics	~~4~~ 5
			CN2125 Heat and Mass Transfer	4
			~~CN3108~~ CN3101 Chemical Engineering Laboratory ~~II~~ I	4
			~~CN3109~~ CN3102 Chemical Engineering Laboratory ~~III~~ II	~~2~~ 4
			~~CN3124 Fluid-Solid Systems~~	~~3~~
			CN3121 Process Dynamics and Control	4
			CN3132 Separation Processes	4
			CN3135 Process Safety, Health & Environment	3
			CN3421 Process Modelling and Numerical Simulation	4

			CN4122 Process Synthesis and Simulation	3
			CN4123R Final Year Design Project	6
			~~CHE Technical Electives/BEng Dissertation[2]~~ **B.Eng. (CHE) - Technical Electives & Pathway Requirement Modules[3] (from Table 3.2.2b)**	~~20~~ **16**
			~~CN4118 BEng Dissertation or 2 Technical Electives (from Table 3.2.2b)~~	~~8~~
			~~3 Technical Electives (from Table 3.2.2b)~~	
			EG3611 Industrial Attachment[3] [4]	**12**
			Total	~~**162**~~ **160**

124MC of UEM for students in RfP, 6MC of UEM for students in iDCP
2Students who score a Band 1 or Band 2 in Qualifying English Test (QET) will need to take ES1103 English for Academic Purposes (4 MC) before taking ES1531 Critical Thinking & Writing. ES1103 will be counted as 1 UEM. BEng students are required to read a Critical Thinking & Writing module (Compulsory ES1531 Critical Thinking & Writing) and a Communications module (ES2331 Communicating Engineering). Alternatively, students can read ES1501X Academic Expository Writing in place of both ES1531 and ES2331. USP/UTRP/RVRC students should refer to their respective programmes for USP/UTRP/RVRC modules to be read in place of ES1531 and/or ES2331.
2 CN4118 BEng Dissertation is optional. Interested students can take CN4118 (8MC), and others can take 2 Technical Electives, each of 4MC, in lieu of CN4118.
3Students in RfP are required to take two Level 4000 technical electives, two Level 5000 technical electives and CN4118 B.Eng. Dissertation.
Students in iDCP are required to take one Level 4000/5000 technical elective.
Students in PPP are required to take two Level 4000/5000 technical electives and two professional requirement modules. The following technical elective modules can be used to fulfil the professional requirement:
CN4201R: Petroleum Refining
CN4205R: Pinch Analysis and Process Integration
CN4227R: Advanced Process Control
CN4233R: Good Manufacturing Practices in Pharmaceutical Industry
CN4251: Troubleshooting with Case Studies for Process Engineers
CN5191: Project Engineering
Alternatively, it can be accomplished by using modules from minor or double majors, subjected to approval.

3 For BEng students in the following special programmes: DDPs, CDPs, GEP & CSP, internship/industrial-attachment is optional and the modular credits for the internship/industrial-attachment will be become 'Free Electives' i.e., Unrestricted Electives (UE).
3Industrial Attachment is optional for students in the following special programmes:
-Double Degree Programme (DDP)
-Concurrent Degree Programme (CDP)
-Global Engineering Programme (GEP)
-Polytechnic direct-intake students

Table 3.2.2b: Technical Elective & Pathway Requirement Modules in ChE#

CN4201R	Petroleum Refining	4
CN4203R	Polymer Engineering	4
CN4205R	Pinch Analysis and Process Integration	4
CN4211R	Petrochemicals and Processing Technologies	4
CN4215R	Food Technology and Engineering	4
CN4216R	Electronics Materials Science	4
CN4217R	Processing of Microelectronic Materials	4
CN4221R	Control of Industrial Processes	4
CN4223R	Microelectronic Thin Films	4
CN4227R	Advanced Process Control	4
CN4233R	Good Manufacturing Practices in Pharmaceutical Industry	4
CN4238R	Chemical & Biochemical Process Modeling	4
CN4240R	Unit Operations and Processes for Effluent Treatment	4

			CN4241R	Engineering Principles for Drug Delivery	4
			CN4245R	Data Based Process Characterization	4
			CN4246R	Chemical & Bio-Catalysis	4
			CN4247R	Enzyme Technology	4
			CN4248	Sustainable Process Development	4
			CN4249	Engineering Design in Molecular Biotechnology	4
			CN4250	Chemical Product Design	4
			CN4251	Troubleshooting with Case Studies for Process Engineers	4
			CN4291	Selected Topics in Chemical Engineering	4
			CN5111	Optimization of Chemical Processes	4
			CN5172	Biochemical Engineering	4
			CN5173	Downstream Processing of Biochemical and Pharmaceutical Products	4
			CN5181	Computer-Aided Chemical Engineering	4
			CN5186	Design and Operation of Process Networks	4
			CN5191	Project Engineering	4
			CN5222	Pharmaceuticals and Fine Chemicals	4
			CN5251	Membrane Science and Engineering	4

			CN4118 B.Eng. Dissertation 8 Biomolecular Engineering CN4233R Good Manufacturing Practices in Pharmaceutical Industry CN4238R Chemical and Biochemical Process Modeling CN4241R Engineering Principles for Drug Delivery CN4246R Chemical and Bio-Catalysis CN4247R Enzyme Technology CN4249 Engineering Design in Molecular Biotechnology CN5172 Biochemical Engineering Process Engineering CN4205R Process Systems Engineering CN4227R Advanced Process Control CN4245R Data Based Process Characterisation CN4248 Sustainable Process Development CN4250 Chemical Product Design CN5111 Optimisation of Chemical Processes CN5181 Computer Aided Chemical Engineering CN5185 Batch Process Engineering CN5186 Design and Operation of Process Networks CN5191 Project Engineering ESP4402 Transport Phenomena in Energy Systems Process Technology CN4201R Petroleum Refining CN4203R Polymer Engineering CN4211R Petrochemicals and Processing Technologies CN4215R Food Technology and Engineering CN4240R Unit Operations and Processes for Effluent Treatment CN4291 Selected Topics in Chemical Engineering CN5173 Downstream Processing of Biochemical and Pharmaceutical Products CN5222 Pharmaceuticals & Fine Chemicals CN5251 Membrane Science and Engineering Others BN4404 Bioelectromechanicals systems – BioMEMs CN4216R Electronics Materials Science CN4217R Processing of Microelectronic Materials

CN4223R Microelectronic Thin Films

The department reserves the right to decide on the modules to be offered in any given semester.

Table 3.2.2c: Three Engineering Pathways

R*f*P	***i*DCP**	**PPP**
Year 1 and Core Modules (74 MC)	Year 1 and Core Modules (74 MC)	Year 1 and Core Modules (74 MC)
MA1511, MA1512, MA1513, CN1101, CN1102, CM1502, CN2101, CN2121, CN2122, CN2125, CN2116, CN3101, CN3102, CN3121, CN3132, CN3421, CN3135, CN4122, CN4123R	MA1511, MA1512, MA1513, CN1101, CN1102, CM1502, CN2101, CN2121, CN2122, CN2125, CN2116, CN3101, CN3102, CN3121, CN3132, CN3421, CN3135, CN4122, CN4123R	MA1511, MA1512, MA1513, CN1101, CN1102, CM1502, CN2101, CN2121, CN2122, CN2125, CN2116, CN3101, CN3102, CN3121, CN3132, CN3421, CN3135, CN4122, CN4123R
IA (12 MC)	VIP (6 MC)	IA (12 MC)
Two 4000 electives (8 MC)	EG2201A Introduction to Design Thinking (4 MC)	Two 4000/5000 electives (8 MC)
Pathway requirement – Two 5000 electives (8 MC)	EG2301 Case Studies in Engineering (4 MC)	Pathway requirement (8 MC)
B. Eng. Dissertation (8 MC)	EG3301R Design Project (12 MC)	
	EG4301 DCP Dissertation (12 MC)	
	Innovation and Enterprise Electives (3×4 MC)	
	One 4000/5000 elective (4 MC)	
Faculty Requirement (ES1531 and EG2401, 6 MC)		

GE (20 MC)		
UEM (24 MC)	UEM (6 MC)	UEM (32 MC)
160 MC	**160 MC**	**160 MC**

http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-chemical-engineering/recommended-semester-schedule/

The recommended semester schedules for direct entry Chemical Engineering students and Common Engineering Entry students are presented in Table 3.2.2c.

Table 3.2.2c: Recommended Semester Schedule for Direct Entry ChE Students

Modules	MCs	Modules	MCs
Semester 1		**Semester 2**	
~~ES1531 Critical Thinking & Writing~~[1]		~~GE on QR~~	
CN1101 Chemical Engineering Principles and Practice I	~~4~~ 6	CN1102 Chemical Engineering Principles and Practice II	~~4~~ 6
~~GE on HC OR CN1111 Chemical Engineering Principles~~	~~4~~ 2	~~CM1502 General and Physical Chemistry for Engineers~~	~~4~~ 2
MA1511 Engineering Calculus		MA1512 Differential Equations for Engineering	
~~IT1005 Introduction to Programming with Matlab~~	4	~~CN1111 Chemical Engineering Principles or GE on HC~~	~~4~~ 2
GE on T&E		MA1513 Linear Algebra with Differential Equations	
~~MA1505 Mathematics~~	~~4~~ 4	~~MA1506 Mathematics II~~	
GE on SS		CM1502 General and Physical Chemistry for Engineers	4
UEM – 1	4	GE on QR	4
		~~MLE1101 Introductory Materials Science and Engineering~~	~~4~~
Sub-total	**20**	**Sub-total**	**~~20~~ ~~18~~**
Semester 3		**Semester 4**	
CN2101 Material and Energy Balances	3	CN2125 Heat and Mass Transfer	4

			CN2121 Chemical Engineering Thermodynamics	4	~~CN2108 Chemical Eng Lab I~~ CN2116 Chemical Kinetics and Reactor Design	~~2~~ 4
			CN2122 Fluid Mechanics	~~4~~ 5	~~CN2116 Chemical Kinetics and Reactor Design~~ EG2401 Engineering Professionalism	~~4~~ 2
			~~LSM1401 Fundamentals of Biochemistry~~	~~4~~	~~CN2125 Heat and Mass Transfer~~ UEM - 2	4
			~~ES2331 Communicating Engineering~~ ES1531 Critical Thinking & Writing[1]	4	~~CN3124 Fluid-Solid Systems~~ UEM - 3	~~3~~ 4
			~~GE on T&E~~ GE on AQ	4	~~EG2401 Engineering Professionalism~~ GE on HC	~~3~~ 4
					~~UE 1~~	~~4~~
			Sub-total	**20**	**Sub-total**	**~~20~~ 22**
			Semester 5		**Semester 6#**	
			~~CN3108 Chemical Eng Lab II~~ CN3101 Chemical Engineering Lab I	4	~~CN3109 Chemical Eng Lab III~~ CN3102 Chemical Engineering Lab II	~~2~~ 4
			CN3121 Process Dynamics and Control	4	~~^CN4118 BEng Dissertation or Technical Elective~~ CN4122 Process Synthesis and Simulation	~~4~~ ~~7~~ 3
			CN3132 Separation Processes	4	~~CN4122 Process Synthesis and Simulation~~ Technical Elective 1	~~3~~ 4
			CN3135 Process Safety, Health & Environment	3	~~UE 2~~ Technical Elective 2	4
			CN3421 Process Modelling and Numerical Simulation	4	~~GE on AQ~~ UEM - 4	4
					~~UE 3 (can be taken in Special Term to have a lower workload in this semester)~~ UEM - 5	4
			Sub-total	**19**	**Sub-total**	~~21 24~~ **23**
			Semester 7#		**Semester 8**	
			~~Technical Elective 1~~	~~4~~	~~^CN4118 BEng Dissertation (continued) or Technical Elective~~ CN4123R Final Year Design Project	~~1~~ ~~4~~ 6
			~~Technical Elective 2~~	~~4~~	~~CN4123R Design Project~~	~~6~~ 4

					Pathway Requirement 2	
			EG3611 Industrial Attachment	12	~~Technical Elective 3~~ UEM - 6	4
			Pathway Requirement 1	4	~~UE 4~~ UEM - 7	4
					~~UE 5~~ UEM - 8	4
			Sub-total	~~**20**~~ **16**	**Sub-total**	~~19 22~~ **22**

1Students who score a Band 1 or Band 2 in Qualifying English Test (QET) will need to take ES1103 English for Academic Purposes (4MC) before taking ES1531 Critical Thinking & Writing. ES1103 will be counted as 1 UEM
#Modules scheduled in Semesters 6 and 7 can be swapped, thus students can also choose to go on IA Industrial Attachment in Semester 6.
^CN4118 BEng Dissertation is optional. Interested students can take CN4118 (8MC), and others can take 2 Technical Electives, each of 4MC in-lieu of CN4118.

http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-chemical-engineering/

3.2.2.1 Overview
3.2.2.2 Degree Requirements
3.2.2.3 Recommended Semester Schedule
3.2.2.4 The Chemical Sciences Programme

NOTE:
Please kindly remove the following page:
http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-chemical-engineering/the-chemical-sciences-programme/

<table>
<tr>
<td>28.</td>
<td>29 Aug 2017</td>
<td>FoE</td>
<td>JMDP/CEG – Updates for Bulletin AY2017/18

1. http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/bachelor-of-engineering-computer-engineering-programme/overview/

(second paragraph, fifth sentence)
… Graduates will have the opportunity to consolidate this experience through a unique long-term year-long industrial attachment, and through overseas work and/or learning experience.

2. http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/bachelor-of-engineering-computer-engineering-programme/degree-requirements/

a) (third paragraph, third sentence)
… These core modules provide the essential foundation for a variety of specialised focused technical areas in CEG. During their senior years of study, students may choose from a wide variety of electives to enable them to specialise focus in certain fields of CEG.

b) table 1, under ‘Programme Requirements’
<table><tr><td>EE3204</td><td>Computer Communication Networks I</td><td>4</td></tr><tr><td><s>EG240#</s> EG2401A</td><td>Engineering Professionalism</td><td>2</td></tr><tr><td>MA1508E</td><td>Linear Algebra for Engineering</td><td>4</td></tr></table>
c) (second paragraph, first line)
Students are encouraged to specialise may focus in one of the following concentrations –

d) (second last paragraph)
The rules are as follows: To achieve depth, CEG students in Practising Professional Pathway (PPP) or Research-focused Pathway (RfP) need to read a minimum of three 12 MCs depth electives. Students in Innovation & Design-Centric Programme (iDCP) need to read a minimum 8 MCs depth electives. Students may read breadth electives to achieve …</td>
</tr>
</table>

<table>
<tr>
<td>29.</td>
<td>5 Sep 2017</td>
<td>FoE</td>
<td>
Changes required to AY1718 Bulletin - changes to Bachelor of Engineering (Electrical Engineering)
3.2.5.2 Degree Requirements
Home / NUS Bulletin AY2017/18 / Faculty of Engineering / Undergraduate Education / Bachelor of Engineering Degree Programmes / Bachelor of Engineering (Electrical Engineering) / Degree Requirements

Students in the BEng (Electrical Engineering) programme are required to complete a minimum of 160 MCs with a CAP ≥ 2.0 to graduate. In the first stage of the programme, students will receive broad-based training which, in addition to establishing a strong foundation in mathematics and computing, will also be immediately exposed to the use of electrical components and equipment in solving fundamental engineering problems in EE. They will also be introduced to the different areas in EE which are driving the technological developments of today.
In the second stage, students will enroll in core modules that focus on fundamental knowledge in EE. These core modules provide the essential foundation for a variety of specialised technical areas in EE. During their senior years of study, students may specialise in certain fields of EE through their selection of 28 MCs of elective modules. Throughout their programme, they are also expected to broaden their views by reading some general education modules, Engineering Professionalism and Critical Thinking and Writing Students are strongly encouraged to make good use of the 32 MCs of UEM by taking more technical electives to further explore their engineering interest through EE specialisations, or other interest by taking a minor or second major The complete programme structure is specified in Table 3.2.5a.

Table 3.2.5a: Summary of EE Modular Requirements and Credits

<table>
<tr><th>MODULAR REQUIREMENTS</th><th>MCS</th></tr>
<tr><td>University Level Requirements (ULR) – General Education (GE) Modules
Human Cultures (GEH)
Quantitative Reasoning (GER)
Thinking and Expression (GET)
Singapore Studies (GES)
Asking Questions (GEQ)</td><td>20</td></tr>
<tr><td>Unrestricted Electives (UE) ++</td><td>32</td></tr>
<tr><td>Programme Requirements</td><td></td></tr>
<tr><td>Faculty Requirements:</td><td>6</td></tr>
</table>
</td>
</tr>
</table>

ES1531	Critical Thinking & Writing[1]			4
EG2401A	Engineering Professionalism			2
Foundation Requirements:				16
MA1511	Engineering Calculus			2
MA1512	Differential Equations for Engineering			2
MA1508E	Linear Algebra for Engineering			4
IT1007	Introduction to Programming with Python and C			4
PC2020	Electromagnetics for Electrical Engineers			4
Electrical Engineering Major Requirements				
EE Core Subjects:				40
EG1111	Engineering Principles & Practice I			6
EG1112	Engineering Principles & Practice II			6
EE2012	Analytical Methods in Electrical and Computer Engineering			4
EE2023	Signals and Systems			4
EE2026	Digital Design			4
EE2027	Electronic Circuits			4
EE2028	Microcontroller Programming and Interfacing			4
EE2033	Integrated Systems Lab			4

EE3031 Innovation & Enterprise I	4
EE Project Modules:	18
EE4002D/EE4002R Capstone Project	8
EG3611A Industrial Attachment[2]	10
EE Electives:	
Elective Modules from Tables 3.2.5b and 3.2.5c to satisfy the outer core and technical elective requirements of the BEng (EE) programme.	28
Total	160

++ EE students are strongly encouraged to take more technical electives to further explore their engineering interest through EE specialisations, or other interest by taking a minor or second major.

1 BEng students are required to read a Critical Thinking & Writing module (ES1531 Critical Thinking & Writing). Alternatively, students can read ES1501X Academic Expository Writing in place of both ES1531. USP/UTRP/RVRC students should refer to their respective programmes for USP/UTRP/RVRC modules to be read in place of ES1531. For students who does not meet the pre-requisite of ES1531, they need to take ES1103 before ES1531.

2 For BEng students in the following special programmes: DDPs, CDPs, GEP & CSP, internship / industrial-attachment is optional and the modular credits for the internship/industrial-attachment will be become 'Free Electives' i.e., Unrestricted Electives (UE).

To specialise in different areas, students need to choose elective modules from the outer core in Table 3.2.5b as well as a number of areas of concentrations in Table 3.2.5c as follows: Bioelectronic Systems, Communications & Networks, Integrated Circuits & Embedded Systems, Control, Intelligent Systems & Robotics, Signal Analysis and Machine Intelligence, Microelectronics Technologies & Devices, Microwave and RF, Power and Energy Systems, Engineering Science and Information Processing. The elective modules in each concentration are categorised as breadth or depth elective modules. A breadth elective module enables students to achieve a broad understanding of concepts in the particular concentration. A depth elective module is a higher level module that provides greater depth and coverage in the particular concentration.

During their senior years of study, students may specialize in certain fields of EE through their selection of 12 MCs of outer core elective modules in Table 3.2.5b and 16 MCs of technical electives from number of areas in Table 3.2.5c as follows: Communications & Networks, Integrated Circuits & Embedded Systems, Control, Intelligent Systems & Robotics, Signal Analysis & Machine Intelligence, Microelectronics Technologies & Devices, Microwave and RF, Power and Energy Systems, Bioelectronic Systems and Information Processing. An outer core elective module enables students to achieve a broad understanding of concepts in the particular area. A technical elective is a higher-level module that provides greater depth and coverage in the particular area.

The outer core modules are organised in eight areas in Table 3.2.5b. Students need to read three modules from a minimum of three areas of outer core modules to achieve exposure to various facets of EE. To achieve depth, students need to read a minimum of four technical electives. All three outer core must add up to at least 12 MCs and technical electives must add up to at least 16 MCs, out of which 8 MCs must be used to fulfil PPP and RFP Pathway requirements. The students opting for iDCP pathway must choose their unrestricted and technical electives as prescribed by the pathway requirements. EE students should read at least 12 MCs of technical elective modules offered by the EE Department (i.e., those with EExxxx module codes). Students may also take additional EE technical elective modules to satisfy the Unrestricted Elective Modules (UEM) and also further their interest in certain areas of engineering based on the recommended tracks. The list of tracks is given in Table 3.2.5d.
The outer core modules are organised in 8 areas of concentrations in Table 3.2.5b. Students need to read three modules from a minimum of three areas of concentrations of outer core modules to achieve exposure to various facets of ECE. To achieve depth, students need to read a minimum of two depth electives. EE students also need to read one elective which can be chosen from the breadth or depth elective of any concentration. All the technical electives must add up to at least 28 MCs. EE students should read at least 16 MCs of technical elective modules offered by the ECE Department (i.e., those with EExxxx module codes). By specific choice of electives, EE students will be able to specialise in a variety of areas. The list of specialisation set of modules is given in Table 3.2.5d.

Table 3.2.5b: List of Outer Core Modules in the Various Areas Concentrations

~~Outer Core~~	
Areas ~~of Concentration~~	~~Modules in the~~ Outer Core
Microwave & RF System	EE3104C Introduction to RF and Microwave Systems and Circuits
Communications & Networks	EE3131C Communication Systems

Control, Intelligent Systems & Robotics	EE3331C Feedback Control Systems
Integrated Circuit & Embedded Systems	EE3408C Integrated Analog Design
Microelectronics Technology & Devices	EE3431C Microelectronics Materials & Devices
Power & Energy Systems	EE3505C Electrical Energy Systems
Signal Analysis and Machine Intelligence	EE3731C Signal Processing Methods
Engineering Computing	~~CS1020E Data Structures and Algorithms I~~ CS2040/C Data Structures and Algorithms

Table 3.2.5c: List of Electives in the Various Areas Concentrations

Communications & Networks
EE3204 Computer Communication Networks I
EE4210 Computer Communication Networks II
EE5135 Digital Communications
Integrated Circuits & Embedded Systems
CG3207 Computer Architecture
EE3407 Analog Electronics
EE4218 Embedded Hardware System Design
EE4415 Integrated Digital Design
EE4434 Integrated Circuit Technology, Design and Testing

			EE5903 Real-Time Systems
			Control, Intelligent Systems & Robotics
			EE3302 Industrial Control Systems
			EE3304 Digital Control Systems
			EE4302 Advanced Control Systems
			EE4305 Introduction to Fuzzy/Neural Systems
			EE4307 Control Systems Design and Simulation
			EE4308 Advances in Intelligent Systems and Robotics
			ME4245 Robot Mechanics and Control
			EE5101R Linear Systems
			Microelectronic Technologies & Devices
			EE3409 Microelectronic Applications for Modern Life
			EE4435 Modern Transistors and Memory Devices
			EE4436 Fabrication Process Technology
			EE4437 Photonics – Principles and Applications
			EE4438 Solar Cells and Modules
			EE5440 Magnetic Data Storage for Big Data
			Power & Energy Systems

			EE4501 Power System Management & Protection
			EE4502 Electric Drives and Control
			EE4505 Power Semiconductor Devices and ICs
			EE4509 Silicon Microsystems
			EE4511 Sustainable Energy Systems
			EE5702 Advanced Power System Analysis
			EE5703 Modelling and Control of Electrical Actuators
			EE5711 Modelling and Control of Power Electronic Converters
			Signal Analysis and Machine Intelligence
			EE3206 Introduction to Computer Vision and ImageProcessing
			EE3701 Digital Media Technologies
			EE4212 Computer Vision
			EE5907 Pattern Recognition
			Microwave & RF
			EE4101 RF Communications
			EE4104 Microwave Circuits & Devices
			EE4112 HF Techniques
			EE5303 Microwave Electronics

Bioelectronic Systems
EE4603 Biomedical Imaging Systems
BN4404 BioMEMS
BN4406 Biophotonics and Bioimaging
Information Processing
CS2103 Software Engineering
CS2106 Introduction to Operating Systems
CS3230 Design and Analysis of Algorithms
CS3233 Competitive Programming
CS4231 Parallel and Distributed Algorithms

Table 3.2.5d: Possible Tracks in Electrical Engineering

Advanced Control
Biomedical Systems
Distributed Autonomous Systems
Embedded Systems
Computational Intelligence
Integrated Circuit Technology

			Information Storage Materials and Devices Mechatronics and Automation Microelectronic Devices Microwave and RF CAD Microwave and RF Systems Networking & Distributed Systems Power Systems Analysis and Control Power Electronics, Electric Drives & Semiconductor Devices Process Control Renewable Energy Materials & Devices Sustainable Energy Devices and Systems VLSI design Wireless Communications For details on module selections based on possible tracks, please refer to: https://www.ece.nus.edu.sg/home/education/Tracks.html

30.	7 Sep 2017	FoE	Degree Requirements
			Students in the BEng.(Mechanical Engineering) programme are required to satisfy the following requirements to graduate from the course:
			
			• Complete a minimum of 160 MCs with a CAP ≥ 2.0.
			• Pass the modules in accordance with Table 3.2.10a.
			• Pass at least 8 MCs equivalent of technical elective modules as listed in Table 3.2.10b. Students may, subject to approval of the Head of Department, take up to two ME5-Level technical modules in lieu of two of the technical electives
			• Subject to approval of the Head of Department, students may enrol in one of the following specialisations when they have completed a minimum of 100 MCs of the programme requirements:
			  ○ Aeronautical Engineering
			  ○ Energy and Sustainability
			  ○ Offshore Oil & Gas Technology
			• To qualify for a specialisation, a student must pass at least four modules from the chosen area of specialisation and any other requirements as given in Table 3.2.10c. Students in a specialisation programme are required to do their final-year dissertation (8MCs) in an area related to the specialisation. For updated information on Specialisation programmes, please refer to http://me.nus.edu.sg/current-students/specialisations/
			
			Students should not read more than 60 MCs of Level-1000 modules towards their degree requirements.
			Table 3.2.10a: Summary of ME Modular Requirements and Credits (For student intakes from AY2016/17 onwards)
			Students are advised to refer to Department of Mechanical Engineering website at me.nus.edu.sg for latest updated information on BEng (ME) Curriculum.
			MODULAR REQUIREMENTS | **MCs**
			University Requirements
			General Education Modules (GE) (5 Modules, each of 4MCs)
			
			• Human Cultures (GEH)
			• Quantitative Reasoning (GER) **20**
			• Thinking and Expression (GET)
			• Singapore Studies (GES)
			• Asking Questions (GEQ)

			Unrestricted Electives	**32**
			Programme Requirements	
			Faculty Requirements	**6**
			(ES1531 or equivalent) Critical Thinking & Writing[1]	4
			EG2401 Engineering Professionalism	2
			ES1xxx English[2]	–
			Foundation Requirements	**28**
			MA1505 Mathematics I	4
			MA1506 Mathematics II	4
			PC1431 Physics IE	4
			CS1010E Programming Methodology	4
			EG1111 Engineering Principles & Practice I	6
			EG1112 Engineering Principles & Practice II	6
			Mechanical Engineering Major Requirements	
			ME Core Subjects	**36**
			ME2112 Strength of Materials	4
			ME2121 Engineering Thermodynamics	4
			ME2134 Fluid Mechanics I	4
			ME2142 Feedback Control Systems	4
			ME2151 Principles of Mechanical Engineering Materials	4
			ME3112 Mechanics of Machines	4
			ME3162 Manufacturing Processes	4
			Professional Development (Students in iRP pathway will read 2 Level-5000 modules)	8
			ME Design and Project Modules	**20**
			ME2102 Engineering Innovation and Modelling	4
			ME3103 Mechanical Systems Design	8
			ME4101A BEng Dissertation (Over 2 semesters)	8
			EG3611 Industrial Attachment[3]	**10**

			ME Technical Electives (from Table 3.2.10b) 8 **Total 160** 1 BEng students are required to read ES1531 Critical Thinking & Writing. Alternatively, students can read ES1501X Academic Expository Writing. USP/UTRP/RVRC students should refer to their respective programmes for USP/UTRP/RVRC modules to be read in place of ES1531. 2 Students who have not passed or been exempted from the Qualifying English Test at the time of admission to the Faculty will have to read ES1000 and/or ES1103. This will be decided by CELC. 3 For BEng students who are from direct poly intake and in the following special programmes: DDPs, CDPs, GEP & CSP, industrial attachment is optional and the modular credits for the industrial attachment will become 'Free Electives' i.e., Unrestricted Electives (UE). Table 3.2.10b: ME Technical Electives Modules Applied Mechanics ME2114 Mechanics of Materials ME3211 Mechanics of Solids ME4212 Aircraft Structures ME4213 Vibration Theory and Applications ESP3206 Continuum Mechanics Control and Mechatronics ME2143 Sensors and Actuators ME3241 Microprocessor Applications ME3242 Automation ME4241 Aircraft Performance and Stability ME4245 Robot Mechanics and Control ME4246 Modern Control System ME5405◊ Machine Vision Fluid Mechanics ME2135 Fluid Mechanics II ME2143 Sensor and Actuators ME3232 Compressible Flow ME3233 Unsteady Flow in Fluid Systems ME4231 Aerodynamics and Propulsion ME4233 Computational Methods in Fluid Mechanics ME5304 ◊ Experimental Fluid Mechanics ME5305◊ Fundamentals of Aeroelasticity Manufacturing ME3261 Computer aided Design and Manufacturing ME3263 Design for Manufacturing and Assembly

			ME4261 Tool Engineering ME4262 Automation in Manufacturing ME4263 Fundamentals of Product Development Materials Science ME3251 Materials for Engineers ME4253 Biomaterials Engineering ME4255 Materials Failure ME4256 Functional Materials and Devices Micro Systems Technology ME3281 Microsystems Design and Applications Thermodynamics ME3122 Heat Transfer ME3221 Sustainable Energy Conversion ESP3401 Photovoltaic Devices & Systems ME4223 Thermal Environmental Engineering ME4225 Applied Heat Transfer ME4226 Energy and Thermal Systems ME4227 Internal Combustion Engine ESP4401 Optimization of Energy Systems Multidisciplinary ME3291 Numerical Methods in Engineering ME4291 Finite Elements Analysis Table 3.2.10c: Technical Electives Modules for ME Specialisations Students are advised to refer to Department of Mechanical Engineering website at http://me.nus.edu.sg/current-students/specialisations/ for latest updated information related to specialisations. Aeronautical Engineering Students taking the Aeronautical Engineering Specialisation must read ME2135 Fluid Mechanics II, select TWO modules from Group A and TWO modules from Group B and present their FYP in a poster session. Compulsory ME2135 Fluid Mechanics II Group A ME3232 Compressible Flow ME4231 Aerodynamics and Propulsion ME4241 Aircraft Performance and Stability ME5305◊ Fundamentals of Aeroelasticity Group B ME4212 Aircraft Structures

			ME4233 Computational Methods in Fluids Mechanics ME4291 Finite Element Analysis ME5304◊ Experimental Fluid Mechanics Energy and Sustainability Students taking the Energy and Sustainability specialisation must take at least FOUR modules from the list below and present their FYP in a poster session ME3221 Sustainable Energy Conversion ME4223 Thermal Environmental Engineering ME4225 Applied Heat Transfer ME4226 Energy and Thermal Systems ME4227 Internal Combustion Engines ME5205◊ Energy Engineering ME5207◊ Solar Energy Systems ME5516◊ Emerging Energy Conversion and Storage Technologies ESP3401 Photovoltaic Devices & Systems ESP4401 Optimization of Energy Systems ESP4402 Transport Phenomena in Energy Systems Offshore Oil and Gas Technology Students taking the Offshore Oil and Gas Technology specialisation must take Group A modules and at least another TWO modules from Group B. Group A GE3244 Fundamentals in Petroleum Geoscience (Fulfil UEM requirements) ME2135 Fluid Mechanics II ME4105 Specialisation Study Module (Offshore Oil and Gas Technology) Group B ME3211 Mechanics of Solids ME3233 Unsteady Flow in Fluid Systems ME4213 Vibration Theory and Applications ME4245 Robot Mechanics and Control ME4261 Tool Engineering ME5506◊ Corrosion of Materials ◊ Stage 4 status and a CAP of more than 3.5 are needed in order to read Level-5000 modules.

31.	20 Sep 2017	FoE	NUS Bulletin AY2017/18 / Faculty of Engineering Key Contact Information Academic Advisors for Undergraduate Programmes

Title & Name	Designation/Responsibility	Telephone	Email (xxxx@nus.edu.sg)
C. Department of Civil & Environmental Engineering			
Dr CHIAN Siau Chen Darren	Level-1000 Advisor	6516 4729	ceecsc
Dr LOW Ying Min	Level-2000 Advisor	6516 4127	ceelowym
Assoc Prof QIAN Xudong	Level-3000 Advisor	6516 6827	ceeqx
Assoc Prof MENG Qiang	Level-4000 Advisor	6516 5494	ceemq
Assoc Prof HU Jiangyong	Environmental Programme Director	6516 4540	ceehujy
Dr KELLY Barry	Year 1 Advisor	6516 3764	ceekbc
Assoc Prof CHEN Jia-Ping, Paul	Year 2 Advisor	6516 8092	ceecjp
Assoc Prof BAI Renbi	Year 3 Advisor	6516 4532	ceebair
Assoc Prof YU Liya	Year 4 Advisor	6516 6474	ceeley

Note:

Assoc Prof GOH Siang Huat	Level-1000 Advisor (CVE)	6516 8663	ceegsh
Dr Kuang Sze Chiang, Kevin	Level-2000 Advisor (CVE)	6516 4683	ceeksck
Dr CHIAN Siau Chen Darren	Level-3000 Advisor (CVE)	6516 4729	ceecsc
Assoc Prof QIAN Xudong	Level-4000 Advisor (CVE)	6516 6827	ceeqx
Dr Bae Sung Woo	Level-1000 Advisor (EVE)	6516 2884	ceebsw
Assoc Prof CHEN Jia-Ping, Paul	Level-2000 Advisor (EVE)	6516 8092	ceecjp
Assoc Prof BAI Renbi	Level-3000 Advisor (EVE)	6516 4532	ceebair
Assoc Prof YU Liya	Level-4000 Advisor (EVE)	6516 6474	ceeley

3.2.3 Bachelor of Engineering (Civil Engineering)

3.2.3.2 Degree Requirements

In order to graduate with the BEng (Civil Engineering) degree, students are required to:

- Complete a minimum of 162 MCs with a CAP ≥2.0.
- Pass the modules in accordance with Table 3.2.3a.
- Satisfy all other requirements as prescribed by the Faculty or the University.
- Students are required to read ES2331 Communicating Engineering towards the ULR requirement.

Note:

- Complete a minimum of 160 MCs with a CAP ≥2.0.

Students may apply to specialise in Offshore Engineering at start of Stage 3. They must take a Group Design Project and a BEng Dissertation that is related to offshore engineering, OT5202 Analysis & Design of Offshore Structures and CE5307 Wave Hydrodynamics and Physical Oceanography, and complete at least a 12-week stint (equivalent to at least 6 MCs) in an offshore or marine-related company under the 6-month industrial attachment (or EG3612 Vacation Internship Programme).
Note:

… complete an Industrial Attachment (EG3611A) for A-level or equivalent students, or a Vacation Internship Programme (EG3612) for Poly direct-entry students in an offshore or marine-related company.

Table 3.2.3a: Summary of Modular Requirements and Credits (for A-level or equivalent students matriculated in AY2015/2016)

Modular Requirements	MCs
University Level Requirements	20
General Education Modules (GE) (5 Modules, each of 4MCs) • Human and Cultures (H&C) • Quantitative Reasoning (QR) • Thinking and Expression (T&E) • Singapore Studies (SS) • Asking Questions (AQ)	20
Unrestricted Electives	20
Programme Requirements	

Faculty Requirements:	10
ES1531 Critical Thinking & Writing[1]	–
ES2331 Communicating Engineering (UE)	4
EG2401 Engineering Professionalism	3
ES1102 English[2]	–
HR2002 Human Capital in Organizations	3
Foundation Requirements:	16
MA1505 Mathematics I	4
MA1506 Mathematics II	4
CE1109 Statics and Mechanics of Materials	4
PC1431 Physics IE	4
CE Computing Requirement:	4
CE2409 Computer Applications in Civil Engineering	4
Civil Engineering Major Requirements	
CE Core Subjects:[+]	56
CE2112 Soil Mechanics (G)	4
CE2134 Hydraulics (H)	4
CE2155 Structural Mechanics and Materials (S)	4
CE2183 Construction Project Management (C)	4
CE2184 Infrastructure and the Environment (C)	4
CE2407 Engineering and Uncertainty Analyses	4
ESE3001 Water Quality Engineering (E)	4
CE3115 Geotechnical Engineering (G)	4
CE3116 Foundation Engineering (G)	4
CE3121 Transportation Engineering (T)	4
CE3132 Water Resources Engineering (H)	4
CE3155 Structural Analysis (S)	4
CE3165 Structural Concrete Design (S)	4
CE3166 Structural Steel Design and System (S)	4

CE Design and Project Modules:		12
CE4103	Design Project	4
CE4104	BEng Dissertation	8
CE Electives:		12
Level 3 Technical Elective Modules		4
Higher Level Technical Elective Modules		8
Industrial Engagement[3]		12
Total		162

Note:

Please refer to Table A in this URL for updates:
http://www.eng.nus.edu.sg/cee/programmes/BEng_ce/DegreeRequirements&RecommendedSchedules_CVE.pdf
(page 2 to 3)

Table 3.2.3b: Technical Elective Modules
Geotechnical Engineering Modules (G)
CE4216 Geotech. Investigation & Applied Geology
CE5101 Seepage and Consolidation of Soils
CE5104 Underground Space
CE5105 Anal. & Num. Meth. in Foundation Eng.rg
CE5106 Ground Improvement
CE5107 Pile Foundations
CE5108 Earth Retaining Structures
CE5881 Topics in Geotechnical Engineering †
Environmental Engineering Modules (E)
ESE3101 Solid and Hazardous Waste Management
ESE4401 Water & Wastewater Engineering 2
ESE4405 Urban Water Engineering & Management
ESE5205 Sludge & Solid Waste Management
ESE5402 Industrial Water Control
Structural Engineering Modules (S)
CE4257 Linear Finite Element Analysis
CE4258 Structural Stability and Dynamics
CE5509 Advanced Structural Steel Design
CE5510 Advanced Structural Concrete Design

			CE5514 Plate and Shell Structures CE5513 Plastic Analysis of Structures CE5604 Advanced Concrete Technology CE5610 Assessment and Retrofit of Concrete Structures CE5611 Precast Concrete Technology CE5885 Topics in Structural Engineering † CE5886 Topics in Concrete Engineering † Infrastructure Systems Modules (C and T) CE4221 Design of Land Transport Infrastructure CE4282 Building Information Modelling for Project Management CE5204 Pavement Design and Rehabilitation CE5205 Transportation Planning CE5207 Pavement Network Management Systems CE5603 Engineering Economics and Project Evaluation CE5804 Global Infrastructure Project Management CE5805 Construction Equipment and Methods CE5806 Construction Project and Site Control CE5880 Topics in Project Management Engineering† CE5882 Topics in Transportation Engineering † TP5025 Intelligent Transportation Systems TP5026 Transport Management & Policy TP5027 Transport & Freight Terminal Management TP5028 Intermodal Transportation Operations Coastal & Offshore Engineering Modules (H) CE4231 Earth's Climate: Science & Modelling CE4247 Treatment Plant Hydraulic CE5307 Wave Hydrodynamics and Physical Oceanography CE5308 Coastal Processes & Sediment Transport CE5312 River Mechanics CE5313 Groundwater Hydrology CE5883 Topics in Hydraulic & Water Resources OT5101 Exploration and Production of Petroleum OT5201 Marine Statics and Dynamics OT5202 Analysis & Design of Offshore Structures OT5203 Design of Floating Structures OT5204 Moorings & Risers OT5205 Offshore Pipelines

OT5206 Offshore Foundations
OT5207 Arctic Engineering
OT5208 Fatigue and Fracture for Offshore Structures
OT5881 Topics in Offshore Engineering †
OT5882 Topics in Subsea Engineering †
Other Technical Modules
CE3101 Integrated Infrastructure Project†
CE3102 Engineering of Socio-Technical Systems
GE2215 Introduction to GIS
GE3238 GIS Design and Practice
CE4291 Special Topics in Civil Engineering†
CE5701 Special Topics in Civil Engineering†
CE5702 CE Reliability Analysis and Design†

† depending on the topics covered
Note:

Please refer to Table A (i) in this URL for updates:
http://www.eng.nus.edu.sg/cee/programmes/BEng_ce/DegreeRequirements&RecommendedSchedules_CVE.pdf
(page 3 to 4)

3.2.3.3 Recommended Semester Schedule
Table 3.2.3b: Recommended Semester Schedule for CE Students (AY2015/2016 onwards)

Modules	MCs	Modules	MCs
Semester 1		Semester 2	
MA1505 Mathematics I	4	MA1506 Mathematics II	4
PC1431 Physics IE	4	CE2134 Hydraulics	4
CE1109 Statics and Mechanics of Material	4	CE2155 Structural Mechanics and Materials	4
CE2409 Computer Applications in Civil Engineering^	4	GE on QR or T&E	4
GE on QR or T&E	4	GE	4
ES1102 English for Academic Purposes *	–		
Sub-total	20	Sub-total	20

* For students who have not passed or been exempted from the Qualifying English Test at the time of admissions to the Faculty, they have to do ES1000 and / or ES1102. This will be decided by CELC. ES1531 must be read and it can be used to fulfil GEM A.
^ CA – 100%

Modules	MCs	Modules	MCs
Semester 3		Semester 4	
CE2112 Soil Mechanics	4	CE3115 Geotechnical Engineering	4
CE2183 Construction Project Management	4	CE3132 Water Resources Engineering	4
CE2184 Infrastructure and the Environment	4	CE3155 Structural Analysis	4
CE2407 Engineering and Uncertainty Analyses	4	ESE3001 Water Quality Engineering	4
ES2331 Communicating Engineering	4	GE on H&C	4
Sub-total	20	Sub-total	20

Modules	MCs	Modules	MCs
Semester 5		Semester 6	
CE3116 Foundation Engineering	4	Industrial Engagement	12
CE3121 Transportation Engineering	4	UE 1	4
CE3165 Structural Concrete Design	4	UE 2	4
CE3166 Structural Steel Design and System	4		
Technical Elective Module 1	4		
GE on AQ	4		
Sub-total	24	Sub-total	20

Modules	MCs	Modules	MCs
Semester 7		Semester 8	
CE4103 Design Project¨	4	CE4104 BEng Dissertation (Cont'd)	4
CE4104 BEng Dissertation	4	UE 4	4
Technical Elective Module 2	4	UE 5	4
Technical Elective Module 3	4	HR2002 Human Capital in Organizations	3
UE 3	4	EG2401 Engineering Professionalism	3
Sub-total	20	Sub-total	18

¨ CE4103 is offered in semester 7 or 8, but take note that allocations for semester 8 are limited and also depending on your specialisation (if any).

Table 3.2.3d: Recommended Semester Schedule for CE students with an accredited Polytechnic Diploma matriculated August 2014

Modules	MCs	Modules	MCs
Semester 3		Semester 4	
MA1301 Introductory Mathematics *(fulfils Free Elective 1)*	4	MA1505 Mathematics I	4
CE2155 Structural Mechanics and Materials	4	CE2112 Soil Mechanics	4
CE2184 Infrastructure and the Environment	4	CE2134 Hydraulics	4
PC1431 Physics IE *(upon failure of APC test)*	4	ESE3001 Water Quality Engineering	4
GE on QR or T&E	4	GE on QR or T&E	4
ES1102 English for Academic Purposes	–		
Sub-total	20	Sub-total	20

Note:

- @ PC1431 is a compulsory module and can be read in any semester if you choose to. Or you can also take PC1221 Fundamental of Physics 1 before taking PC1431.
- ES1531 must be read and it can be used to fulfil GE (T&E).

Modules	MCS	Modules	MCs
Semester 5		Semester 6	
MA1506 Mathematics II	4	CE3116 Foundation Engineering	4
CE2183 Construction Project Management	4	CE3165 Structural Concrete Design	4
CE3115 Geotechnical Engineering	4	CE3166 Structural Steel and Design System	4
CE3155 Structural Analysis	4	CE3132 Water Resources Engineering	4
GE on SS	4	Technical Elective Module 1	4
		GE on HC	4
Sub-total	24	Sub-total	24

Modules	MCS	Modules	MCs
Semester 7		Semester 8	
CE2407 Engineering and Uncertainty Analysis	4	CE4104 BEng Dissertation (Cont'd)	4
CE4103 Design Project¨	4	Technical Elective Module 3	4
CE4104 BEng Dissertation	4	Technical Elective Module 4	4
CE3121 Transportation Engineering	4	EG2401 Engineering Professionalism	3
Free Elective x 2	8	GE on AQ	4
Sub-total	20	Sub-total	19

¨ CE4103 is offered in semester 7 or 8, but take note that allocations for semester 8 are limited and also depending on your specialisation (if any).

Note:
Polytechnic graduates admitted into BEng programmes with the (12MC) Industrial Engagement requirement, may take the 12-week internship (6MC via EG3612) and/or 'Free Elective' modules in lieu of the 12 MC for EG3611. Students can consider taking their Free Elective module/s during Special Terms.

Note:

Please refer to page 5 in this URL for updates:
http://www.eng.nus.edu.sg/cee/programmes/BEng_ce/DegreeRequirements&RecommendedSchedules_CVE.pdf

3.2.7 Bachelor of Engineering (Environmental Engineering)

3.2.7.2 Degree Requirements

The following are the requirements for the degree of BEng (Environmental Engineering):

- Students in the BEng (Environmental Engineering) Programme are required to complete a minimum of 162 MCs with a CAP ≥ 2.0 to graduate from the programme.
- 162 MCs will have to be earned by reading modules in accordance with Table 3.2.7a.
- The students are free to choose any combination of the offered modules from Table 3.2.7b to complete 12 MCs of the technical electives.
- A student must also satisfy other additional requirements that may be prescribed by the Faculty of Engineering or the University.

Students may apply to read Minor in Civil Infrastructure and upon successfully completion of the requirement, student would be sufficiently proficient in core Civil Engineering disciplines. These will provide necessary background and training to better prepare the graduates for a professional role in infrastructure development. For details, please refer to section 3.3.5.

Table 3.2.7a: Summary of Modular Requirements and Credits (for A-level or equivalent students matriculated in AY2015/2016)

Modular Requirements	MCs
University Level Requirements	20
General Education Modules (GE) (5 Modules, each of 4MCs) • Human and Cultures (H&C) • Quantitative Reasoning (QR) • Thinking and Expression (T&E) • Singapore Studies (SS) • Asking Questions (AQ)	20
Unrestricted Electives	20

Programme Requirements	
Faculty Requirements	10
ES1531 Critical Thinking & Writing[1]	–
ES2331 Communicating Engineering	4
HR2002 Human Capital in Organizations	3
EG2401 Engineering Professionalism	3
ES1102 English[2]	–
Environmental Engineering Major Requirements	
Foundation Requirements	20
MA1505 Mathematics I	4
MA1506 Mathematics II	4
PC1431 Physics IE	4
CE2409 Computer Applications in Civil Engineering	4
CM1502 General and Physical Chemistry for Engineers	4
Basic Engineering Modules:	16
CE1109/CE1109FC/CE1109X Statics and Mechanics of Materials	4
CE2134 Hydraulics	4
CE2183 Construction Project Management	4
CE2407 Engineering and Uncertainty Analysis	4
Engineering Process/Infrastructure Engineering (3 of the following courses):	12
CE2112 Soil Mechanics	4
CE2155 Structural Mechanics and Materials	4
CE3132 Water Resources Engineering	4
CM2142 Analytical Chemistry	4
CN2121 Chemical Engineering Thermodynamics	4
AR2723 Strategies for Sustainable Architecture	4
LSM1401 Fundamentals of Biochemistry	4
Environmental Engineering Core Modules:	28
ESE1001 Environmental Engineering Fundamentals	4
ESE2001 Environmental Processes	4

ESE2401 Water Science & Technology	4
ESE3101 Solid and Hazardous Waste Management	4
ESE3201 Air Quality Management	4
ESE3301 Environmental Microbiological Principles	4
ESE3401 Water & Wastewater Engineering 1	4
ESE Design and Project Modules	12
ESE4501 Design Project	4
ESE4502R BEng Dissertation	8
ESE Elective Modules	12
3 Technical Electives (from Table 3.2.7b)	
Industrial Engagement[3]	12
Total	162

1 BEng students are required to read a Critical Thinking & Writing module (ES1531 Critical Thinking & Writing which also satisfies the General Education (Thinking & Expression) requirement) and a Communications module (ES2331 Communicating Engineering). Alternatively, students can read ES1501X Academic Expository Writing in place of both ES1531 and ES2331. USP/UTRP/RVRC students should refer to their respective programmes for USP/UTRP/RVRC modules to be read in place of ES1531 and/or ES2331.
2 For students who have not passed or been exempted from the Qualifying English Test at the time of admissions to the Faculty.
3 For BEng students in the following special programmes: DDPs, CDPs, GEP & CSP, internship / industrial-attachment is optional and the modular credits for the internship/industrial-attachment will be become 'Free Electives' i.e., Unrestricted Electives (UE).
Note: Limit on Level-1000 Modules
Students should not read more than 60 MCs of Level-1000 modules towards their degree requirements (minimum of 162 MCs for graduation).
Table 3.2.7b: Technical Elective Modules*
Department of Civil and Environmental Engineering
ESE4301 Wastewater Biotechnology
ESE4401 Water & Wastewater Engineering 2
ESE4403 Membrane Tech in Env Applns
ESE4404 Bioenergy
ESE4405 Urban Water Engineering & Management
ESE4406 Energy and the Environment

			ESE4407 Environmental Forensics ESE4408 Environmental Impact Assessment ESE4409 Environmental Applications of Adsorption ESE5201 Combustion Pollution Control ESE5202 Air Pollution Control Technology ESE5203 Aerosol Science and Technology ESE5204 Toxic & Hazardous Waste Management ESE5205 Sludge and Solid Waste Management ESE5301 Environmental Biological Principles ESE5401 Water Quality Management ESE5402 Industrial Wastewater Control ESE5403 Water Reclamation & Reuse ESE5404 Biological Treatment Processes ESE5405 Water Treatment Processes ESE5406 Membrane Treatment Process and Modelling ESE5601 Environmental Risk Assessment ESE5602 Environmental Management Systems ESE5603 Pollution Minimisation and Prevention CE4231 Earth's Climate: Science & Modelling CE4247 Treatment Plant Hydraulics CE5307 Wave Hydrodynamics and Physical Oceanography CE5603 Engineering Economics & Project Evaluation CE5883A Topics in Hydraulic & Water Resources * CEE reserves the right to decide on the modules to be offered in any given semester. Dept of Chemical and Biomolecular Engineering SH5002 Fundamentals in Industrial Safety SH5110 Chemical Hazard Evaluation SH5101 Industrial Toxicology SH5402 Advanced SHE Management Dept of School of Design and Environment LX5103 Environmental Law Note:

Please refer to page 1 to 4 in this URL for updates:
http://cee.nus.edu.sg/programmes/BEng_eve/DegreeRequirements&RecommendedSchedules_EVE.pdf

3.2.7.3 Recommended Semester Schedule

The recommended semester schedule for EVE students is presented in Table 3.2.7b and Poly-Direct entry in Table 3.2.7c.

Table 3.2.7b: Recommended Semester schedule for EVE Students (Cohort AY2015/2016 onwards)

Modules	MCs	Modules	MCs
Semester 1		Semester 2	
MA1505 Mathematics I	4	MA1506 Mathematics II	4
PC1431 Physics IE	4	GE on QR or T&E	4
ESE1001 Environmental Engineering Fundamentals	4	CE2134 Hydraulics	4
GE on QR or T&E	4	CM1502 General and Physical Chemistry for Engineers	4
CE1109 Statics and Mechanics of Materials	4	CE2122 Soil Mechanics LSM1401 Fundamentals of Biochemistry $^{\Delta}$	4
ES1102* English for Academic Purposes	–		
Sub-total	20	Sub-total	20

* Students who have not passed or even been exempted from the Qualifying English Test at the time of admissions to the Faculty, will have to read ES1000 and/or ES1102. This will be decided by CELC. ES1531 must be read and it can be used to fulfil GE (T&E).

Modules	MCs	Modules	MCs
Semester 3		Semester 4	
CE2155 Structural Mechanics and Materials$^{\Delta}$ or CN2121 Chemical Engineering Thermodynamics $^{\Delta}$,or LSM1401 Fundamentals of Biochemistry $^{\Delta}$,or CM2142 Analytical Chemistry $^{\Delta}$	4	LSM1401 Fundamentals of Biochemistry $^{\Delta}$,or CM2142 Analytical Chemistry $^{\Delta}$,or AR2723 Strategies for Sustainable Architecture $^{\Delta}$,or CE3132 Water Resources Engineering $^{\Delta}$	4
CE2409 Computer Applications in Civil Engineering	4	ESE2401 Water Science & Technology	4
CE2407 Engineering and Uncertainty Analysis	4	2 x GE	8
ESE2001 Environmental Processes	4	UE 1	4

ES2331 Communicating Engineering	4	UE 2	4
Sub-total	20	Sub-total	24

∆ Students are required to read 3 out of the 6 modules listed. LSM1401 and CM2142 are offered in both Semesters. Module choices are subjected to timetable availability and fulfilment of co/pre-requisites, if any.

Modules	MCs	Modules	MCs
Semester 5		Semester 6	
ESE3101 Solid and Hazardous Waste Mgmt	4	Industrial Engagement	12
ESE3201 Air Quality Management	4	UE 3	4
ESE3301 Environmental Microbiological Principles	4	UE 4	4
ESE3401 Water & Wastewater Engineering 1	4		
CE2183 Construction Project Management	4		
Sub-total	20	Sub-total	20

Modules	MCs	Modules	MCs
Semester 7		Semester 8	
ESE4501 Design Project	4	ESE4502R BEng Dissertation (Cont'd)	4
ESE4502R BEng Dissertation	4	HR2002 Human Capital in Organizations	3
Technical Elective Module 2	4	EG2401 Engineering Professionalism	3
Technical Elective Module 3	4	UE 5	4
GE	4	Technical Elective Module 1	4
Sub-total	20	Sub-total	18

Note: The above schedule can be revised in the event of timetabling constraints.

Note:

Please refer to page 5 in this URL for updates:
http://cee.nus.edu.sg/programmes/BEng_eve/DegreeRequirements&RecommendedSchedules_EVE.pdf

Table 3.2.7c: Recommended Semester Schedule for BEng (Env Eng) students with an accredited Polytechnic Diploma matriculated August 2014

Modules	MCs	Modules	MCs
Semester 3		Semester 4	
MA1301 Introductory Mathematics *(can count towards Free Elective 1)*	4	MA1505 Mathematics I	4
GE on QR or T&E	4	ESE2401 Water Science and Technology	4
ESE1001Environmental Engineering Fundamentals	4	CM1502 General and Physical Chemistry for Engineers*	4
ESE2001 Environmental Processes	4	GE on QR or T&E	4
PC1431 Physics IE *	4	CE1109 Statics and Mechanics	4
ES1102** English for Academic Purposes	–	GE	4
Sub-total	20	Sub-total	24

* PC1431 or CM1502 will be exempted for those who have passed the APC Test for either one of the modules.

** Students who have not passed or even been exempted from the Qualifying English Test at the time of admissions to the Faculty, will have to read ES1000 and/or ES1102. This will be decided by CELC.

Note:

- Student exempted from MA1301, will take MA1505 in Semester 1 then MA1506 in Semester 2 and CE2407 in Semester 3.
- ES2331 must be read on a graded basis to fulfil UEM

Modules	MCs	Modules	MCs
Semester 5		Semester 6	
MA1506 Mathematics II	4	CE2155* Structural Mechanics and Materials (Pre-Req: CE1109), or CM2142* Analytical Chemistry (Pre-Req: CM1101), or AR2723* Strategies for Sustainable Architecture, or LSM1401* Fundamentals of Biochemistry	4
CE2112* Soil Mechanics (Pre-Req: CE1109), or	4	CE2134 Hydraulics	4

LSM1401* Fundaments of Biochemistry, or CN2121* Chemical Engineering Thermodynamics (Pre-Req: CN1111 and CM1502), or CM2142* Analytical Chemistry (Pre-Req: CM1101 waived if pass CM1502)			
ESE3401 Water and Wastewater Engineering 1	4	Technical Elective Module 1	4
CE2183 Construction Project Management	4	Free Elective Module 2	4
GE	4	Free Elective Module 3	4
GE	4		
Sub-total	24	Sub-total	20

* Students are required to read 3 out of 6 modules listed. LSM 1401 and CM 2142 are offered in both semesters. Module choices are subjected to timetable availability and fulfilment of co/pre-requisites, if any.

Modules	MCs	Modules	MCs
Semester 7		Semester 8	
ESE3101 Solid & Hazardous Waste Management	4	ESE4502 BEng Dissertation *(cont'd)*	4
ESE3201 Air Quality Management	4	CE2155* Structural Mechanics and Materials (Pre-Req: CE1109), or CE3132 Water Resources Engineering (Pre-Req: CE2134), or AR2723* Strategies for Sustainable Architecture, or CM2142* Analytical Chemistry (Pre-Req: CM1101), or LSM1401* Fundamentals of Biochemistry	4
ESE3301 Environmental Microbiological Principles	4	EG2401 Engineering Professionalism	3
ESE4501 Design Project	4	Technical Elective Module 2	4
ESE4502 BEng Dissertation	4	Technical Elective Module 3	4

CE2407 Engineering and Uncertainty Analysis *(if not taken in earlier semesters)*	4		
Sub-total	24	Sub-total	19

Note:

- The above schedule can be revised in the event of timetabling constraints.
- Polytechnic graduates admitted into BEng programmes with the (12MC) Industrial Engagement requirement, may take the 3-month internship (6MC via EG3612) and/or 'Free Elective' modules in lieu of the 12 MC for EG3611. Students can consider taking their Free Elective module/s during Special Terms.

Note:

Please refer to page 8 & 9 in this URL for updates:
http://cee.nus.edu.sg/programmes/BEng_eve/DegreeRequirements&RecommendedSchedules_EVE.pdf

32.	13 Oct 2017	FoE	NUS Bulletin 2017/18 – Double Major Programmes, Faculty of Engineering http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/special-programmes/double-major-programmes/ ~~3.5.5.1 Second Major in Management (Technology) Programme~~ 3.5.5.1 ~~2~~ Second Major in Systems Engineering Programme

33.	28 Feb 2018	FoE	At http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/special-programmes/double-major-programmes/second-major-in-systems-engineering-programme/ Please see changes in red: The Department of Industrial Systems Engineering & Management (ISEM) offers the Major in Systems Engineering (Sys Eng Major), a Second Major as part of NUS Special Undergraduate Programmes, for students from all other faculties and schools. The programme is offered from August 2008. Students may be admitted to the programme based on the following criteria: • Students can apply on admission or after they Must have completed their first year of study; • Must apply no later than the 5th semester of their study; • Must have a CAP score of at least 3.5 Applications should be submitted to the ISEM Department. Selection for Admission will be on a competitive basis and subjected to the approval from ISEM Department as well as availability of quota. Students opting for the Second Major in Systems Engineering should have a suitable mathematics and statistics background. They should read the following modules: 1. MA1505 Mathematics I or equivalent; 2. MA1506 Mathematics II or equivalent; and 3. ST1131 Introduction to Statistics or its equivalent. To fulfil the requirements of the Second Major in Systems Engineering, students are required to complete 48 MCs (12 modules). Students may use up to a maximum of 8 16 MCs of their Second Major in Systems Engineering modules to double count towards other programmes. In line with the NUS Centralised Online Registration System (CORS), students admitted into the Second Major in Systems Engineering programme will have to bid for their modules during CORS registration. Once admitted to the Second Major in Systems Engineering programme, students do not need to maintain any minimum academic performance threshold in order to remain in the programme. They are strongly encouraged to plan their modules well in order to be able to complete the programme requirements. Students who complete the 24 MCs of core modules* listed in section (A) will be awarded a Minor in Systems Engineering if they do not wish to complete all the requirements for the Second Major in Systems Engineering.

Module Requirements for 2nd Major in SE AY2017/2018 Intake Onwards

Modules	MCs
Seven Core Modules	**32**
ST2334 Probability and Statistics*	4
IE1113 Introduction to Systems Analytics*	4
IE1114 Introduction to Systems Thinking and Dynamics*	4
IE2110 Operations Research I*	4
IE2150 Human Factors Engineering*	4
IE3105 Fundamentals in Systems Engineering & Architecture*	4
IE3102 System Engineering Project	8
Two Electives Modules	**8**
Any two modules from the following:	
CS2113T Software Engineering	4
IE2130 Quality Engineering I	4
IE3101 Statistics for Engineering Applications	4
IE3110R Simulation	4
IE4240 Project Management (or equivalent)	4
IE4243 Decision Modeling & Risk Analysis	4
	4
Two Systems Modules	**8**
Any two modules from the following:	
Industrial Systems	
IE3120 Manufacturing Logistics	4
IE4220 Supply Chain Modeling	4
IE4221 Transport Demand Modeling & Economics	4
IE4244 Energy: Security, Competitiveness & Sustainability	4
Infrastructure Systems	
CE3101 Integrated Infrastructure Project	4

			CE3102 Engineering of Socio-technical systems	4
			CE3121 Transportation Engineering	4
			CE3132 Water Resources Engineering	4
			CE4221 Design of Land Transport Infrastructures	4
			CE4282 Building Information Modeling for Project	4
			ESE3101 Solid and Hazardous Waste Management	4
			Computer Systems	
			CS2102 Database Systems	4
			CS4244 Knowledge Based Systems	4
			CS4246 AI Planning & Decision Making	4
			Electrical/ Electronic Systems	
			EE3331C Feedback Control Systems	4
			EE3505C Electrical Energy Systems	4
			EE4214 Real Time Embedded Systems	4
			EE4305 Introduction to Fuzzy/ Neural Systems	4
			EE4307 Control Systems Design & Simulation	4
			EE4308 Advances in Intelligent Systems & Robotics	4
			EE4501 Power Systems Management & Protection	4
			EE4511 Sustainable Energy Systems	4
			Mechanical Systems	
			ME4246 Modern Control Systems	4
			ME4263 Fundamentals of Product Development	4
			ME4266 Energy & Thermal Systems	4
			Chemical Systems	
			CN4122 Process Synthesis & Simulation	4
			CN4201R Petroleum Refining	4
			CN4238 Chemical & Biochemical Process Modelling	4
			CN4245R Data Based Process Characterization	4
			Biomedical Systems	
			BN3101 Biomedical Engineering Design	4
			BN4203 Rehabitation Engineering	4

			Total	**48**

A. Completion of the following six compulsory modules:

- ST2131 Probability
- IE2100 Probability Models with Applications
- IE2101 Introduction to Systems Thinking
- IE2110 Operations Research I
- IE2140 Engineering Economy
- IE3101 Statistics for Engineering Applications

B. Completion of at least two modules from the following:

- IE3110 Simulation
- IE4210 Operations Research II
- IE4240 Project Management
- IE5203 Decision Analysis
- IE5404 Large Scale Systems Engineering

C. Completion of at most four modules from the following:

Service Systems

- IE5213 Service Innovation and Management
  *ISE BEng 4 standing or higher

			• IE5214 Infocomm Systems Project Management * ISE BEng 4 standing or higher Transportation and Infrastructure Systems • CE5804 Global Infrastructure Project Management • TP5025 Intelligent Transportation Systems *CE4 standing or higher • TP5026 Transport Management & Policy *CE4 standing or higher • TP5027 Transport & Freight Terminal Management *CE4 standing or higher • TP5028 Intermodal Transportation Operations *CE4 standing or higher Chemical Process Systems • CN4205R Process Systems Engineering *CN3121, CN4111 • CN4227R Advanced Process Control *CN3121 • CN4245R Data Based Process Characterisation *CN3121 or equivalent • CN5111 Optimization of Chemical Processes *Linear algebra and numerical methods at the undergraduate level • CN5181 Computer-Aided Chemical Engineering

			• CN5185 Batch Process Engineering Control Systems • EE4305 Introduction to Fuzzy/Neural Systems *EE2010 for EE & CPE students • ME4246 Linear Systems *ME2142 Systems Based Projects • BN3101 Biomedical Engineering Design • EE3001 Project *Level 3 standing * Pre-requisite(s) For the purpose of the Second Major in Systems Engineering, students will use their standing in their home programmes as fulfilment of the pre-requisites for modules that require ISE BEng 4 standing or higher provided that they have completed the 24 MCs of compulsory modules (section A). For queries on the Second Major in Systems Engineering, please email us at isebox1@nus.edu.sg.

<table>
<tr>
<td>34.</td>
<td>19 Apr 2018</td>
<td>FoE</td>
<td>URL: http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-materials-science-and-engineering/degree-requirements/
Section: 3.2.9.2 Degree Requirements
Table 3.2.9a: Summary of MSE Module Requirements and Credits for Research-focused Pathway
<table>
<tr><th>Modular Requirements</th><th>MCs</th></tr>
<tr><td>UNIVERSITY LEVEL REQUIREMENTS</td><td>20</td></tr>
<tr><td>General Education Modules (GE) (5 Modules, each of 4 MCs)
Human Cultures (HC)
Quantitative Reasoning (QR)
Thinking and Expression (T&E)
Singapore Studies (SS)
Asking Questions (AQ)</td><td>20</td></tr>
<tr><td>UNRESTRICTED ELECTIVES</td><td>30</td></tr>
<tr><td>Faculty Requirements:</td><td>6</td></tr>
<tr><td>EG2401A Engineering Professionalism</td><td>2</td></tr>
<tr><td>ES1531 Critical Thinking & Writing</td><td>4</td></tr>
</table>
</td>
</tr>
</table>

English [1]	–
1st Year Requirements:	24
MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2
PC1432 Physics IIE [2]	4
CM1501 Organic Chemistry for Engineers or CM1121 Organic Chemistry 1 [3]	4
MLE1001 Materials Science and Engineering Principles & Practise I	6
MLE1002 Materials Science and Engineering Principles & Practise II	6
MSE Discipline Requirements:	
MSE Core Modules [4]	**26**
MLE2101 Introduction to Structure of Materials	4
MLE2102 Thermodynamics and Phase Diagrams	4
MLE2103 Phase Transformation and Kinetics	3
MLE2104 Mechanical Properties of Materials	4
MLE2105 Electronic Properties of Materials	4
MLE3101 Materials Characterization Laboratory	3

MLE3111 Materials Processing Laboratory	4
MSE Design and Final-Year Project Modules	**16**
MLE4102 Design Project	4
MLE4101 B.Eng. Dissertation [5]	12
MSE Technical Elective	**20**
MLE Level 2000/3000 Electives	12
MLE Level 4000 Electives	8
Pathway Requirements	**8**
MLE Level 5000 Electives	8
Internships Requirement	**10**
EG3611A Industrial Attachment Programme [6, 7]	10
TOTAL	**160**

1. Students who have not passed or been exempted from the Qualifying English Test at the time of admissions to the Faculty will have to read ES1000 and/or ES1103. This will be decided by CELC.
2. Bridging Module: Students without A-Level pass in Physics must read PC1221 Fundamentals of Physics I and PC1222 Fundamentals of Physics II as a prerequisite for PC1432.
3. Bridging Module: Students without A-level pass in Chemistry must read CM1417 Fundamentals of Chemistry as a prerequisite for CM1501.
4. The relevant departments reserve the right to decide the modules to be offered in any given semester.
5. Over two semesters.
6. For BEng students in the following special programmes: DDPs, CDPs, GEP & CSP, internship / industrial-attachment is optional and the modular credits for the internship/industrial-attachment will be become 'Free Electives' i.e., Unrestricted Electives (UE).

7. RfP students will have to carry out internship in Research Institutions or R&D Labs.

Requirements for Research-Focused Pathway

- RfP students will have to carry out internship in Research Institutions or R & D Labs.
- RfP students will have to work on research based FYP over two semesters.
- RfP student will have to work on a team Design project over one semester.
- RfP students will have to complete two Level-5000 modules as their pathway requirements (8MCs). Any MLE coded module at 5000 level can satisfy this requirement.

Table 3.2.9b: Summary of MSE Module Requirements and Credits for Professional Practice Pathway

Modular Requirements	**MCs**
UNIVERSITY LEVEL REQUIREMENTS	**20**
General Education Modules (GE) (5 Modules, each of 4 MCs) Human Cultures (HC) Quantitative Reasoning (QR) Thinking and Expression (T&E) Singapore Studies (SS) Asking Questions (AQ)	20

UNRESTRICTED ELECTIVES	**32**
Faculty Requirements:	**6**
EG2401A Engineering Professionalism	2
ES1531 Critical Thinking & Writing	4
English [1]	–
1st Year Requirements:	**24**
MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2
PC1432 Physics IIE [2]	4

			CM1501 Organic Chemistry for Engineers or CM1121 Organic Chemistry 1 [3]	4
			MLE1001 Materials Science and Engineering Principles & Practise I	6
			MLE1002 Materials Science and Engineering Principles & Practise II	6
			MSE Discipline Requirements:	
			MSE Core Modules [4]	**26**
			MLE2101 Introduction to Structure of Materials	4
			MLE2102 Thermodynamics and Phase Diagrams	4
			MLE2103 Phase Transformation and Kinetics	3
			MLE2104 Mechanical Properties of Materials	4
			MLE2105 Electronic Properties of Materials	4

			MLE3101 Materials Characterization Laboratory	3	
			MLE3111 Materials Processing Laboratory	4	
			MSE Design and Final-Year Project Modules	**14**	
			MLE4102A Design Project [5]	8	
			MLE4101A B.Eng. Dissertation	6	
			MSE Technical Elective	**20**	
			MLE Level 2000/3000 Electives	12	
			MLE Level 4000 Electives	8	
			Pathway Requirement	**8**	
			Professional Electives	8	
			Internships Requirement	**10**	

EG3611A Industrial Attachment Programme [6, 7]	10
TOTAL	**160**

1. Students who have not passed or been exempted from the Qualifying English Test at the time of admissions to the Faculty will have to read ES1000 and/or ES1103. This will be decided by CELC.
2. Bridging Module: Students without A-Level pass in Physics must read PC1221 Fundamentals of Physics I and PC1222 Fundamentals of Physics II as a prerequisite for PC1432.
3. Bridging Module: Students without A-level pass in Chemistry must read CM1417 Fundamentals of Chemistry as a prerequisite for CM1501.
4. The relevant departments reserve the right to decide the modules to be offered in any given semester.
5. Over two semesters.
6. For BEng students in the following special programmes: DDPs, CDPs, GEP & CSP, internship / industrial-attachment is optional and the modular credits for the internship/industrial-attachment will be become 'Free Electives' i.e., Unrestricted Electives (UE).
7. PPP students will have to carry out internship in industrial companies.

Requirements for Professional Practice Pathway

- PPP students will have to carry out internship in industrial companies.
- RPP students will have to work on research based FYP over one semester.
- PPP student will have to work on a team Design project over two semesters.
- PPP students will have to take 8 MCs of professional development modules as their pathway requirements, one of which needs to be related to project management.

Table 3.2.9c: Summary of MSE Module Requirements and Credits for Design Centric Pathway

Modular Requirements	**MCs**

			UNIVERSITY LEVEL REQUIREMENTS	**20**
			General Education Modules (GE) (5 Modules, each of 4 MCs) Human Cultures (HC) Quantitative Reasoning (QR) Thinking and Expression (T&E) Singapore Studies (SS) Asking Questions (AQ)	20
			UNRESTRICTED ELECTIVES	**28**
			Faculty Requirements:	**6**
			EG2401A Engineering Professionalism	2

ES1531 Critical Thinking & Writing	4
English [1]	–
1st Year Requirements:	24
MA1512 Differential Equations for Engineering	2
MA1513 Linear Algebra with Differential Equations	2
PC1432 Physics IIE [2]	4
CM1501 Organic Chemistry for Engineers or CM1121 Organic Chemistry 1 [3]	4
MLE1001 Materials Science and Engineering Principles & Practise I	6
MLE1002 Materials Science and Engineering Principles & Practise II	6
MSE Discipline Requirements:	

			MSE Core Modules [4]	**26**
			MLE2101 Introduction to Structure of Materials	4
			MLE2102 Thermodynamics and Phase Diagrams	4
			MLE2103 Phase Transformation and Kinetics	3
			MLE2104 Mechanical Properties of Materials	4
			MLE2105 Electronic Properties of Materials	4
			MLE3101 Materials Characterization Laboratory	3
			MLE3111 Materials Processing Laboratory	4
			MSE Design and Final-Year Project Modules	**24**
			EG3301R DCP Project [5]	12
			EG4301 DCP B.Eng. Dissertation [5]	12

MLE Technical Elective	**20**
MLE Level 2000/3000 Electives	12
MLE Level 4000 Electives	8
Pathway Requirement Electives	**8**
Innovation & Enterprise Electives	8
Internships Requirement	**6**
EG3612 Vacation Internship Programme [6]	6
TOTAL	**162**

1. Students who have not passed or been exempted from the Qualifying English Test at the time of admissions to the Faculty will have to read ES1000 and/or ES1103. This will be decided by CELC.
2. Bridging Module: Students without A-Level pass in Physics must read PC1221 Fundamentals of Physics I and PC1222 Fundamentals of Physics II as a prerequisite for PC1432.
3. Bridging Module: Students without A-level pass in Chemistry must read CM1417 Fundamentals of Chemistry as a prerequisite for CM1501.
4. The relevant departments reserve the right to decide the modules to be offered in any given semester.
5. Over two semesters.

			6. For BEng students in the following special programmes: DDPs, CDPs, GEP & CSP, internship / industrial-attachment is optional and the modular credits for the internship/industrial-attachment will be become 'Free Electives' i.e., Unrestricted Electives (UE). Table 3.2.9d: MSE Elective Modules MLE LEVEL 2000/3000 ELECTIVES MLE2106 Metallic Materials and Processing MLE2107 Ceramic Materials and Processing MLE3102 Degradation and Failure of Materials MLE3104 Polymeric and Composite Materials MLE3105 Dielectric and Magnetic Materials MLE3202 Materials for Biointerfaces MSE LEVEL 4000 ELECTIVES POLYMERIC AND BIOMEDICAL MATERIALS (Two modules from this group are required for the specialisation) MLE4201 Advanced Materials Characterisation MLE4202 Selected advanced Topics on Polymers MLE4203 Polymeric Biomedical Materials ME4253 Biomaterials Engineering BN4109 Special topics in Bioengineering BN4301 Principles of Tissue Engineering CM4266 Current Topics in Materials Chemistry PC4268 Biophysical Instrumentation and Biomolecular Electronics NANOSTRUCTURED MATERIALS & NANOTECHNOLOGY (Two modules from this group are required for the specialisation) MLE4201 Advanced Materials Characterisation MLE4204 Synthesis and Growth of Nanostructures MLE4205 Theory & Modelling of Material Properties MLE4206 Current topics on Nanomaterials MLE4208 Photovoltaic Materials MLE4210 Materials for Energy Storage and Conversion PC4253 Thin film Technology CN4223R Microelectronic Thin Films OTHER ELECTIVE MODULES MLE4207 Growth Aspects of Semiconductor or EE4436 Semiconductor Process Technology MLE4209 Magnetism and Magnetic Materials

EE4437 Photonics – Principles and Applications
CN4217R Processing of Microelectronic Materials
CN4203R Polymer Engineering
CN5251 Membrane Science and Technology
ME4283 Micro-fabrication Process
ME4293 Microelectronics Packing

URL: http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-materials-science-and-engineering/recommended-semester-schedule/

3.2.9.3 Recommended Semester Schedule

Home / NUS Bulletin AY2017/18 / https://bulletin.nus.edu.sg/nusbulletin-staging/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-mechanical-engineering/degree-requirements/ / Undergraduate Education / Bachelor of Engineering Degree Programmes / Bachelor of Engineering (Materials Science & Engineering) / Recommended Semester Schedule

Table 3.2.9e: Recommended Semester Schedule for Research-focused Pathway

Module	**MCs**	**Module**	**MCs**
Semester 1		**Semester 2**	
MLE1001 Materials Science and Engineering Principles & Practise I	6	MLE1002 Materials Science and Engineering Principles & Practise II	6
CM15101 Organic Chemistry for Engineers [1]	4	MA1512 Differential Equations for Engineering	2

					MA1513 Linear Algebra with Differential Equations	2
			GE on QR or T&E	4	PC1432 Physics IIE [3]	4
			GE on SS	4	GE/UE	4
			ES1531 Critical Thinking & Writing	4	GE/UE	4
			English [2]	–		
			Sub-total	**22**	**Sub-total**	**22**
			Semester 3		**Semester 4**	
			MLE2101 Introduction to Structure of Materials	4	MLE2104 Mechanical Properties of Materials	4
			MLE2102 Thermodynamics and Phase Diagrams	4	MLE2105 Electronic Properties of Materials	4

			MLE2103 Phase Transformation and Kinetics	3	MLE3101 Materials Characterization Laboratory	3
			GE/UE	4	GE/UE	4
			GE on QR or T&E	4	GE/UE	4
					GE/UE	4
			Sub-total	**19**	**Sub-total**	**23**
			Semester 5 #		**Semester 6 #**	
			MLE3111 Materials Processing Laboratory	4	EG3611A Industrial Attachment Programme	10
			MLE Level 2000/3000 Elective	4	MLE Level 2000/3000 Elective	4
			MLE Level 2000/3000 Elective	4		
			GE/UE	4		

			GE/UE	4		
			Sub-total	**20**	**Sub-total**	**14**
			Semester 7		**Semester 8**	
			MLE4101 B.Eng. Dissertation	6	MLE4101 B.Eng. Dissertation	6
			MLE4102 Design Project	4	EG2401A Engineering Professionalism	2
			MLE Level 4000/5000 Electives	4	MLE Level 4000/5000 Electives	4
			MLE Level 4000/5000 Electives	4	UE	4
			MLE Level 4000/5000 Electives	4	UE	2
			Sub-total	**22**	**Sub-total**	**18**
			Total MCs			**160**
			[1] Bridging Module: Students without A-level pass in Chemistry must read CM1417 Fundamentals of Chemistry as a prerequisite for CM1501.			

[2] Students who score a Band 1 or Band 2 in Qualifying English Test (QET) have to read ES1103 and will be awarded with a 4 MCs upon successful completion of the module.
[3] Bridging Module: Students without A-Level pass in Physics must read PC1221 Fundamentals of Physics I and PC1222 Fundamentals of Physics II as a prerequisite for
Semesters 5 & 6 are interchangeable so that students can go on industrial attachment in either semester.

Table 3.2.9f: Recommended Semester Schedule for Professional Practice Pathway

Module	**MCs**	**Module**	**MCs**
Semester 1		**Semester 2**	
MLE1001 Materials Science and Engineering Principles & Practise I	6	MLE1002 Materials Science and Engineering Principles & Practise II	6
CM15101 Organic Chemistry for Engineers [1]	4	MA1512 Differential Equations for Engineering	2
		MA1513 Linear Algebra with Differential Equations	2
GE on QR or T&E	4	PC1432 Physics IIE [3]	4
GE on SS	4	GE/UE	4
ES1531 Critical Thinking & Writing	4	GE/UE	4

			English [2]	–		
			Sub-total	**22**	**Sub-total**	**22**
			Semester 3		**Semester 4**	
			MLE2101 Introduction to Structure of Materials	4	MLE2104 Mechanical Properties of Materials	4
			MLE2102 Thermodynamics and Phase Diagrams	4	MLE2105 Electronic Properties of Materials	4
			MLE2103 Phase Transformation and Kinetics	3	MLE3101 Materials Characterization Laboratory	3
			GE/UE	4	GE/UE	4
			GE on QR or T&E	4	GE/UE	4
					GE/UE	4
			Sub-total	**19**	**Sub-total**	**23**
			Semester 5 #		**Semester 6 #**	

			MLE3111 Materials Processing Laboratory	4	EG3611A Industrial Attachment Programme	10
			MLE Level 2000/3000 Elective	4	MLE Level 2000/3000 Elective	4
			MLE Level 2000/3000 Elective	4		
			GE/UE	4		
			GE/UE	4		
			Sub-total	**20**	**Sub-total**	**14**
			Semester 7		**Semester 8**	
			MLE4101A B.Eng. Dissertation	6	MLE4102A Design Project	4
			MLE4102A Design Project	4	MLE Level 4000/Professional Electives	4
			MLE Level 4000/Professional Electives	4	MLE Level 4000/Professional Electives	4
			MLE Level 4000/Professional Electives	4	UE	4
					UE	4

		EG2401A Engineering Professionalism	2
Sub-total	**18**	**Sub-total**	**22**
Total MCs			**160**

[1] Bridging Module: Students without A-level pass in Chemistry must read CM1417 Fundamentals of Chemistry as a prerequisite for CM1501.
[2] Students who score a Band 1 or Band 2 in Qualifying English Test (QET) have to read ES1103 and will be awarded with a 4 MCs upon successful completion of the module.
[3] Bridging Module: Students without A-Level pass in Physics must read PC1221 Fundamentals of Physics I and PC1222 Fundamentals of Physics II as a prerequisite for
Semesters 5 & 6 are interchangeable so that students can go on industrial attachment in either semester.

Table 3.2.9g: Recommended Semester Schedule for Design Centric Pathway

Module	**MCs**	**Module**	**MCs**
Semester 1		**Semester 2**	
MLE1001 Materials Science and Engineering Principles & Practise I	6	MLE1002 Materials Science and Engineering Principles & Practise II	6

			CM15101 Organic Chemistry for Engineers [1]	4	MA1512 Differential Equations for Engineering	2
					MA1513 Linear Algebra with Differential Equations	2
			GE on QR or T&E	4	PC1432 Physics IIE [3]	4
			GE on SS	4	GE/UE	4
			ES1531 Critical Thinking & Writing	4	EG2201A Introduction to Design Thinking (UE)	4
			English [2]	–		
			Sub-total	**22**	**Sub-total**	**22**
			Semester 3		**Semester 4**	
			MLE2101 Introduction to Structure of Materials	4	MLE2104 Mechanical Properties of Materials	4
			MLE2102 Thermodynamics and Phase Diagrams	4	MLE2105 Electronic Properties of Materials	4

			MLE2103 Phase Transformation and Kinetics	3	MLE3101 Materials Characterization Laboratory	3
			EG2301 Case Studies in Engineering (UE)	4	EG3301R DCP Project	6
			GE on QR or T&E	4	GE/UE	4
			Sub-total	**19**	**Sub-total**	**21**
			Special Term			
			EG3612 Vacation Internship Programme	6		
			Sub-total	**6**		
			Semester 5		**Semester 6**	
			MLE3111 Materials Processing Laboratory	4	MLE Level 2000/3000 Elective	4
			MLE Level 2000/3000 Elective	4	MLE Level 4000 Elective	4
			MLE Level 2000/3000 Elective	4	GE/UE	4

			EG3301R DCP Project	6	GE/UE	4
					GE/UE	4
			Sub-total	**18**	**Sub-total**	**20**
			Semester 7		**Semester 8**	
			EG4301 DCP B.Eng. Dissertation	6	EG4301 DCP B.Eng. Dissertation	6
			MLE Level 4000 Elective	4	Innovation & Enterprise Elective (UE)	4
			Innovation & Enterprise Elective	4	UE	4
			Innovation & Enterprise Elective	4	EG2401A Engineering Professionalism	2
			Sub-total	**18**	**Sub-total**	**16**

			Total MCs			**162**

[1] Bridging Module: Students without A-level pass in Chemistry must read CM1417 Fundamentals of Chemistry as a prerequisite for CM1501.
[2] Students who score a Band 1 or Band 2 in Qualifying English Test (QET) have to read ES1103 and will be awarded with a 4 MCs upon successful completion of the module.
[3] Bridging Module: Students without A-Level pass in Physics must read PC1221 Fundamentals of Physics I and PC1222 Fundamentals of Physics II as a prerequisite for PC1432.

35.	26 Apr 2018	FoE	http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/bachelor-of-engineering-degree-programmes/bachelor-of-engineering-industrial-and-systems-engineering/degree-requirements/

Bulletin AY2017/2018

Changes are highlighted in yellow:

3.2.8.2 Degree Requirements

Table 3.2.8a: Summary of Modular Requirements and Credits for Practicing Professional Pathway (PPP)

Modular Requirements	MCs Option 1	MCs Option 2	MCs Option 3
Faculty Requirements	6	6	6
ES1531 Critical Thinking and Writing	4	4	4
EG2401**A** Engineering Professionalism	2	2	2
ES1xxx English [1]			
ISE Foundation Requirements	20	20	20
MA1505 Mathematics I	4	4	4
MA1508E Linear Algebra	4	4	4
CS1010E Programming Methodology	4	4	4
Basket of ~~PPP~~ **Science** Modules (PC1431/PC1432)	4	4	4
ST2334 Probability and Statistics	4	4	4

Table 3.2.8b: Summary of Modular Requirements and Credits for Research-focused Pathway (RfP)

Modular Requirements	MCs
Faculty Requirements	**6**
ES1531 Critical Thinking and Writing	4
EG2401A Engineering Professionalism	2
ES1xxx English [1]	
ISE Foundation Requirements	**20**
MA1505 Mathematics I	4
MA1508E Linear Algebra	4
CS1010E Programming Methodology	4
Basket of ~~PPP~~ **Science** Modules (PC1431/PC1432)	4
ST2334 Probability and Statistics	4

Table 3.2.8c: Summary of Modular Requirements and Credits for Innovation & Design Centric Pathway (iDCP)

Modular Requirements	MCs
Faculty Requirements	**6**
ES1531 Critical Thinking and Writing	4
EG2401A Engineering Professionalism	2
ES1xxx English [1]	
ISE Foundation Requirements	**20**
MA1505 Mathematics I	4

			MA1508E Linear Algebra 4 CS1010E Programming Methodology 4 Basket of ~~PPP~~ **Science** Modules (PC1431/PC1432) 4 ST2334 Probability and Statistics 4 Table 3.2.8d: Basket of Modules for Research-focused Pathway Requirements **Modules** IE5108 Facility Layout and Location IE5202 Applied Forecasting Systems IE5203 Decision Analysis IE5205 Healthcare Systems and Analytics IE5213 Service Innovation and Management IE5407 Flexibility in Engineering Systems Design IE6001 ~~Mathematical Programming for Engineering~~ Foundations of Optimization IE6002 Advanced Engineering Statistics IE6005 Stochastic Models and Optimization Table 3.2.8e: List of ISE Electives

			ISE Technical Electives IE3105 Fundamentals of Systems Engineering and Architecture IE3120 Manufacturing Logistics IE4210 Operations Research II IE4211 Modelling and Analytics IE4220 Supply Chain Modelling IE4221 Transportation Demand Modelling and Economics IE4229 Selected Topics in Logistics IE4230 Quality Engineering II IE4239 Selected Topics in Quality Engineering IE4240 Project Management IE4241 Work, Technology and Organization IE4242 Cost Analysis and Management IE4243 Decision Modeling and Risk Analysis IE4244 Energy: Security, Competitiveness and Sustainability IE4249 Selected Topics in Engineering Management IE4250 System Dynamics Modelling IE4251 Process Analysis and Redesign IE4259 Selected Topics in Systems Engineering IE4299 Selected Topics in Industrial Engineering

			IE5108 Facility Layout and Location IE5121 Quality Planning and Management IE5203 Decision Analysis IE5213 Service Innovation and Management IE5301 Human Factors in Engineering and Design IE5307 Topics in Human Factor Engineering MT4002 Technology Management Strategy MT5002 Management of Industrial R&D

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td>36.</td><td>14 Jul 2017</td><td>NUSMed</td><td>2. Key Contact Information section: http://www.nus.edu.sg/nusbulletin/yong-loo-lin-school-of-medicine/key-contact-information/

Changes to make in red below:
For up-to-date information, please visit the School's website at http://nusmedicine.nus.edu.sg/about)

<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 YEOH Khay Guan</td><td>Dean</td><td>3732</td><td>meddean</td></tr>
<tr><td>Assoc Prof LAU Tang Ching</td><td>Vice-Dean (Education)</td><td>6193</td><td>mdcltc</td></tr>
<tr><td>Prof ~~Prof~~ HO Khek Yu</td><td>Vice-Dean (Research)</td><td>4362</td><td>mdchoky</td></tr>
<tr><td>Assoc Prof SU Lin Lin</td><td>Vice-Dean (Academic Affairs)</td><td>4273</td><td>obgsll</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Assoc Prof CHONG Yap Seng</td><td>Vice-Dean (Academic Medicine)</td><td>4272</td><td>obgcys</td></tr>
<tr><td>Assoc Prof LIM Yu-Tang Aymeric</td><td>Vice-Dean (Leadership Development & Strategy)</td><td>4125</td><td>doslima</td></tr>
<tr><td>Mr TEO Kheng Lin Stewart</td><td>Vice-Dean (Finance)</td><td>3811</td><td>medtkls</td></tr>
<tr><td>Mr SIM Tiong Kian</td><td>Director (Administration)</td><td>3788</td><td>medsimt</td></tr>
<tr><td>Mr LIM Teck Hau, Michael</td><td>Director (Corporate Communications)</td><td>3988</td><td>medlthm</td></tr>
</table>
</td></tr>
<tr><td>37.</td><td>3 Jul 2017</td><td>FoS</td><td>Amendments need to be made to the Physics-MSE Double Degree Programme Requirements.
AY2017/18 Bulletin: http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/double-degree-programmes/double-degree-in-materials-sciences-and-engineering-and-physics/graduation-requirements/
Kindly make the amendments in red:

Table 2: Summary of Requirements for BEng in MSE and BSc (Hons) in Physics</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Modular Requirements	MCs
University Requirements	20
General Education Modules (GE) (5 Modules, each of 4MCs) • Human Cultures (HC) • Quantitative Reasoning (QR) • Thinking and Expression (T&E) • Singapore Studies (SS) • Asking Questions (AQ)	20
ES1103 English for Academic Purposes[b]	–
Faculty Requirements (BEng)	11
ES1531 Critical Thinking & Writing[a]	4
ES2331 Communicating Engineering	4
EG2401 Engineering Professionalism	3
Faculty Requirements (BSc)	12
CM1121 Basic Organic Chemistry OR CM1501 Organic Chemistry For Engineers[c]	4
MA1101R Linear Algebra I	4
CS1010E Programming Methodology[d]	4
Major Requirements	
Level-1000 Essential Modules (BEng)	12
MA1102R Calculus[f]	4
MLE1111 Foundations of Materials Science & Engineering I	4
MLE1112 Foundations of Materials Science & Engineering II	4
Level-1000 Essential Modules (BSc)[e]	16
PC1141 Introduction to Classical Mechanics	4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

PC1142 Introduction to Thermodynamics and Optics	4
PC1143 Introduction to Electricity & Magnetism	4
PC1144 Introduction to Modern Physics	4
Level-2000 Essential Modules (BEng)	20
MLE2101 Introduction to Structure of Materials	4
MLE2102 Thermodynamics and Phase Diagrams	3
MLE2103 Phase Transformation and Kinetics	3
MLE2104 Mechanical Properties of Materials	4
MLE2105 Electronic Properties of Materials	3
MLE2111 Materials Properties Laboratory	3
Level-2000 Essential Modules (BSc)	24
PC2130 Quantum Mechanics I	4
PC2131 Electricity and Magnetism I	4
PC2132 Classical Mechanics	4
PC2134 Mathematical Methods in Physics 2	4
PC2230 Thermodynamics and Statistical Mechanics	4
PC2193 Experimental Physics I	4
Level-3000 Essential Modules (BEng)	11
MLE3103 Materials Design and Selection	4
MLE3101 Materials Characterization Laboratory	4
MLE3111 Materials Processing Laboratory	3
Level-3000 Essential Modules (BSc)	8
PC3130 Quantum Mechanics II	4
PC3193 Experimental Physics II	4
Level-2000/3000 Elective Modules (BEng)[h]	12-16

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			MLE2106 Metallic Materials and Processing MLE2107 Ceramic Materials and Processing MLE3102 Degradation and Failure of Materials MLE3104 Polymeric and Composite Materials MLE3105 Dielectric and Magnetic Materials MLE3202 Materials for Biointerfaces	
			Level-3000 Elective Modules (BSc)	8
			Choose any **TWO** modules from the following: (All modules are worth 4 MCs unless otherwise stated) 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 PC3241 Solid State Devices	.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			PC3242 Physics of Semiconductor Processing PC3243 Photonics PC3246 Astrophysics I PC3247 Modern Optics PC3251 Nanophysics PC3267 Biophysics II PC3274 Mathematical Methods in Physics II PC3239 Special Problems in Undergraduate Physics II PC3288 UROPS in Physics I PC3289 Advanced UROPS in Physics II	
			Level-4000 Essential Modules (BEng)	20
			MLE4102 Design Project	4
			Level-4000 Essential (BSc)	
			None	
			Level-4000 Essential (Dissertation)	
			MLE4101R Integrated BEng/BSc (Hons) Dissertation (over two semesters) OR PC4199R Integrated BEng/BSc (Hons) Dissertation (over two semesters)	16
			Level-4000 Elective Modules (BEng)[i]	12-16

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Complete at least **<u>12-16 MCs</u>** (of which at least two modules must be MLE4xxx) from the following group of electives: (All modules are worth 4 MCs unless otherwise stated) <u>Polymeric and Biomedical Materials</u> (four modules from this group are required for the specialisation, together with BEng specialised Dissertation) MLE4201 Advanced Materials Characterisation MLE4202 Selected advanced Topics on Polymers MLE4203 Polymeric Biomedical Materials ME4253 Biomaterials Engineering BN3301 Introduction to Biomaterials BN4109 Special topics in Bioengineering BN4301 Principles of Tissue Engineering CM4266 Current Topics in Materials Chemistry PC4268 Biophysical Instrumentation and Biomolecular Electronics <u>Nanostructured Materials & Nanotechnology</u> (four modules from this group are required for the specialisation, together with BEng specialised Dissertation) MLE4201 Advanced Materials Characterisation

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			MLE4204 Synthesis and Growth of Nanostructures MLE4205 Theory & Modelling of Material Properties MLE4206 Current topics on Nanomaterials MLE4208 Photovoltaic Materials MLE4210 Materials for Energy Storage and Conversion PC4253 Thin film Technology CN4223R Microelectronic Thin Films (3 MCs)
			Other Elective Modules MLE4207 Growth Aspects of Semiconductors or EE4436 Semiconductor Process Technology MLE4209 Magnetism and Magnetic Materials EE4437 Photonics – Principles and Applications CN4217R Processing of Microelectronic Materials (3 MCs) CN4203R Polymer Engineering CN5251 Membrane Science and Technology ME4283 Micro-fabrication Process ME4293 Microelectronics Packaging

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Level-4000 Elective Modules (BSc)	20
Choose any FIVE modules from the following (All modules are worth 4 MCs unless otherwise stated) ~~PC4130~~ PC4230 Quantum Mechanics III PC4232 Cosmology PC4240 Solid State Physics II PC4241 Statistical Mechanics PC4242 Electrodynamics PC4243 Atomic and Molecular Physics II PC4245 Particle Physics PC4246 Quantum Optics PC4248 General Relativity PC4249 Astrophysics II PC4253 Thin Film Technology PC4259 Surface Physics	–
PC4262 Remote Sensing PC4267 Biophysics III PC4268 Biophysical Instrumentation and Biomolecular Electronics PC4274 Mathematical Methods in Physics III ~~EE4401~~ EE4437 Optoelectronics EE4413 Low-dimensional Electronic Devices MLE4201 Advanced Materials Characterisation[g] MLE4204 Synthesis and Growth of Nanostructures[g] MLE4205 Theory and Modelling of Materials Properties[g] Any approved module offered by other Departments	
Total	210

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
38.	4 Jul 2017	FoS	The Cessation of Chemical Sciences Programme wef AY2017/18 Cohort has been approved via Senate Circular 8 of AY2016/17. Section 3.4.4 Chemical Sciences Programme was deleted from the content page of the FoS AY2017/18 Bulletin and also the contents within. The subsequent items were re-numbered accordingly.
39.	12 Jul 2017	FoS	**Change #1** Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/master-of-science-in-pharmaceutical-sciences-and-technology/ **Programme Structure** Candidates admitted into the programme must read and pass a total of ten modules (40 MCs), comprising ~~six~~ three essential modules and ~~four~~ seven elective modules: ~~Six~~ Three Essential Modules, 4 MCs each: ~~1.PR5301 Food and Drug Laws~~ ~~2.PR5302 Regulation of Drug Development~~ ~~3.PR5303 Good Regulatory Practices~~ ~~4.PR5213 Pharmaceutical Process Validation~~ ~~5.PR5217 Formulation Science~~ ~~6.PR5218 Practical in Product Development (Laboratory Rotation)~~ 1. PR5211 Pharmaceutical Analysis IV 2. PR5217 Formulation Science 3. PR5218 Practical In Product Development – Lab Rotation ~~Four~~ Seven Elective Modules, 4 MCs each – choose from the following: ~~1.PR5211 Pharmaceutical Analysis IV~~ ~~2.PR5212 Advanced Topics in Medicinal Chemistry~~ ~~3.PR5214 Advances in Tablet Technology~~ ~~4.PR5216 Advances in Drug Delivery~~ ~~5.PR5219 Product Quality Management~~ ~~6.PR5220 Bioprocess Technology~~

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			~~7.PR5221 Molecular Targets in Drug Discovery~~ ~~8.PR5222 Drug Metabolism~~ Group A Cluster: Process & Technology 1. PR5213 Pharmaceutical Process Validation 2. PR5214 Advances in Table Technology 3. PR5216 Advances in Drug Delivery 4. PR5220 Bioprocess Technology 5. PR5223 Advances Biomaterial Design Group B Cluster: Regulatory & Management 1. PR5115 Drug Information, Critical Literature Evaluation and Biostatistics 2. PR5219 Product Quality Management 3. PR5230 Pharmacoeconomics and Outcomes Research 4. PR5302 Regulation of Drug Development 5. PR5303 Good Regulatory Practices
40.	21 Jul 2017	FoS	**The changes to the Minor in Analytical Chemistry requirement to replace CM2142, which will be defunct from AY2017/18 onwards, with CM2192, for all existing cohorts, has been approved via BUS Circular 28 of AY2016/17.** **AY2017/18 Bulletin** **Under 3.4.3.1 Minor in Analytical Chemistry http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-analytical-chemistry/ , kindly make the following updates.** **To be awarded a minor in Analytical Chemistry, a student must pass all the following six modules:** **1. CM1401 and CM1111 Chemistry for Life Sciences and Inorganic Chemistry 1 OR** **2. CM1402 and CM1191 General Chemistry and Experiments in Chemistry 1** **3. CM2101 Physical Chemistry 2** **4. CM2142 Analytical Chemistry 1 OR CM2192 Experiments in Chemistry 2** **5. CM3242 Instrumental Analysis II** **6. CM3295 Selected Experiments in Analytical Chemistry**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
41.	21 Jul 2017	FoS	The changes to replace CM2142 with CM3242 within the Minor in Forensic Science Requirement for all existing cohorts, was approved via BUS Circular 28 of AY201617. AY2017/18 Bulletin Under 3.4.3.6 Minor in Forensic Science http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-forensic-science/ , kindly make the following updates: To be awarded a minor in Forensic Science, a student must pass the six modules as set out below: 1. GEK1542 ~~(~~or LSM1306~~)~~ Forensic Science 2. CM3301 Advanced Forensic Science 3. SP3202 Evidence in Forensic Science 4. Choose 3 from the following elective modules: ○ CM2101 Physical Chemistry 2 ○ CM2142 Analytical Chemistry1 OR CM3242 Instrumental Analysis II ○ LSM1102 Molecular Genetics ○ LSM3211 Fundamental Pharmacology
42.	21 Jul 2017	FoS	The change to remove CM2142 from the Chemistry 2nd major requirements, for cohort AY2016 and after, was approved via BUS Circular 28 of AY2016/17. **AY2017/18 Bulletin** Under 3.4.2.1 Second Major in Chemistry http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/second-major-programmes/chemistry/ , please make the following updates: To be awarded a BSc with a second major in Chemistry, candidates must satisfy the following:

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Module Level</th><th>Second Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>Level-1000

(16 MCs)</td><td>Pass

CM1111 Inorganic Chemistry 1

CM1121 Organic Chemistry 1

CM1131 Physical Chemistry 1

CM1191 Experiments in Chemistry 1 Processes</td><td>16</td></tr>
<tr><td>Level-2000

(16 MCs)</td><td>Pass ~~any three (3) modules from the following:~~

• CM2101 Physical Chemistry 2
• CM2111 Inorganic Chemistry 2
• CM2121 Organic Chemistry 2
• ~~CM2142 Analytical Chemistry 1~~

Pass any one module from the following:

• CM2191 Experiments in Chemistry 2
• CM2192 Experiments in Chemistry 3</td><td>32</td></tr>
<tr><td>Level-3000

(16 MCs)</td><td>Pass

CM3291 Advanced Experiments in Inorganic and Organic Chemistry

or</td><td>48</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>CM3292 Advanced Experiments in Analytical and Physical Chemistry

and <u>three</u> (3) other CM32XX modules (excluding CM3289)*</td><td></td></tr>
</table>

* UROPS CM3288 can be counted as 4 MCs. However, if two semesters work of UROPS is completed, CM3289 will not be counted.

This second major is <u>not</u> awarded with a primary major in Chemistry or a minor in Analytical Chemistry.

Note:
Level-4000 CM prefixed modules may be taken to replace up to 4 MCs of the Level-3000 CM elective modules above.</td></tr>
<tr><td>43.</td><td>21 Jul 2017</td><td>FoS</td><td>The FST curriculum revision, to increase UE space to 32MC for the BSc(Hons) programme for cohort AY2017/18 and after, has been approved via BUS Circular 28 of AY2016/17.

The following changes need to be made to the FST major requirements in the AY2017/18 bulletin:

http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/food-science-and-technology/

<table>
<tr><th>Module Level</th><th>Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000

(24 MCs)</td><td>Pass

CM1501 Organic Chemistry for Engineers</td><td>24</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
				CM1191 Experiments in Chemistry 1 FST1101 Science and Technology of Foods FST1103 Fundamentals of Food Engineering LSM1106 Molecular Cell Biology ST1232 Statistics for Life Sciences For students without H2/A-level equivalent Biology, pass: LSM1301 General Biology	
			2000 (~~24~~ 20 MCs)	Pass FST2102B Chemistry of Food Components FST2106 Post Harvest Food Processing FST2107 Food Analysis and Lab FST2108 Food Safety Assurance LSM2211 Metabolism and Regulation ~~LSM2191 Laboratory Techniques in Life Sciences~~	~~48~~ 44
			3000	Pass	~~68~~ 64

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			(20 MCs)	FST3101 Food Microbiology and Fermentation FST3103 Advanced Food Engineering FST3105 Food Product Development and Packaging FST3106 Sensory and Flavour Science At least 4 MCs from the following: FST3201 Independent Study (Food Science & Technology) FST3202 Nutrition and Disease Prevention FST3203 Vitamins & Minerals in Health & Diseases FST3288 Advanced UROPS (Food Sc. & Tech) I DSC3202 Purchasing & Materials Management CM3242 Instrumental Analysis II	
			4000 (32 MCs)	Pass FST4199 Honours Project in Food Science & Technology	~~100~~ 96

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			FST4102 Advanced Food Processing Technologies FST4103 Food Colloids and Components Science At least 8 MCs from following: FST4201 Current Topics in Food Science and Technology FST4202 Nutritional Biochemistry FST4203 Food Forensics CM4241 Trace Analysis CM4242 Advanced Analytical Techniques CM4267 Current Topics in Analytical Techniques FST5201 Rheology and Textural Properties of Biomaterials FST5202 Advanced Food Fermentation FST5203 Advanced Food Microbiology and Safety FST5204 Evidence Based Functional Foods

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>FST5225 Advanced Current Topics in Food Science

CM5241 Modern Analytical Techniques</td><td></td></tr>
</table>

In addition to the above modules, the department also recommends that students read the following modules to fulfil the unrestricted elective requirement :
MKT1003 Marketing
DSC2006 Operations Management
DSC3218 Physical Distribution Management
FST2201 Introduction to Human Nutrition

<table>
<tr><th>Summary of Requirements</th><th>B.Sc. (FST)</th><th>B.Sc. Hons. (FST)</th></tr>
<tr><td>University Requirements</td><td>20 MCs</td><td>20 MCs</td></tr>
<tr><td>Faculty Requirements</td><td>12 MCs†</td><td>12 MCs ††</td></tr>
<tr><td>Major Requirements</td><td><s>68</s> 64 MCs</td><td><s>100</s> 96 MCs</td></tr>
<tr><td>Unrestricted Elective Modules</td><td><s>20</s> 24 MCs</td><td><s>28</s> 32 MCs</td></tr>
<tr><td>TOTAL</td><td>120 MCs</td><td>160 MCs</td></tr>
</table>

† 16 MCs of Faculty requirements are partially fulfilled through 4 MCs from ST1232 within the major. The remaining 12 MCs are fulfilled through (i) 8 MCs from FST3181 Professional Placement; and (ii) 4 MCs from any one of the following subject groups: Computing Sciences, Physical Sciences, Multidisciplinary & Interdisciplinary Sciences.
†† 20 MCs of Faculty requirements are partially fulfilled through 8 MCs from ST1232 and CM/LSM modules within the major. The remaining 12 MCs are fulfilled through (i) 8 MCs from FST3181 Professional Placement; and (ii) 4 MCs from any one of the following subject groups: Computing Sciences, Physical Sciences, Multidisciplinary & Interdisciplinary.</td></tr>
<tr><td>44.</td><td>21 Jul 2017</td><td>FoS</td><td>The Department of Statistics and Applied Probability’s proposal to revise the Statistics 1st major curriculum for the AY2014/15 cohort and after, to incorporate:</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>

The recoding of MA1104 to MA2104, which overlaps substantially with MA2311, an essential module for Statistics major
Two new modules ST3248 and ST4248 which replace ST4240

Has been approved via BUS Circular 28 of AY2016/17.

<u>AY2017/18 Bulletin</u>

Under 3.3.3.9 Statistics http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/statistics/ , please make the following changes:

Graduation Requirements (Statistics)

To be awarded a B.Sc. or B.Sc. (Hons.) with a primary major in Statistics, candidates must satisfy the following:
<table>
<tr><th>Module Level</th><th>Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>Level-1000 (16 MCs)</td><td>Pass
ST1131 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~~
~~CS1010FC Programming Methodology~~
or
CS1010FX Programming Methodology</td><td>16</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Level-2000 (16-17 MCs)</td><td>Pass
ST2131/ MA2216 Probability
ST2132 Mathematical Statistics
ST2137 Computer Aided Data Analysis
MA2311 Techniques in Advanced Calculus
or
MA2104 Multivariable Calculus
or
MA2108 Mathematical Analysis I
or
MA2108S Mathematical Analysis I (S)</td><td>32-33</td></tr>
<tr><td>Level-3000 (28-29 MCs)</td><td>Pass
ST3131 Regression Analysis
ST3236 Stochastic Processes I
• Three other modules from ST32xx or ST4xxx modules
• Two additional modules from ST32xx or ST4xxx modules or List A or List B modules</td><td>60-62</td></tr>
<tr><td>Level-4000 (32-33 MCs)</td><td>Pass
ST4199 Honours Project in Statistics
ST4231 Computer Intensive Statistical Methods
ST4233 Linear Models
• Two other modules from ST4xxx modules
• One additional module from ST4xxx, ST5xxx or List B modules</td><td>92-94</td></tr>
</table>

List A
MA3209 Mathematical Analysis III
MA3218 Applied Algebra
MA3227 Numerical Analysis II
MA3229 Introduction to Geometric Modelling
MA3233 Combinatorics and Graphs II
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			MA3236 Nonlinear Programming MA3252 Linear and Network Optimisation MA3256 Applied Cryptography MA3259 Mathematical Methods in Genomics MA3269 Mathematical Finance I QF3101 Investment instruments: Theory and Computation CS3230 Design and Analysis of Algorithm CS3223 Database ~~Management~~ Systems Implementation CS3243 Introduction to Artificial Intelligence CS3244 Machine Learning ~~and Neural Networks~~ EC3304 Econometrics II <u>List B</u> MA4211 Functional Analysis MA4229 Approximation Theory MA4230 Matrix Computation MA4233 Dynamical Systems MA4254 Discrete Optimisation ~~MA4269 Mathematical Finance II~~ MA4260 Stochastic Operations Research MA4261 Coding and Cryptography MA4262 Measure and Integration MA4269 Mathematical Finance II CS4231 Parallel and Distributed Algorithms CS4220 Knowledge Discovery Methods in Bioinformatics DSA4211 High-Dimensional Statistical Analysis DSA4212 Optimisation for Large-Scale Data-Driven Inference EC4303 Econometrics III Honours students majoring in Statistics have the option to qualify for specialisation in 1. Data Science or 2. Finance and Business Statistics.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			(A) To be awarded a specialisation in Data Science, a candidate must pass at least six modules (24 MCs) from the following two lists, with at least two modules (8 MCs) from list DS 1, as part of the major requirements for B.Sc. (Hons.) with a primary major in Statistics: **DS 1** ST3240 Multivariate Statistical Analysis CS3244 Machine Learning* ST3248 Statistical Learning I ST4248 Statistical Learning II **DS 2** ST3247 Simulation CS3210 Parallel Computing* MA3252 Linear and Network Optimisation ST4234 Bayesian Statistics CS4231 Parallel and Distributed Algorithms* DSA4211 High-Dimensional Statistical Analysis DSA4212 Optimisation for Large-Scale Data-Driven Inference MA4268 Mathematics for Visual Data Processing* *Modules with hidden pre-requisites (indicated in brackets): CS3210 (CS2100 Computer Organisation), CS3244 (CS2040 ~~CS2010~~ Data Structures and Algorithms ~~II~~), CS4231 (CS3230 Design and Analysis of Algorithms or CS3210 Parallel Computing), MA4268 (MA2213 Numerical Analysis I). For students who wish to read these modules for the Data Science specialisation, the Faculty/Department will provide them with academic advice on their study plans (where necessary) as such students would have to read 'additional' pre-requisite modules. (B) To be awarded a specialisation in Finance and Business Statistics, a candidate must pass at least six modules (24 MCs) from the following two lists, with at least two modules (8 MCs) from each of the lists (FBS 1, FBS 2), as part of the major requirements for B.Sc. (Hons.) with a primary major in Statistics: FBS 1 ST3233 Applied Times Series Analysis ST3234 Actuarial Statistics ST3246 Statistical Models for Actuarial Science

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
MA3269 Mathematical Finance I
ST4245 Statistical Methods for Finance
MA4269 Mathematical Finance II

<u>FBS 2</u>
ST3232 Design and Analysis of Experiments
ST3239 Survey Methodology
ST3242 Introduction to Survival Analysis
ST3244 Demographic Methods
ST4238 Stochastic Processes II

<table>
<tr><th>Summary of Requirements</th><th>B.Sc.</th><th>B.Sc. (Hons.)</th></tr>
<tr><td>University Requirements</td><td>20 MCs</td><td>20 MCs</td></tr>
<tr><td>Faculty Requirements</td><td>8 MCs*</td><td>8 MCs*</td></tr>
<tr><td>Major Requirements</td><td>60-62 MCs</td><td>92-94 MCs</td></tr>
<tr><td>Unrestricted Elective Modules</td><td>30-32 MCs</td><td>38-40 MCs</td></tr>
<tr><td>Total</td><td>120 MCs</td><td>160 MCs</td></tr>
</table>

* Faculty requirements of 12 MCs and 16 MCs [required for the B.Sc. and B.Sc. (Hons.) programmes respectively] are partially fulfilled through the reading of CS~~/IT/CZ~~/MA modules within the major.

Students undertaking the B.Sc. and B.Sc. (Hons.) programmes are required to fulfil the remaining 8 MCs of Faculty requirements from <u>any two</u> (2) of the following subject groups: Chemical Sciences, Life Sciences, Physical Sciences and Multidisciplinary & Interdisciplinary Sciences; but <u>no</u>t from the following groups: Computing Sciences and Mathematical & Statistical Sciences.
</td></tr>
<tr><td>45.</td><td>7 Sep 2017</td><td>FoS</td><td>
NUS Bulletin 2017-18 Updates by FoS (7 Sep 2017)
The revision to the FoS Comp Bio Requirements were approved via BUS Circular 3 of AY2017/18. The following amendments are made to the bulletins:

AY2017/18 Bulletin
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Under 3.3.3.2 Computational Biology http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/computational-biology/ , please make the following amendments:

Graduation Requirements

PROGRAMME REQUIREMENTS		M
University Requirements		
5 x General Education Modules	20	2
Faculty Requirements		
CM1401 Chemistry for Life Sciences [1] LSM1102 Molecular Genetics [1] MA1101R Linear Algebra I SP1541 Exploring Science Communication through Popular Science [2]		1
Major Requirements		
Level-1000 / 2000 Essential [1]		32
CS1010S ~~or CS1010FC~~ or CS1010X Programming Methodology [3]	4	
~~CS1020E or CS1020 Data Structures And Algorithms I~~ CS2040 Data Structures and Algorithms	4	
CS1231 Discrete Structures or MA1100 Fundamental Concepts of Mathematics	4	
LSM1106 Molecular Cell Biology	4	
MA1102R Calculus	4	
CS2220 Introduction to Computational Biology [4] OR LSM2241 Introductory Bioinformatics	4	
LSM2211 Metabolism and Regulation OR LSM2232 Genes and Genomes OR LSM2233 Cell Biology	4	
Either ST2334 Probability and Statistics OR a combined ST2131 Probability and ST2132 Mathematical Statistics*	4 – 8	
Level-3000 Essential		
MA3259 Mathematical Methods In Genomics	4	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			LSM3241 Genomic Data Analysis	4	
			Level-3000 Electives [~~3~~ 4] (Choose Four Modules) – [Any two modules from option A and any two modules from option B] Option A CS2102 Database System CS3103 Computer Networks Practice CS3225 Combinatorial Methods in Bioinformatics CS3230 Design and Analysis of Algorithms CS3240 Interaction Design CS3241 Computer Graphics CS3243 Introduction to Artificial Intelligence CS3244 Machine Learning Option B LSM3211 Fundamental Pharmacology LSM3223 Immunology LSM3225 Molecular Microbiology LSM3231 Protein Structure and Function LSM3232 Microbiology LSM3233 Developmental Biology LSM3243 Molecular Biophysics ~~LSM3244 Molecular Biotechnology~~ PC3267 Biophysics II [5] MA3233 Combinatorics and Graphs II ST3131 Regression Analysis ST3240 Multivariate Statistical Analysis ST3232 Design and analysis of experiments ST3233 Applied time series analysis ST3236 / MA3238 Stochastic Process 1 ST3247 Simulation ST3248 Statistical Learning I		~~24~~ 16
			Level-4000 Essential		20
			ZB4199 Honours Project in Computational Biology	12	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			ZB4171 Advanced Topics in Bioinformatics 4 LSM4241 Functional Genomics 4 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 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 LSM4226 Infection and Immunity LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4242 Protein Engineering Option C MA4251/ ST4238 Stochastic Processes II PC4267 Biophysics III ST4231 Computer Intensive Statistical Methods	12

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

ST4234 Bayesian Statistics ~~ST4235 Simulation~~ ~~ST4240 Data Mining~~ ST4242 Analysis of Longitudinal Data ST4248 Statistical Learning II	
Unrestricted Elective Modules [4]	32 – 36
Total	**160**

Note 1:
Modules are part of the lower division requirements for the Computational Biology Programme.
Note 2:
The following groups of students who are precluded from reading SP1541/ES1541:

- Students who are UTown residents and have read and passed the IEM, UTW and UWC modules
- Students who are RVRC residents and have read and passed ES1601 module
- Students who are in SPS and have read and passed the SP2171
- Students who are in USP and have read and passed the UWC2101% modules

will have to read another module instead of SP1541 to fulfil 4 MCs of Faculty requirements, except for students in SPS who have read and passed SP2171 as SP2171 can be used to fulfil 4 MCs of Faculty Requirements.
Note 3:
CS1101S Programming Methodology (5 MCS) may be read as an alternative to CS1010S. This module is suitable for those with prior experience in Python. Do note that registration to this module is subject to host availability.

Note 3 4:
ZB3288 UROPS in Computational Biology can be taken in fulfilment of 4 MCs from any of the options in the level-3000 elective list.
Note 4 5:
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). In addition, as Computational Biology students already have stipulated Faculty requirements, they would read SP1541 as an Unrestricted Elective.
* 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.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Summary of Requirements</th><th>B.Sc. (Hons.)</th></tr>
<tr><td>University Requirements</td><td>20 MCs</td></tr>
<tr><td>Faculty Requirements</td><td>16 MCs</td></tr>
<tr><td>Major Requirements</td><td>88-92 MCs</td></tr>
<tr><td>Unrestricted Elective Modules</td><td>32-36 MCs</td></tr>
<tr><td>Total</td><td>160 MCs</td></tr>
</table>
</td></tr>
<tr><td>46.</td><td>12 Sep 2017</td><td>FoS</td><td>
The revision to the FoS Comp Bio Requirements were approved via BUS Circular 3 of AY2017/18. Following amendments were made to the bulletins:

AY2017/18 Bulletin
Under 3.3.3.2 Computational Biology http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/computational-biology/ , please make the following amendments:
Graduation Requirements
<table>
<tr><th colspan="2">PROGRAMME REQUIREMENTS</th><th>MCS</th></tr>
<tr><td colspan="3">University Requirements</td></tr>
<tr><td>5 x General Education Modules</td><td>20</td><td>20</td></tr>
<tr><td colspan="3">Faculty Requirements</td></tr>
<tr><td colspan="2">CM1401 Chemistry for Life Sciences [1]
LSM1102 Molecular Genetics [1]
MA1101R Linear Algebra I
SP1541 Exploring Science Communication through Popular Science [2]</td><td>16</td></tr>
<tr><td colspan="3">Major Requirements</td></tr>
<tr><td colspan="2">Level-1000 / 2000 Essential [1]</td><td rowspan="2">32 – 36</td></tr>
<tr><td>CS1010S ~~or CS1010FC~~ or CS1010X Programming Methodology [3]</td><td>4</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			~~CS1020E or CS1020 Data Structures And Algorithms I~~ CS2040 Data Structures and Algorithms	4	
			CS1231 Discrete Structures or MA1100 Fundamental Concepts of Mathematics	4	
			LSM1106 Molecular Cell Biology	4	
			MA1102R Calculus	4	
			CS2220 Introduction to Computational Biology [4] OR LSM2241 Introductory Bioinformatics	4	
			LSM2211 Metabolism and Regulation OR LSM2232 Genes and Genomes OR LSM2233 Cell Biology	4	
			Either ST2334 Probability and Statistics OR a combined ST2131 Probability and ST2132 Mathematical Statistics*	4 – 8	
			Level-3000 Essential		
			MA3259 Mathematical Methods In Genomics	4	8
			LSM3241 Genomic Data Analysis	4	
			Level-3000 Electives [~~3~~ 4] (Choose Four Modules) – [Any two modules from option A and any two modules from option B] Option A CS2102 Database System CS3103 Computer Networks Practice CS3225 Combinatorial Methods in Bioinformatics CS3230 Design and Analysis of Algorithms CS3240 Interaction Design CS3241 Computer Graphics CS3243 Introduction to Artificial Intelligence CS3244 Machine Learning Option B LSM3211 Fundamental Pharmacology LSM3223 Immunology LSM3225 Molecular Microbiology LSM3231 Protein Structure and Function		~~24~~ 16

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

LSM3232	Microbiology	
LSM3233	Developmental Biology	
LSM3243	Molecular Biophysics	
~~LSM3244~~	~~Molecular Biotechnology~~	
PC3267	Biophysics II [5]	
MA3233	Combinatorics and Graphs II	
ST3131	Regression Analysis	
ST3240	Multivariate Statistical Analysis	
ST3232	Design and analysis of experiments	
ST3233	Applied time series analysis	
ST3236 / MA3238	Stochastic Process 1	
ST3247	Simulation	
ST3248	Statistical Learning I	

Level-4000 Essential			
ZB4199	Honours Project in Computational Biology	12	20
ZB4171	Advanced Topics in Bioinformatics	4	
LSM4241	Functional Genomics	4	

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	12
CS4221	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	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

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 LSM4226 Infection and Immunity LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4242 Protein Engineering	
Option C MA4251/ ST4238 Stochastic Processes II PC4267 Biophysics III ST4231 Computer Intensive Statistical Methods ST4234 Bayesian Statistics ~~ST4235 Simulation~~ ~~ST4240 Data Mining~~ ST4242 Analysis of Longitudinal Data ST4248 Statistical Learning II	
Unrestricted Elective Modules [4]	32 – 36
Total	**160**

Note 1:
Modules are part of the lower division requirements for the Computational Biology Programme.
Note 2:
The following groups of students who are precluded from reading SP1541/ES1541:

- Students who are UTown residents and have read and passed the IEM, UTW and UWC modules
- Students who are RVRC residents and have read and passed ES1601 module
- Students who are in SPS and have read and passed the SP2171

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
Students who are in USP and have read and passed the UWC2101% modules
will have to read another module instead of SP1541 to fulfil 4 MCs of Faculty requirements, except for students in SPS who have read and passed SP2171 as SP2171 can be used to fulfil 4 MCs of Faculty Requirements.
Note 3:
CS1101S Programming Methodology (5 MCS) may be read as an alternative to CS1010S. This module is suitable for those with prior experience in Python. Do note that registration to this module is subject to host availability.

Note 3 4:
ZB3288 UROPS in Computational Biology can be taken in fulfilment of 4 MCs from any of the options in the level-3000 elective list.
Note 4 5:
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). In addition, as Computational Biology students already have stipulated Faculty requirements, they would read SP1541 as an Unrestricted Elective.
* 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.
<table>
<tr><th>Summary of Requirements</th><th>B.Sc. (Hons.)</th></tr>
<tr><td>University Requirements</td><td>20 MCs</td></tr>
<tr><td>Faculty Requirements</td><td>16 MCs</td></tr>
<tr><td>Major Requirements</td><td>88-92 MCs</td></tr>
<tr><td>Unrestricted Elective Modules</td><td>32-36 MCs</td></tr>
<tr><td>Total</td><td>160 MCs</td></tr>
</table>
</td></tr>
<tr><td>47.</td><td>29 Nov 2017</td><td>FoS</td><td>The Proposed Changes to the Data Analytics Second Major Requirements were approved via BUS Circular 8 of AY2017/18. Following amendments were made to the bulletins:

AY2017/18 Bulletin</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
Under 3.4.2.2 Second Major in Data Analytics http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/second-major-programmes/second-major-in-data-analytics/

To be awarded a B.Sc. with a second major in Data Analytics, candidates must satisfy the following:

<table>
<tr><th>Levels</th><th>Second Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>Level 1000(~~16~~ 10 – 12 MCs)</td><td>Pass

One of the following modules:
CS1010/CS1010E/CS1010J/CS1010S/CS1010X Programming Methodology
IT1007 Introduction to Programming with Python and C
~~CS1020/CS1020E Data Structures and Algorithms I~~
One of the following modules:
• MA1101R Linear Algebra I
• MA1311 Matrix Algebra
• MA1508E Linear Algebra for Engineering
• MA1513 Linear Algebra with Differential Equations (2 MCs) †
• ~~MA1506 Mathematics II~~
• ~~MA1508 Linear Algebra with Applications~~
One of the following modules:
• MA1102R Calculus
• MA1312 Calculus with Applications
• MA1505 Mathematics I
• MA1507 Advanced Calculus
• MA1511 Engineering Calculus (2 MCs) and MA1512 Differential Equations for Engineering (2 MCs)
• MA1521 Calculus for Computing</td><td>~~16~~
10–12</td></tr>
<tr><td>Level 2000(16 MCs)</td><td>Pass</td><td>~~32~~ 26–28</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

	~~CS2010 Data Structures and Algorithms II~~ CS2040 Data Structures and Algorithms ST2131/MA2216 Probability ST2132 Mathematical Statistics One of the following modules: • DSA2101 Essential Data Analytics Tools: Data Visualisation • DSA2102 Essential Data Analytics Tools: Numerical Computation	
Level 3000 and 4000 (~~16~~ 20–24 MCs)	Pass ST3131 Regression Analysis One of the following modules: • DSA3102 Essential Data Analytics Tools: Convex Optimisation* • ~~DSC3214~~ DBA3701 Introduction to Optimisation • MA3236 Nonlinear Programming* • MA3252 Linear and Network Optimisation One module from List I One module from List II One other module from List I or List II One additional module from List I or List II †	48 - 50

† Applicable only to students who use MA1513 Linear Algebra with Differential Equations (2 MCs) to fulfil the second major requirements.

List I^

DSA4211 High-Dimensional Statistical Analysis
DSA4212 Optimisation for Large-Scale Data-Driven Inference*

List II

CS3244 Machine Learning
ST3240 Multivariate Statistical Analysis
ST3247 Simulation
ST3248 Statistical Learning I
ST4248 Statistical Learning II

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>* Students may need to read additional modules outside the second major requirements to satisfy the pre-requisites of these modules.
^ (1) As part of the Data Science and Analytics programme, FoS is planning to co-develop modules on data analytics for functional areas such as business, healthcare and public policy making with other Faculties/Schools. These modules will be coded as DSA modules and added to List I. (2) Students who participate in credit-bearing full-time internships/industrial attachments/professional placements as part of their degree requirements may be approved to double-count up to 8 MCs into List I if their internships/industrial attachments/professional placements have substantial data-analytics content, provided the limit of 16 MCs of double-counting in primary and second major requirements is not exceeded.
This second major is not offered with the following primary majors and minors:
Primary Majors: Applied Mathematics, Computational Biology, Data Science and Analytics, Mathematics, Quantitative Finance, Statistics.
Minors: Financial Mathematics, Mathematics, Statistics.</td></tr>
<tr><td>48.</td><td>29 Nov 2017</td><td>FoS</td><td>The proposed changes to the Statistics Second Major and Minor requirements were approved via BUS Circular 8 of AY2017/18. The following amendments were made to the bulletins:

AY2017/18 Bulletin
Under 3.4.2.6 Second Major in Statistics http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/second-major-programmes/second-major-in-statistics/ , please make the following amendments:
To be awarded a B.Sc. with a second major in Statistics, candidates must satisfy the following:
<table>
<tr><th>Module Level</th><th>Second Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>Level-1000

(14 - 16 ~~– 17~~ MCs)</td><td>Pass

ST1131 Introduction to Statistics
or
ST1232 Statistics for Life Sciences

MA1101R Linear Algebra I
or
~~MA1506 Mathematics II~~</td><td>14 - 16</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
				~~or~~ ~~MA1508 Linear Algebra with Applications~~ MA1508E Linear Algebra for Engineering or MA1513 Linear Algebra with Differential Equations (2 MCs) ^ MA1102R Calculus or MA1505 Mathematics I or MA1507 Advanced Calculus or MA1511 Engineering Calculus (2 MCs) and MA1512 Differential Equations for Engineering (2 MCs) or MA1521 Calculus for Computing CS1010 Programming Methodology or CS1010E Programming Methodology or CS1010J Programming Methodology or CS1010S Programming Methodology ~~or~~ ~~CS1010FC Programming Methodology~~ or CS1010X Programming Methodology or IT1007 Introduction to Programming with Python and C	

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Level-2000 (16 - 17 MCs)	Pass ST2131/ MA2216 Probability ST2132 Mathematical Statistics ST2137 Computer Aided Data Analysis MA2311 Techniques in Advanced Calculus or MA2104 Multivariable Calculus or MA2108 Mathematical Analysis I or MA2108S Mathematical Analysis I (S)	30 ~~2~~ – 33
Level-3000 & Level-4000 (16 - 20 MCs)	Pass ST3131 Regression Analysis – Three other modules from ST32xx (except ST328x) or ST4xxx modules - One additional module from ST32xx (except ST328x) or ST4xxx modules ^	48 – 51 ~~49~~

^ Applicable only to students who use MA1513 Linear Algebra with Differential Equations (2 MCs) to fulfil the second major requirements.
This second major is not offered with a primary major in Statistics, or Data Science and Analytics, and minor in Statistics.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Students reading a primary major in Applied Mathematics/Mathematics/Quantitative Finance with a second major in Statistics should refer to the FAQ at https://www.stat.nus.edu.sg/index.php/current-students/undergraduate-programme/faq http://www.stat.nus.edu.sg/opencms/currentstudents/cs_ugradfaq.html#course.
49.	29 Nov 2017	FoS	Updates submitted by FoS (29 Nov 2017) The Proposed Changes to the Requirements for the Minor in Physics Programme have been approved via BUS Circular 8 of AY2017/18. The following amendments were made to the bulletins: AY2017/18 Bulletin Under 3.4.3.14 Minor in Physics http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-physics/ , kindly make the following changes: To be awarded a minor in Physics, a student must pass the following six modules: 1. Any one from the following: ○ PC1141 Introduction to Classical Mechanics ○ PC1142 Introduction to Thermodynamics and Optics ○ PC1143 Introduction to Electricity & Magnestism ○ PC1431 Physics IE or PC1431X Physics IE 2. Any one from the following: ○ PC1144 Introduction to Modern Physics ○ PC1432/PC1432X Physics IIE ○ PC2232 Physics for Electrical Engineers 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 ○ PC2134 Mathematical Methods in Physics I ○ PC2230 Thermodynamics and Statistical Mechanics ○ PC2193 Experimental Physics I ○ PC3130 Quantum Mechanics II ○ PC3193 Experimental Physics II ○ ALL PC32XX and PC42XX modules ○ PC3231 Electricity and Magnetism II ○ PC3232 Nuclear and Particle Physics

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			○ PC3233 Atomic and Molecular Physics I ○ PC3235 Solid State Physics I ○ PC3236 Computational Methods in Physics ○ PC3238 Fluid Dynamics ○ PC3243 Photonics ○ PC3246 Astrophysics I ○ PC3247 Modern Optics ○ PC3251 Nanophysics ○ PC3274 Mathematical Methods in Physics II ○ PC4130 Quantum Mechanics III ○ 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 General Relativity ○ PC4249 Astrophysics II ○ 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 Nanophysics) and second major in Physics.
50.	18 Dec 2017	FoS	NUS Bulletin 2017/18 - Updates submitted by FoS (18 Dec 2017) 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

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			minor programme, which have been approved via BUS Circular 9 of AY2017/18 (Changes for AY2017/18 to AY2013/14). The following amendments were made in the Bulletins: AY2017/18 Bulletin - Under 3.4.3.5 Minor in Financial Mathematics (http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-financial-mathematics/), kindly make the following amendments: AY2016/17 Bulletin – Under 3.4.3.5 Minor in Financial Mathematics (Bulletin Updates http://www.nus.edu.sg/registrar/info/nusbulletin/Bulletin-Updates-AY1617.pdf , 9. Changes to Minor in Financial Mathematics, dated 30 Aug 2017)), kindly 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 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

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			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 not awarded with the primary major in Applied Mathematics, Quantitative Finance, Mathematics, Data Science and Analytics, and second major in Mathematics, Data Analytics. For AY2015/16 Bulletin – Under 3.4.3.5 Minor in Financial Mathematics (Bulletin Updates http://www.nus.edu.sg/registrar/info/nusbulletin/Bulletin-Updates-AY1516.pdf , 16. Changes to Financial Mathematics minor, dated 23 Aug 2017), please note the following changes: For AY2014/15 Bulletin: Under 3.4.3.5 Minor in Financial Mathematics (Bulletin Updates, http://www.nus.edu.sg/registrar/info/nusbulletin/Bulletin-Updates-AY1415.pdf , 31. Changes to Financial Mathematics minor, dated 23 Aug 2017), please note the following changes: 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 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

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			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 not awarded with the primary major in Applied Mathematics, Quantitative Finance, Mathematics, and second major in Mathematics or Financial Mathematics
51.	18 Dec 2017	FoS	NUS Bulletin 2017/18 - Updates submitted by FoS (18 Dec 2017) The Revision to the Requirements for the Minor Programme in Aquatic Ecology was approved via BUS Circular 9 of AY2017/18. The following amendments were made to the bulletins: AY2017/18 Bulletin - Under 3.4.3.2 Minor in Aquatic Ecology http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-aquatic-ecology/ , please make the following amendments: AY2016/17 Bulletin – Under 3.4.3.2 Minor in Aquatic Ecology (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201617_FoS.pdf , pg 144), 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 Biodiversity~~ 1. LSM2251 Ecology and Environment 2. LSM3254 Ecology of Aquatic Environments 3. GE2229 Water and Environment 4. SP3203 Aquatic Ecology Research 5. Choose 2 from the following elective modules: [For students reading Life Sciences Major, please select at least one non-LSM prefixed module.]

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			○ 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 ○ ~~GEK1548 How the Ocean Works~~ ○ LSM2253 Applied Data Analysis in Ecology and Evolution ○ LSM2252 Biodiversity ○ LSM4257 Aquatic Vertebrate Diversity ○ ~~LSM3254 Ecology of Aquatic Environments~~ ○ ~~LSM3264 Environmental Biochemistry~~ ○ LSM4261 Marine Biology ○ LSM4264 Freshwater Biology ○ ~~LSM4266 Topics in Aquatic Biodiversity~~ This Minor is not awarded with a Bachelor of Environmental Studies (BES) degree from Cohort AY2016/17 and onwards. AY2015/16 Bulletin - Under 3.4.3.2 Minor in Aquatic Ecology (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201516_FoS.pdf, pg 71 to 72), please note the following changes: AY2014/15 Bulletin – Under 3.4.3.2 Minor in Aquatic Ecology (http://www.nus.edu.sg/registrar/info/nusbulletin/AY201415_FoS.pdf , pg 69 to 70), please note the following changes: 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

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			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 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}
52.	18 Dec 2107	FoS	NUS Bulletin 2017/18 - Updates submitted by FoS (18 Dec 2017) 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 (Changes for AY2017/18 to AY2013/14), 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.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			The following amendments were made in the Bulletin: AY2017/18 Bulletin Under 3.4.3.9 Minor in Mathematics (http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-mathematics/), the following amendments were made: To qualify for a minor in Mathematics, a student should pass at least 24 MCs from non-overlapping modules of the following type: 1. Pass at least 8 MCs from the following modules: a. MA1xxx modules except MA1301/MA1301X; or b. CS1231 2. Pass any two MA2xxx modules 3. Pass any two 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 Mathematics, Applied Mathematics, Quantitative Finance, Mathematics, Data Science and Analytics, and second major in Mathematics or Financial Mathematics or Data Analytics.
53.	20 Dec 2017	FoS	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. The following amendments were made to the bulletins: AY2017/18 Bulletin To be awarded a BSc with a second major in Mathematics, candidates must satisfy at least 48 MCs from non-overlapping modules of the following:

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Module Level	Second Major Requirements	Cumulative Major MCs
Level-1000 (16 – 18 MCs)	Pass MA1100 Fundamental Concepts of Mathematics or CS1231 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)	16 - 18

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

	MA1104/MA2104 Multivariable Calculus or MA2501 Differential Equations and Systems	
Level-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 ~~5~~
Level-3000 & Level-4000 (16 – 19 MCs)	Pass MA3110/ MA3110S Mathematical Analysis II MA3111/ MA3111S Complex Analysis I Two additional modules from List III, IV	48 – 56 ~~3~~

List II:

- All MA modules at Level-2000, except those coded MA23XX
- PC2130 Quantum Mechanics I
- PC2132 Classical Mechanics
- ST2132 Mathematical Statistics
- EC2101 Microeconomic Analysis I

List III:

- All MA modules at Level-3000, except MA3311 and MA3312
- BSE3703 Econometrics for Business I
- CS3230 Design & Analysis of Algorithms
- CS3234 Logic and Formal Systems

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			• DSA3102 Essential Data Analytics Tools: Convex Optimisation • EC3101 Microeconomic Analysis II • EC3303 Econometrics I • PC3130 Quantum Mechanics II • PC3236 Computational Methods in Physics • PC3238 Fluid Dynamics • ST3131 Regression Analysis • ST3236 Stochastic Processes I List IV: • All MA modules at Level-4000 or higher • CS4232 Theory of Computation • CS4234 Optimisation Algorithms • CS4236 Cryptography Theory and Practice • CS5230 Computational Complexity • CS5237 Computational Geometry and Applications • DSA4211 High-Dimensional Statistical Analysis • DSA4212 Optimisation for Large-Scale Data-Driven Inference • EC4101/EC4301 Microeconomic Analysis III • EC5104/EC5104R Mathematical Economics • PC4248 Relativity • PC4274 Mathematical Methods in Physics III • ST4238 Stochastic Processes II • ST4245 Statistical Methods for Finance This second major is not offered with a primary major in Applied Mathematics, Mathematics, Quantitative Finance or Data Science and Analytics, 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/undergraduates.aspx?f=UP-MA2.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
54.	20 Dec 2017	FoS	LSM2254 Fundamentals of Plant Biology, meant for cohort AY2015/16 and onwards, to fulfil the role of a LSM22xx elective for the completion of Life Sciences Major requirements, has been approved via BUS Circular 9 of AY2017/18. Thefollowing amendments were made to the bulletins: AY2017/18 Bulletin - Under 3.3.3.5 Life Sciences (http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/life-sciences/) Add LSM2254 Fundamentals of Plant Biology as a LSM22xx elective under the Level 2000 requirements in the table of requirements under: a) To be awarded a B.Sc. with a primary major in Life Sciences. b) To be awarded a B.Sc. (Hons.) with a primary major in Life Sciences or Life Sciences (with specialisation in Biomedical Science, Molecular and Cell Biology or Environmental Biology).
55.	12 Jan 2018	FoS	FoS would like to include the Computational Thinking requirement into the AY2017/18 bulletin. The following amendments in red were made in the following areas: a) FoS AY2017/18 Bulletin content page http://www.nus.edu.sg/nusbulletin/faculty-of-science/ [Kindly also make the changes to the numbering within the various sections themselves] 3 Undergraduate Education 3.1 Overview 3.2 Degrees Offered 3.3 Degree Requirements 3.3.1 Curriculum Structure and Graduation Requirements 3.3.1.1 Bachelor of Science 3.3.1.2 Bachelor of Science (Hons.) 3.3.1.3 Bachelor of Science (Pharmacy)/Bachelor of Science (Pharmacy) (Hons.) Requirements 3.3.1.4 University Scholars Programme (USP) Graduation

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
3.3.1.5 Major Prerequisites
3.3.1.6 Faculty Requirements
3.3.1.7 Computational Thinking Requirement (new section!)
3.3.1.78 SP1541/ES1541 Exploring Science Communication through Popular Science
3.3.1.89 English Skills (ES) Requirements
3.3.1.910 Honours Eligibility and Honours Projects
3.3.1.101 Degree Classification

b) For Section 3.3.1.7 Computational Thinking Requirement that is to be added, this is the content for the section itself:

Computational Thinking Requirement
To remain relevant in the workplace of tomorrow, undergraduates should acquire basic computational skills, i.e. computational thinking (CT).
For FoS Students admitted in AY2017/18 onwards, the options to fulfil the CT requirement, by the respective Major Programmes are described below:

<table>
<tr><th>Majors</th><th>Options to fulfil Computational Thinking requirement</th></tr>
<tr><td>Computational Biology,
Data Science & Analytics,
Mathematics & Applied Maths,
Quantitative Finance,
Statistics</td><td>These Majors will continue to acquire higher-order computational and programming skills in the form of CS1010S Programming Methodology (or its variants) (within the Major's core requirement)</td></tr>
<tr><td>Life Sciences
Physics</td><td>Option 1: COS2000 – Computational Thinking for Scientists
or
Option 2: CS1010S (or its variants) – Programming Methodology</td></tr>
<tr><td>Chemistry, Food Science & Technology</td><td>Option 1: COS2000 – Computational Thinking for Scientists
or
Option 2: CM3267 – Computational Thinking and Programming in Chemistry*
or</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Option 3: CS1010S (or its variants) – Programming Methodology</td></tr>
<tr><td>Pharmacy</td><td>It has been decided that the undergraduates for Cohort 2017/18 would be exempted from taking separate CT modules. Rather, the Pharmacy Department will work with the School of Computing to incorporate CT or elements of programming into the major requirements of Pharmacy.</td></tr>
<tr><td>Bachelor of Environmental Studies (BES)</td><td>All undergraduates (from FASS and FoS, in BES, inclusive of BES students in the UTCP or USP programme), will be required to do GET1031A.

BES students doing the UTCP at Residential College 4 (RC4) are exempted from GET1031A as the RC4 programme encourages explicit use of representing thinking, using computer models.</td></tr>
</table>

Notes
- For all FoS majors, the option to take “CS1010S (or its variants) – Programming Methodology” is open (even if it is not within your major programme requirements), and can be used to fulfil the CT requirement. However, do note that the availability of this module is subject to successful bidding.
- COS2000 will count as a module from the Computing Sciences subject group of the FoS Faculty requirements.
- *New elective module CM3267 will be finalised soon and is targeted to be offered with effect from Sem 2 of AY2018/19.

Special Programme in Science students

Students who have completed the Special Programme in Science (SPS)’s requirement, by successfully passing the following modules:

1. SP2171 Discovering Science,
2. SP2173 Atoms to Molecules,
3. SP2174 The Cell,</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			4. SP3172 Integrated Science Project, 5. SP3175 The Earth, and 6. SP3176 The Universe, are deemed to have fulfilled the CT requirement. A student who does not complete the SPS requirement by passing all 6 SPS modules, would need to ensure that he/she fulfils the CT requirement by reading a module that counts towards the CT requirement, according to the options to fulfil CT requirement for his/her major. Double Degree Programmes (DDP) Higher-order computational skills, such as coding or programming methodology, will be required for the following schools and faculties - Science, Business, Engineering, Design & Environment, and Computing. For FASS, basic skills in CT are required, and this is achieved via compulsory module, GET1031A. 1) For students doing DDP in Science and FASS, the CT requirement for FoS will prevail. 2) In the case of a student who is required to do higher-order CT (e.g., BComp (Hons) – BSc (Hons) Double Honours Programmes) in both degrees, the higher-order CT module which has been listed as a common requirement by both faculties, will apply. Otherwise, the Home Faculty's CT requirement should then take precedence. Double Majors (DMP) The same set of principles to apply – refer to DDP (1) and (2) above, if your 1st major is from FoS, and your 2nd major is from another Faculty. If both your majors are from FoS, as long as you have read a module fulfilling CT requirement in either one of your majors, you would be deemed to have fulfilled the CT requirement. Transfer cases (full credit transfer): 1) A student transferring out of FASS to FoS, who brings his or her grade obtained for GET1031A, should still fulfil the CT requirement stipulated by the new Home Faculty, FoS.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
2) A student transferring out of a School or Faculty which has higher-order CT requirement, may fulfil CT requirement with this grade and credit obtained. Nevertheless, if the new Home Faculty has another CT module being listed as a compulsory programme requirement, he or she must still fulfil the new Home Faculty's programme requirement. FoS students transferring to another Faculty should check with their new Home Faculty on how to fulfil the CT requirement.

c) The following addition in red were made in 3.3.1.6 Faculty Requirements

http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/faculty-requirements/

Table 2: Table of Subject Groups

<table>
<tr><th>Subject Group</th><th>Majors</th><th>Module Code Prefix</th></tr>
<tr><td rowspan="2">Computing Sciences</td><td>Computational Biology (ZB)</td><td rowspan="2">CS*, COS2000, IT1001*, IT1002*, IT1006*, QF, ZB</td></tr>
<tr><td>Quantitative Finance (QF)</td></tr>
<tr><td rowspan="6">Chemical Sciences</td><td>Chemistry (CM)</td><td rowspan="6">CM, FST, PR</td></tr>
<tr><td>Chemistry (Specialisation in Materials Chemistry) (CM)</td></tr>
<tr><td>Chemistry (Specialisation in Medicinal Chemistry) (CM)</td></tr>
<tr><td>Chemistry (Specialisation in Environment and Energy) (CM)</td></tr>
<tr><td>Food Science & Technology (FST)</td></tr>
<tr><td>Pharmacy (PR)</td></tr>
<tr><td rowspan="2">Life Sciences</td><td>Food Science & Technology (FST)</td><td rowspan="2">FST, LSM, PR</td></tr>
<tr><td>Life Sciences (LSM)</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
				Life Sciences (Specialisation in Biomedical Science) (LSM)	
				Life Sciences (Specialisation in Molecular & Cell Biology) (LSM)	
				Life Sciences (Specialisation in Environmental Biology) (LSM)	
				Pharmacy (PR)	
			Mathematical & Statistical Sciences	Applied Mathematics (MA)	CZ, DSA, MA, QF, ST
				Applied Mathematics (Specialisation in Mathematical Modelling and Data Analytics) (MA)	
				Applied Mathematics (Specialisation in Operations Research and Financial Mathematics) (MA)	
				Data Science and Analytics (DSA)	
				Mathematics (MA)	
				Quantitative Finance (QF)	
				Statistics (ST)	
				Statistics (with specialisation in Biostatistics) (ST)	
				Statistics (with specialisation in Finance and Business Statistics) (ST)	
			Physical Sciences	Physics (PC)	PC
				Physics (with specialisation in Astrophysics) (PC)	

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Physics (with specialisation in Nanophysics) (PC)</td><td></td></tr>
<tr><td>Multidisciplinary & Interdisciplinary Sciences</td><td>—</td><td>FMS12XXB, FMS12XXC, FMS12XXM, FMS12XXP, FMS12XXR, FMS12XXS, SP1202, SP1203, SP1541, SP2251, SP3201, SP3202, SP3203, SP3277</td></tr>
</table>
* Modules CSxxxx, IT1001, IT1002 and IT1006 are offered by the School of Computing but if read, may be counted towards Faculty requirements from the Computing Sciences Subject Group.
</td></tr>
<tr><td>56.</td><td>24 Jan 2018</td><td>FoS</td><td>
For the AY2017/18 Bulletin, the following amendments were shown in tracked changes under:

a) http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/bachelor-of-science/

3.3.1.1 Bachelor of Science
Home / NUS Bulletin AY2017/18 / Faculty of Science / Undergraduate Education / Degree Requirements / Curriculum Structure and Graduation Requirements / Bachelor of Science
To be awarded a Bachelor of Science Degree, students must have:
1. Satisfied the General Education Requirements comprising:
a. 20 MCs from General Education Modules (GEM)
2. Satisfied the Programme Requirements comprising:
a. 12 MCs of Faculty requirements (for B.Sc., except for students in Food Science and Technology major). Students in Food Science and Technology major must fulfill 16 MCs of Faculty requirements [please refer to Section 3.3.1.6 ~~F~~ for more details]
b. For all Science students (except Pharmacy, Environmental Studies students , students on special programmes like SPS, USP and UTown residential programme and students residing in RVRC)), SP1541 Exploring Science Communication through Popular Science is a compulsory Faculty requirement;
c. One set of major requirements.

3. Completed and passed a Computational Thinking module, according to the requirements. Please refer to Section 3.3.1.7 Computational Thinking Requirement.
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			4. Accumulated a minimum of 120 Modular Credits (MCs)* (of which no more than 60 MCs may come from Level-1000 modules; Polytechnic Diploma holders who are granted advanced placement credits should refer to Section 3.3.2.1~~, Para A~~ for more details); 5. Obtained a cumulative average point (CAP) of at least 2.00; 6. Passed the requisite English Skills module(s) by the fourth semester (only applicable to students who fail to meet the exemption criteria based on the Qualifying English Test (QET) results); and 7. Fulfilled all the above within a maximum candidature of four years unless under extenuating circumstances. Semesters spent on approved Leave of Absence (LOA) would be excluded from the period of candidature. b) http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/bachelor-of-science-hons/ 3.3.1.2 Bachelor of Science (Hons.) Home / NUS Bulletin AY2017/18 / Faculty of Science / Undergraduate Education / Degree Requirements / Curriculum Structure and Graduation Requirements / Bachelor of Science (Hons.) To be awarded a Bachelor of Science (Hons.) Degree, students must have: 1. Satisfied the General Education Requirements comprising: a. 20 MCs from General Education Modules (GEMs) 2. Satisfied the Programme Requirements comprising: a. 16 MCs of Faculty requirements [for B.Sc. (Hons.), except for students in Food Science and Technology major.] Students in Food Science and Technology major must fulfill 20 MCs of Faculty requirements [please refer to Section 3.3.1.6 ~~F~~ for more details] b. For all Science students (except Pharmacy and Environmental Studies students, students on special programmes like SPS, USP and UTown residential programme and students residing in RVRC) SP1541 Exploring Science Communication through Popular Science is a compulsory Faculty requirement; c. One set of major requirements. 3. Completed and passed a Computational Thinking module, according to the requirements. Please refer to Section 3.3.1.7 Computational Thinking Requirement. 4. Accumulated a minimum of 160 Modular Credits (MCs)* (of which no more than 60 MCs may come from Level-1000 modules; Polytechnic Diploma holders who are granted advanced placement credits should refer to Section 3.3.2.1~~, Para A~~ for more details);

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>5. Completed a mandatory year-long honours project module or the stated alternatives to the honours project module;
6. Obtained a cumulative average point (CAP) of at least 3.00;
7. Passed the requisite English Skills module(s) by the fourth semester (only applicable to students who fail to meet the exemption criteria based on the Qualifying English Test (QET) results);
8. Any other requirements as stipulated by the Faculty for graduation; and
9. Fulfilled all the above within a maximum candidature of five years (applicable to students completing single and double majors) where semesters spent on Leave of Absence (LOA) would be excluded from the period of candidature.</td></tr>
<tr><td>57.</td><td>14 Feb 2018</td><td>FoS</td><td>The FST proposal to increase the MCs of FST3181 from 8 to 12MCs, of which 4MC would fulfil Faculty requirements, and 8MC would go towards UE, for cohorts AY2015/16 and after, has been approved via BUS Circular 10 of AY2017/18.
The FoS Faculty Requirements with respect to FST majors from AY2015/16 cohort and after, and the information from the “Summary of Requirements” for the B.Sc./B.Sc. (Hons.) Programme Requirements for FST majors, need to be amended.
Kindly help to make the following amendments to the:
AY2017/18 Bulletin
a) Under 3.3.1.6 Faculty Requirements http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/faculty-requirements/ , kindly help to make the amendments indicated in red:
Table 1: Table of Faculty Requirements for various Programmes
<table>
<tr><th>Programme</th><th>Faculty Requirements</th></tr>
<tr><td>B.Sc.
(for Food Science and Technology major, there is a separate set of requirements – refer below to B.Sc. (For FST major)</td><td>12 MCs from three distinct subject groups outside the group(s) under which the major falls.</td></tr>
<tr><td>B.Sc.(Hons.)
(for Food Science and Technology major, there is a separate set of</td><td>16 MCs from at least three distinct subject groups outside the group(s) under which the major falls (where 4 MCs may come from the subject group under which the major falls, but not bearing the prefix of the major).</td></tr>
</table>
</td></tr>
</table>

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requirements – refer below to B.Sc.(Hons.) (For FST major)	
B.Sc. (For FST major)	4 MCs from Professional Placement Programme, and 8 MCs from two distinct subject groups outside the subject group(s) under which the major falls. ~~8 MCs from Professional Placement Programme, and~~ ~~8 MCs from two distinct subject groups outside the subject group(s) under which the major falls.~~
B.Sc.(Hons.) (For FST major)	4 MCs from Professional Placement Programme, and 12 MCs from at least two distinct subject groups outside the group(s) under which the major falls (where 4 MCs may come from the subject group under which the major falls, but not bearing the prefix of the major.) ~~8 MCs from Professional Placement Programme, and~~ ~~12 MCs from at least two distinct subject groups outside the group(s) under which the major falls (where 4 MCs may come from the subject group under which the major falls, but not bearing the prefix of the major).~~
B.Sc. (Pharm.)/ B.Sc. (Pharm.) (Hons.)	Please refer to section 3.3.4

b) Under 3.3.3.3 Food Science and Technology http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-sciencebachelor-of-science-hons-programme-requirements-b-sc-b-sc-hons/food-science-and-technology/ , kindly help to make the amendments indicated in red:

Summary of Requirements	B.Sc. (FST)	B.Sc. Hons. (FST)
University Requirements	20 MCs	20 MCs
Faculty Requirements	8 ~~12~~ MCs†	8 ~~12~~ MCs ††
Major Requirements	64 MCs	96 MCs
Unrestricted Elective Modules	28 ~~24~~ MCs†††	36 ~~32~~ MCs†††
TOTAL	120 MCs	160 MCs

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			† 16 12 MCs of Faculty requirements are partially fulfilled through 4 MCs from ST1232 within the major. The remaining 12 8 MCs are fulfilled through (i) 8 4 MCs from FST3181 Professional Placement; and (ii) 4 MCs from any one of the following subject groups: Computing Sciences, Physical Sciences, Multidisciplinary & Interdisciplinary Sciences. †† 20 16 MCs of Faculty requirements are partially fulfilled through 8 MCs from ST1232 and CM/LSM modules within the major. The remaining 12 8 MCs are fulfilled through (i) 8 4 MCs from FST3181 Professional Placement; and (ii) 4 MCs from any one of the following subject groups: Computing Sciences, Physical Sciences, Multidisciplinary & Interdisciplinary ††† The remaining 8MCs from FST3181 (after fulfilling 4MCs of Faculty Requirements) would fulfil the Unrestricted Electives requirements.
58.	23 Feb 2018	FoS	The proposed changes to the requirements for the Minor in Physics Programme to take into account new module PC2020 Electromagnetism for Electrical Engineers, was approved via BUS Circular 12 of AY2017/18. The Bulletins from AY2015/16 to AY2017/18, will need to be amended. AY2017/18 Bulletin Under 3.4.3.14 Minor in Physics http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-physics/ , kindly make the following amendments: To be awarded a minor in Physics, a student must pass the following six modules: 1. Any one from the following: ○ PC1141 Introduction to Classical Mechanics ○ PC1142 Introduction to Thermodynamics and Optics ○ PC1143 Introduction to Electricity & Magnestism ○ PC1431 Physics IE or PC1431X Physics IE 2. Any one from the following: ○ PC1144 Introduction to Modern Physics ○ PC1432/PC1432X Physics IIE ○ PC2232 Physics for Electrical Engineers/PC2020 Electromagnetism for Electrical Engineers
59.	12 Jul 2017	LKYSPP	http://www.nus.edu.sg/nusbulletin/lee-kuan-yew-school-of-public-policy/ is updated to include the new Master in International Affairs under 3.2.5 and number PhD as 3.2.6.

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Please include this link http://www.nus.edu.sg/nusbulletin/lee-kuan-yew-school-of-public-policy/graduate-education/degree-requirements/master-in-international-affairs/. The write-up in this link is as follows: Admission Policy The School seeks candidates who are academically strong and who are interested in careers in diplomacy, consulting, research, and in working in non-governmental organisations, international/regional organizations, and think tanks. Candidates should be highly motivated and have keen interest in Asian perspectives on international affairs. The MIA Candidate The Admissions Committee selects candidates for this Master's programme using a variety of criteria. Applicants will also be evaluated on the depth and quality of their experience, as demonstrated by work history (if any), references, and the applicant's written analysis of past employment or other relevant experience. The applicant should be motivated, outward-looking, and open to new ideas. To be considered for the Master in International Affairs programme, applicants must have: i. A good NUS honours degree (second class and above) or equivalent (e.g., a four-year Bachelors degree with at least an average grade of B or equivalent), ii. Valid GRE/ GMAT/ LSAT results Other qualifications and experience may be accepted subject to approval by the NUS Board of Graduate Studies. Requirements The minimum candidature period for the MIA degree is 2 years and the maximum is 4 years. Within that time, students must complete 64 modular credits (MCs) and the LKY School Course. The 64 MCs comprise 9 core modules, 5 electives and a Master Thesis or Capstone Project (based on 2-month internship experience). The electives may be count towards a specialisation (20 MCs). The core modules (36 MCs) are: • International Relations: Theory and Practice • International Security – Concepts, Issues and Policies • International Political Economy

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			• Research Methods in International Affairs • Foreign Policy Analysis • International Economic Development • International Conflict Analysis and Resolution • Global Governance in a Changing World • Geopolitics of the Asia Pacific Students may choose to specialize in one of the following: • Politics, International Relations, and Law • International Economics and Development • International Public Management and Leadership • Energy, Environment, and Water • International Security • Regional Studies: The Asia Pacific
60.	13 Jul 2017	LKYSPP	MPP Revised Curriculum http://www.nus.edu.sg/nusbulletin/lee-kuan-yew-school-of-public-policy/graduate-education/degree-requirements/master-in-public-policy/ To replace the entire section on Requirements: The minimum candidature period for the MPP is 18 months and the maximum is three years. Within that time, a student must earn at least 64 graduate-level Modular Credits (MCs) by completing at least 15 modules, comprising 8 common curriculum (28 MCs), five modules in a chosen specialisation (20 MCs), free electives (16 MCs) and The LKY School Course. Most MPP students read four modules per semester and complete the requirements in four semesters spanning two years. Students may apply to read electives (up to 12 MCs) taught in other programmes within NUS. The MPP programme is full time and fully taught in English. The curriculum will consist of: 1. Common Curriculum (28 MCs) that all MPP students must take in their first year (in the 2-year MPP programme) 2. Modules in a chosen Specialization (20 MCs) 3. Free Electives (16 MCs)

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			1. The Common Curriculum focuses on imparting practical skills, disciplinary knowledge, and interdisciplinary competencies that the School believes to be necessary for the kind of work done by public policy practitioners, researchers, and public managers and leaders. The modules in the Common Curriculum are: a. PP5401 Policy Challenges (4MCs): This module is designed to get students to think in a practical, problem-oriented, and multidisciplinary way through critical lenses and analytical tools available in the disciplines of Public Management and Leadership, Political Science and International Relations, and Economics, all pillars of a traditional Public Policy education. b. PP5402 Policy Process and Institutions (2 MCs, half a semester): The module is about approaches, institutions and processes in public policy. Specifically, it examines: definition and approaches to the analysis and practice of public policy; the political economic context of public policy; and the process of framing, making, and evaluating public policy. The objective is to build students' capability to conceptualise policy problems, devise strategies for addressing them, and comprehend policy documents. c. PP5110A Policy Analysis Exercise (4MCs, year-long): To obtain direct practical experience, MPP students work in diverse teams to undertake a public policy or management study for a client in the public, private, or not-for-profit sectors. d. PP5403 Economic Foundations for Public Policy (4MCs, semester-long): As Economics is an essential component of a Public Policy education, all students will be expected to graduate with at least a basic understanding of the key concepts and theories associated with microeconomics and macroeconomics. The main objective of this module is to understand foundational economics concepts and principles and their application to public policy. e. PP5405 Public Administration and Politics, a half-semester module worth 2 MCs, covers the key foundational topics of public administration and politics, such as the role of government; public and private sector relations and dynamics; political-administrative relations; collaboration and networks;

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			performance management; stakeholder management; and values, ethics, and anti-corruption strategies. It will provide students with knowledge, tools, and best practices of thinking about these administrative, political and managerial problems necessary to effectively continue their studies. f. PP5406 Quantitative Research Methods for Public Policy 1 (4 MCs, semester-long) trains students to be competent users and producers of quantitative evidence for policy analysis, this module will equip students with foundational quantitative analytic skills. The focus is on basic concepts of multiple regression analysis and its applications to real-world policy problems. Exercises through textbook examples, case studies, and group projects will enable students to identify the strengths and weaknesses of the method. PP5407, provided in sequence in the second semester, will provide students with more in-depth knowledge and skills required to understand and conduct policy evaluation. g. PP5407 Quantitative Research Methods for Public Policy 2 (4 MCs, semester-long) teaches Policy evaluation which is critical in helping to decide whether to expand, modify, or terminate a program or policy. The objective of this module is to provide students with the knowledge and skills required to understand and conduct policy evaluation. The module will build on the foundational analytical skills taught in PP5406. The focus is on rigorous quantitative evaluation tools. These will be taught using case studies and datasets that will allow students to identify the strengths and weaknesses of these methods and learn how to apply them to a policy problem of their choice. h. PP5408 Qualitative Research Methods for Public Policy (4 MCs, semester-long) explore the question of how qualitative research methods can be used to answer questions about public policy development and outcomes and how concerns about objectivity and representativeness can be overcome. This course introduces students to the conceptual foundations of qualitative research in the social sciences. It covers a wide range of techniques for conducting research with policy makers

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			and the public, and on country cases. The course will prepare students to consume and conduct qualitative research by combining both theoretical and procedural understanding. i. PP5010 The LKY School Course (0 MC, semester-long) comprising of a series of lectures on public policy innovations in Singapore and elsewhere, against a broad background of Asia's development trajectory. The module will provide students with broad appreciation of the philosophy and principles that inform governance and public policy. Notably, it will explore specific public policy innovations in Singapore, like housing and healthcare, and analyse thinking behind the formulation and implementations of such policies. 2. Specializations (20MCs): The Specialization component of the curriculum is where students will acquire depth and sophistication in their selected areas of policy expertise. To graduate with a Specialization, students will have to pass at least 5 modules listed in that Specialization. Students may opt not to graduate with a Specialization. The following Specializations will be offered: a. Economic Policy Analysis b. Politics and International Affairs c. Urban Policy 3. Free Electives: In addition to the Common and Specialization modules, students can choose to read any 4 electives as their Free Elective modules, either in their chosen Specialization or from other Specialization lists. MPA Revised Curriculum http://www.nus.edu.sg/nusbulletin/lee-kuan-yew-school-of-public-policy/graduate-education/degree-requirements/master-in-public-administration/ To replace the entire section on Requirements In this 1-year degree programme, students are required to read 40 modular credits in order to graduate. The MPA curriculum consists of: 1. A Common Curriculum (12 MCs) 2. Governance Study Conference (4 MCs)

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			3. The LKY School Course (0 MC) 4. Electives from the MPP Public Management and Leadership Specialization (2 modules, 8 MCs). 5. Free Electives (4 modules, 16 MCs): Students can choose to read any 4 available electives as their 'free elective' modules. 1. The modules in the Common Curriculum are: a. PP5801 Economic Analysis (4 MCs, Semester 1): Modern public policy experts need a solid grounding in Economics to be able to craft policies that take into account the economic factors that affect nearly all aspects of policy making. The first half of this course introduces the principles of microeconomics and applications are introduced via cases on externalities, taxation and public goods, regulation and competition policy, and trade policy. The second half deals with the tools of macroeconomic policy. Topics include macroeconomic indicators, exchange rate determination, inflation, policies for economic growth and stabilization. b. PP5802 Policy Analysis (4 MCs, Semester 2): Public sector managers are frequently confronted with decisions about whether or not to initiate, continue, modify, or terminate policies or programmes, and the knowledge and skills in policy analysis and programme evaluation are essential for them to make intelligent choices. The module will cover important considerations in conducting policy analysis and evaluation, such as identifying policy problems, establishing criteria, assessing policy alternatives, choosing among policies, and evaluating policy impacts. c. PP5803 Public Management (4 MCs, Semester 2): Public managers are answerable to various groups of people including those within hierarchical structures, political parties and politicians, citizens and civil society groups, and international actors and organizations. Also, public managers are often caught in policy

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			dilemmas and are tasked to carry out policy promises in very challenging contexts. This course aims to introduce students to key concepts in the discipline of public administration. 2. PP5804 The Governance Study Project (GSP, 4 MCs, Semester 1 + 2 + Special Term) is a year-long team-based project. Consisting of a study trip at the end of the first semester, a seminar, and a final conference at the end of the special term, the GSP connects the beginning to the end of the degree programme, requiring students to put to use the knowledge and skills learnt in each module. Through projects that are real public problems, students will acquire skills related to analysis of complex managerial problems, basic research, and writing and other presentational modes. 3. PP5010 The LKY School Course (0 MC, semester-long) comprising of a series of lectures on public policy innovations in Singapore and elsewhere, against a broad background of Asia's development trajectory. The module will provide students with broad appreciation of the philosophy and principles that inform governance and public policy. Notably, it will explore specific public policy innovations in Singapore, like housing and healthcare, and analyse thinking behind the formulation and implementations of such policies. 4. Electives from the MPP Public Management and Leadership Specialization (2 modules, 8 MCs). 5. Free Electives (4 modules, 16 MCs) In addition to the Common Curriculum, students can choose to read any 4 electives as their Free Elective modules in the Specialization lists.
61.	3 Apr 2018	Yale-NUS	**Yale-NUS Bulletin Faculty Contact submitted some updates to the NUS Bulletin 2017/2018 and the updates are highlighted in red as follows:** **http://www.nus.edu.sg/nusbulletin/yale-nus-college/**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Yale-NUS College Home / NUS Bulletin AY2017/18 / Yale-NUS College 1 The Yale-NUS College and Liberal Arts Education 2 Key Contact Information 3 The Learning Experience 3.1 Common Curriculum 3.2 Majors 3.3 Degrees Offered 3.3.1 Double Degree with NUS Law 3.3.2 Concurrent Degree with Yale School of Forestry and Environmental Studies 3.3.3 MBA with Yale School of Management 3.3.4 Master of Public Policy with the Lee Kuan Yew School of Public Policy 3.3.5 Concurrent Degree with Yale School of Public Health 3.3.6 MD, PhD, MD/PhD Programmes at Duke-NUS Medical School **The above updates/corrections will ensure that it is in line with the listing of 3.3.3 to 3.3.6 found in the section 3.3 'Degrees Offered' at:** **http://www.nus.edu.sg/nusbulletin/yale-nus-college/the-learning-experience/degrees-offered/**
62.	25 May 2018	YSTCM	3.1 BACHELOR OF MUSIC (HONOURS) DEGREE PROGRAMME

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			All full-time Conservatory students must carry a minimum workload of 18 modular credits (MC) per semester. Students admitted to the Bachelor of Music (Honours) degree programme must complete Music Modules and Non-Music Modules, and are required to earn a minimum of 160 MCs in order to graduate. 3.1.1 Curriculum Overall Outline for Violin, Viola and Cello Majors I. **Major Requirements** **(80 MC)** Applied Major Studies (8 modules, 1 per semester) (52 MC) **Ensembles/Class Activities** **(28 MC)** Large Ensemble (8 MC) Chamber Music - 3 semesters x 4 MC (12 MC) String Pedagogy -1 semester x 4 MC (Year 3 SEM 2) (4 MC) Contemporary Music Performance - 1 semester x 4 MC (4 MC) II. **Faculty Requirements** **(36 MC)** Introduction to Musical Concepts & Materials (4 MC) Compositional Engagement Modules (12 MC) (3 modules, 1 per semester in semesters 2-4) Foundations for Musical Discovery (4 MC) Contextual Engagement Module (4 MC) Introduction to Professional Integration (4 MC) Leading and Guiding Through Music (4 MC) Musical Pathways (4 MC) III. **University Requirements** **(20 MC)** General Education Modules (5 modules from GER, GEQ, GEH, GET, GES) IV. **Unrestricted Electives** **(24 MC)** V **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance)

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Ensemble Activities (as required by the Ensembles & Professional Development Office) Important Notes for Various Student Cohorts: For AY 2015/2016 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **28 MCs.** • Students matriculated from AY 2015/2016 are to note that for the 5 pillars of GE modules, you do not have to follow strictly the exact modules for the General Education Modules (5 modules from GER, GEQ, GEH, GET and GES) Instead, you just need to take a GES module, a GET and a GEH module which is compulsory. For the 2 remaining GE modules, you can either take two more GET modules, 2 more GEH modules, OR 1 GET module and 1 GEH module. For AY 2016/2017 cohort: • Students matriculated in AY 2016/2017 need to take a total of Unrestricted Electives worth a total number of **26 MCs**. 3.1.1.1 Curriculum Breakdown for String Majors (Violin, Viola, Cello) by Semester Year 1, Sem 1 Major Study (M) 6 Class Activities relating to Major Study (M) 2 Introduction to Musical Concepts & Materials (F) 4 Foundations for Musical Discovery (F) 4 General Education Module (U) 4 TOTAL 20 Year 1, Sem 2 Major Study (M) 6 Class Activities relating to Major Study (M) 6 Introduction to Professional Integration (F) 4 Compositional Engagement Module (F) 4 General Education Module (U) 4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			TOTAL 24 Year 2, Sem 1 Major Study (M) 6 Class Activities relating to Major Study (M) 2-6 Compositional Engagement Module (F) 4 Contextual Engagement Module (F) 4 General Education Module (U) 4 TOTAL 20-24 Year 2, Sem 2 Major Study (M) 6 Class Activities relating to Major Study (M) 2-6 Compositional Engagement Module (F) 4 Leading and Guiding Through Music (F) 4 General Education Module (U) 4 TOTAL 20-24 Year 3, Sem 1 Junior Recital (M) 6 Class Activities relating to Major Study (M) 2-6 Musical Pathways (F) 4 General Education Module (U) 4 Unrestricted Elective (U) 4 TOTAL 20-24 Year 3, Sem 2 Major Study (M) 6 Class Activities relating to Major Study (M) 4-8 Unrestricted Elective (U) 4 Unrestricted Elective (U) 4 TOTAL 18-24 Year 4, Sem 1 Major Study (M) 6 Class Activities relating to Major Study (M) 2-6 Unrestricted Elective (F) 4 Unrestricted Elective (M) 4 TOTAL 16-20

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Year 4, Sem 2 Senior Recital (M) 10 Unrestricted Elective (F) 4 TOTAL 14 3.1.2 Curriculum Overall Outline for Brass, Woodwinds, Double Bass, Harp and Percussion Majors I. **Major Requirements** **(72 MC)** Applied Major Studies (8 modules, 1 per semester) (52 MC) **Ensembles/Class Activities** **(20 MC)** Large Ensemble (4 MC) Chamber Music - 3 semesters x 4 MC (8 MC) Orchestral Pedagogy -1 semester x 4 MC (Year 3 SEM 2) (4 MC) Contemporary Music Performance - 1 semester x 4 MC (4 MC) II. **Faculty Requirements** **(36 MC)** Introduction to Musical Concepts & Materials (4 MC) Compositional Engagement Modules (12 MC) (3 modules, 1 per semester in semesters 2-4) Foundations for Musical Discovery (4 MC) Contextual Engagement Module (4 MC) Introduction to Professional Integration (4 MC) Leading and Guiding Through Music (4 MC) Musical Pathways (4 MC) III. **University Requirements** **(20 MC)** General Education Modules (5 modules from GER, GEQ, GEH, GET, GES) IV. **Unrestricted Electives** **(32 MC)** IV. **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance)

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Ensemble Activities (as required by the Ensembles & Professional Development Office) Important Notes for Various Student Cohorts: For AY 2015/2016 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **36 MCs.** (These modules include First Year Brass Class, OBC, ACOR and 2 large ensemble modules worth a total of 14 MCs) • Students matriculated from AY 2015/2016 are to note that for the 5 pillars of GE modules, you do not have to follow strictly the exact modules for the General Education Modules (5 modules from GER, GEQ, GEH, GET and GES) Instead, you just need to take a GES module, a GET and a GEH module which is compulsory. For the 2 remaining GE modules, you can either take two more GET modules, 2 more GEH modules, OR 1 GET module and 1 GEH module. For AY 2016/2017 cohort: • Students matriculated in AY 2016/2017 need to take a total of Unrestricted Electives worth a total number of **34 MCs.** (These UE modules include First Year Brass Class/First Year Woodwinds Class/Basic Mechanics of Percussion/Orchestral Repertoire modules worth a total of 8 MCs) For AY 2017/2018 cohort: • Students matriculated in AY 2017/2018 need to take a total of Unrestricted Electives worth a total number of **32 MCs**. (These UE modules include First Year Brass Class/First Year Woodwinds Class/Basic Mechanics of Percussion modules worth a total of 4 MCs) 3.1.2.2 Curriculum Breakdown for Woodwinds, Brass, Double Bass, Harp and Percussion Majors by Semester Year 1, Sem 1 Major Study (M) 6 Introduction to Professional Integration (F) 2 Introduction to Musical Concepts & Materials (F) 4 Foundations for Musical Discovery (F) 4 General Education Module (U) 4 TOTAL 20

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Year 1, Sem 2	Major Study (M)	6
	Introduction to Professional Integration (F)	2
	Compositional Engagement Module (F)	4
	General Education Module (U)	4
	Unrestricted Elective	4
		TOTAL 20
Year 2, Sem 1	Major Study (M)	6
	Class Activities relating to Major Study (M)	2-6
	Compositional Engagement Module (F)	4
	Contextual Engagement Module (F)	4
	General Education Module (U)	4
		TOTAL 20-24
Year 2, Sem 2	Major Study (M)	6
	Class Activities relating to Major Study (M)	2-6
	Compositional Engagement Module (F)	4
	Leading and Guiding Through Music (F)	4
	General Education Module (U)	4
		TOTAL 20-24
Year 3, Sem 1	Junior Recital (M)	6
	Class Activities relating to Major Study (M)	4-8
	Musical Pathways (F)	4
	General Education Module (U)	4
	Unrestricted Elective	4
		TOTAL 24-28
Year 3, Sem 2	Major Study (M)	6
	Class Activities relating to Major Study (M)	6-10
	Unrestricted Elective	4
		TOTAL 16-20

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Year 4, Sem 1 Major Study (M) 6
Class Activities relating to Major Study (M) 2-6
Unrestricted Elective 4
Unrestricted Elective 4
TOTAL 16-20

Year 4, Sem 2 Senior Recital (M) 10
Unrestricted Elective 4
Unrestricted Elective 4

TOTAL 18

3.1.3 Curriculum Outline for Voice Majors

I. **Major Requirements** **(84 MC)**
Applied Major Studies (8 modules, 1 per semester) (40 MC)
Major Study Related (15 modules) (44 MC)

II. **Faculty Requirements** **(36 MC)**
Introduction to Musical Concepts & Materials (4 MC)
Compositional Engagement Modules (12 MC)
(3 modules, 1 per semester in semesters 2-4)
Foundations for Musical Discovery (4 MC)
Contextual Engagement Module (4 MC)
Introduction to Professional Integration (4 MC)
Leading and Guiding Through Music (4 MC)
Musical Pathways (4 MC)

III. **University Requirements** **(20 MC)**
General Education Modules (5 modules from GER, GEQ, GEH, GET, GES) (20 MC)

IV. **Unrestricted Electives** **(20 MC)**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			V. **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance) Ensemble Activities (as required by the Ensembles & Professional Development Office) Important Notes for Various Student Cohorts: For AY 2015/2016 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **24 MCs.** • Students matriculated from AY 2015/2016 are to note that for the 5 pillars of GE modules, you do not have to follow strictly the exact modules for the General Education Modules (5 modules from GER, GEQ, GEH, GET and GES) Instead, you just need to take a GES module, a GET and a GEH module which is compulsory. For the 2 remaining GE modules, you can either take two more GET modules, 2 more GEH modules, OR 1 GET module and 1 GEH module. For AY 2016/2017 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **22 MCs**. 3.1.3.1 Curriculum Breakdown for Voice Majors Year 1, Sem 1 Applied Voice (M) 4 Italian 1 (M) 4 Diction for Singers 1 (M) 2 Chamber Singers 1 (M) 2 Introduction to Musical Concepts & Materials (F) 4 Foundations for Musical Discovery (F) 4 TOTAL 20 Year 1, Sem 2 Applied Voice (M) 4 Italian 2 (M) 4 Diction for Singers 2 (M) 2 Chamber Singers 2 (M) 2

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Introduction to Professional Integration (F) 4 Compositional Engagement Module (F) 4 General Education Module (U) 4 TOTAL 24 Year 2, Sem 1 Applied Voice (M) 4 German or French 1 (M) 4 Chamber Singers 3 (M) 2 Compositional Engagement Module (F) 4 Contextual Engagement Module (F) 4 General Education Module (U) 4 TOTAL 22 Year 2, Sem 2 Applied Voice (M) 4 German or French 2 (M) 4 Chamber Singers 4 (M) 2 Compositional Engagement Module (F) 4 Leading and Guiding Through Music (F) 4 General Education Module (U) 4 TOTAL 22 Year 3, Sem 1 Applied Voice (M) 4 German or French 1 (M) 4 Voice Literature 1 (M) 2 Musical Pathways (F) 4 General Education Module (U) 4 General Education Module (U) 4 TOTAL 22 Year 3, Sem 2 Junior Recital (M) 6 German or French 2 (M) 4 Voice Literature 2 (M) 2 Unrestricted Elective (U) 4 Unrestricted Elective (U) 4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			TOTAL 20 Year 4, Sem 1 Applied Voice (M) 4 Vocal Pedagogy (M) 4 Unrestricted Elective (U) 4 Unrestricted Elective (F) 4 TOTAL 16 Year 4, Sem 2 Senior Recital (M) 10 Unrestricted Elective (U) 4 TOTAL 14 3.1.4 Curriculum Outline for Composition Majors I. **Major Requirements** **(88 MC)** Major Studies (8 modules, 1 per semester) (48 MC) Area Electives related to Major* (28 MC) Additional Compulsory Modules (12 MC) (Music and Machines (2MC), Music and Computing (2MC) Compositional Discourse (4MC), Orchestration (4MC) II. **Faculty Requirements** **(36 MC)** Introduction to Musical Concepts & Materials (4 MC) Compositional Engagement Modules (12 MC) (3 modules, 1 per semester in semesters 2-4. Texture and Timbre is a compulsory compositional engagement module for comp majors) Foundations for Musical Discovery (4 MC) Contextual Engagement Module (4 MC) Introduction to Professional Integration (4 MC) Leading and Guiding Through Music (4 MC) Musical Pathways (4 MC) III. **University Requirements** **(20 MC)** General Education Modules (5 modules from GER, GEQ,

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			GEH, GET, GES) (20 MC) IV. **Unrestricted Electives** **(16 MC)** V. **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance) Ensemble Activities (as required by the Ensembles & Professional Development Office) Area Elective Modules: Students must take at least one of the following contemporary music analysis modules: 1) Early Twentieth Century Music 2) Modern Music Students must take at least one of the following additional orchestration modules: 1) Advanced Orchestration 2) Symphonic Band Arranging 3) Choral Composition 4) Chinese Orchestra Arranging Otherwise, students may choose freely from electives from a basket of composition-focused modules, electronic and computer music modules, ensembles (eg, Opus Novus, Chamber Singers, Conservatory Orchestra) or instrumental study (Applied Secondary Study) Students are to note that only a maximum of 6MCs from the ensembles or instrumental study basket of studies can count towards major study requirements. Important Notes for Various Student Cohorts: For AY 2015/2016 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **20 MCs.**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			• Students matriculated from AY 2015/2016 are to note that for the 5 pillars of GE modules, you do not have to follow strictly the exact modules for the General Education Modules (5 modules from GER, GEQ, GEH, GET and GES) Instead, you just need to take a GES module, a GET and a GEH module which is compulsory. For the 2 remaining GE modules, you can either take two more GET modules, 2 more GEH modules, OR 1 GET module and 1 GEH module. For AY 2016/2017 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **18 MCs.** 3.1.4.1 Curriculum Breakdown for Composition Majors by Semester Year 1, Sem 1 Major Study (M) 4 Music and Machines (M) 2 Introduction to Musical Concepts & Materials (F) 4 Foundations for Musical Discovery (F) 4 General Education Module (U) 4 TOTAL 18 Year 1, Sem 2 Major Study (M) 6 Music and Computing (M) 2 Introduction to Professional Integration (F) 2 Compositional Engagement Module (F) 4 General Education Module (U) 4 TOTAL 18 Year 2, Sem 1 Major Study (M) 6 Analysis and Composition Core Elective (M) 4 Contextual Engagement Module (F) 4 General Education Module (U) 4 Leading and Guiding Through Music 4 TOTAL 22

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)

Year 2, Sem 2	Major Study (M)	6
	Composition Major Elective (M)	2
	Texture and Timbre (F)	4
	Compositional Discourse (F)	4
	General Education Module (U)	4
	TOTAL	20
Year 3, Sem 1	Major Study (M)	6
	Orchestration (M)	4
	Musical Pathways (F)	4
	General Education Module (U)	4
	Composition Major Elective (M)	4
	TOTAL	22
Year 3, Sem 2	Major Study (M)	6
	Composition Major Elective (M)	8
	Unrestricted Elective (U)	4
	Unrestricted Elective (U)	4
	TOTAL	22
Year 4, Sem 1	Senior Year Project Prep (M)	8
	Composition Major Elective (M)	8
	Unrestricted Elective (F)	4
	Unrestricted Elective (U)	4
	TOTAL	24
Year 4, Sem 2	Senior Year Project (M)	6
	Composition Major Elective (M)	8
	TOTAL	14

3.1.5A Curriculum Outline for Recording Arts and Science Majors matriculated before AY 2018/2019

I. **Major Requirements** **(80 MC)**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Fundamentals (5 modules) (23 MC) (Maths, Science and Engineering subjects) Major Study Related (18 modules) (57 MC) II. **Faculty Requirements** **(36 MC)** Introduction to Musical Concepts & Materials (4 MC) Compositional Engagement Modules (12 MC) (3 modules, 1 per semester in semesters 2-4) Foundations for Musical Discovery (4 MC) Contextual Engagement Module (4 MC) Introduction to Professional Integration (4 MC) Leading and Guiding Through Music (4 MC) Musical Pathways (4 MC) III. **University Requirements** **(20 MC)** General Education Modules (5 modules from GER, GEQ, GEH, GET, GES) (20 MC) IV. **Unrestricted Electives** **(24 MC)** IV. **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance) Ensemble Activities (as required by the Ensembles & Professional Development Office) Important Notes for Various Student Cohorts: For AY 2015/2016 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **26 MCs.** • Students matriculated from AY 2015/2016 are to note that for the 5 pillars of GE modules, you do not have to follow strictly the exact modules for the General Education Modules (5 modules from GER, GEQ, GEH, GET and GES) Instead, you just need to take a GES module, a GET and a GEH module

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			which is compulsory. For the 2 remaining GE modules, you can either take two more GET modules, 2 more GEH modules, OR 1 GET module and 1 GEH module. For AY 2016/2017 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **24 MCs.** 3.1.5.A1 Curriculum Breakdown for Recording Arts and Science Majors Year 1, Sem 1 Basic Recording 1 (M) 4 MA1505 Maths 1 (M) 4 PC1431 Physics 1E (M) 4 Introduction to Musical Concepts and Materials I (F) 4 Foundations for Musical Discovery (F) 4 TOTAL 20 Year 1, Sem 2 Basic Recording 2 (M) 4 MA1506 Maths 2 (M) 4 PC1432 Physics 2E (M) 4 Introduction to Professional Integration (M) 2 Compositional Engagement Module (F) 4 General Education Module (U) 4 TOTAL 22 Year 2, Sem 1 Multitrack Recording I (M) 4 Acoustics and Psychoacoustics (M) 4 EG1108 Electrical Engineering (M) 3 Compositional Engagement Module (F) 4 Contextual Engagement Module (F) 4 General Education Module (U) 4 TOTAL 23 Year 2, Sem 2 Multitrack Recording 2 (M) 4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Musical Acoustics (M) 4 Circuits and Devices (M) 4 Compositional Engagement Module (F) 4 Leading and Guiding Through Music (M) 4 General Education Module (U) 4 TOTAL 24 Year 3, Sem 1 Audio Mixing (M) 4 Architectural Acoustics & Acoustical Measurement (M) 4 Musical Pathways (M) 4 General Education Module (U) 4 General Education Module (U) 4 TOTAL 20 Year 3, Sem 2 Audio Mastering (M) 4 Electroacoustics (M) 3 Unrestricted Elective (U) 4 Unrestricted Elective (U) 4 Unrestricted Elective (U) 4 TOTAL 19 Year 4, Sem 1 Audio for Media 1 (M) 4 Music Production and Marketing 1 (M) 4 Unrestricted Elective (M) 4 Unrestricted Elective (F) 4 Unrestricted Elective (F) 4 TOTAL 20 Year 4, Sem 2 Audio for Media 2 (M) 4 Music Production and Marketing 2 (M) 4 Internship (M) 4 Unrestricted Elective (M) 2 TOTAL 14

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			3.1.5B Curriculum Outline for Recording Arts and Science Majors matriculated in AY 2018/2019 and beyond I. **Major Requirements** **(72 MC)** Fundamentals of Music Production and Recording 1 and 2 (8 MC) Critical Listening 1 and 2 (8 MC) Live Sound Reinforcement (4 MC) Live Sound Reinforcement Project (4 MC) Final Project (8 MC) Multitrack Recording 1 and 2 (8 MC) Room Acoustics (4 MC) Electroacoustics (4 MC) Audio Postproduction 1 and 2 (8 MC) Audio for Media 1 and 2 (4 MC) Music Production and Marketing (4 MC) 2 Internships in Audio Arts and Sciences (8 MC) II. **Faculty Requirements** **(36 MC)** Introduction to Musical Concepts & Materials (4 MC) Compositional Engagement Modules (12 MC) (3 modules, 1 per semester in semesters 2-4) Foundations for Musical Discovery (4 MC) Contextual Engagement Module (4 MC) Introduction to Professional Integration (4 MC) Leading and Guiding Through Music (4 MC) Musical Pathways (4 MC) III. **University Requirements** **(20 MC)** General Education Modules (5 modules from GER, GEQ, GEH, GET, GES) (20 MC) IV. **Unrestricted Electives** **(32 MC)**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			IV. **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance) Ensemble Activities (as required by the Ensembles & Professional Development Office) 3.1.5.B1 Curriculum Breakdown for Recording Arts and Science Majors Year 1, Sem 1 Critical Listening 1 (M) 4 Fundamentals of Music Production and Recording 1 (M) 4 Introduction to Musical Concepts and Materials I (F) 4 Foundations for Musical Discovery (F) 4 Introduction to Professional Integration (M) 2 General Education Module (U) 4 TOTAL 22 Year 1, Sem 2 Critical Listening 2 (M) 4 Fundamentals of Music Production and Recording 2 (M) 4 Introduction to Professional Integration (M) 2 Compositional Engagement Module (F) 4 General Education Module (U) 4 TOTAL 18 Year 2, Sem 1 Multitrack Recording 1 (M) 4 Room Acoustics (M) 4 Compositional Engagement Module (F) 4 Contextual Engagement Module (F) 4 General Education Module (U) 4 Unrestricted Elective (U) 4 TOTAL 24

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			Year 2, Sem 2	Multitrack Recording 2 (M) 4
				Compositional Engagement Module (F) 4
				Electroacoustics 4
				Leading and Guiding Through Music (M) 4
				General Education Module (U) 4
				Unrestricted Elective (U) 4
				TOTAL 24
			Year 3, Sem 1	Audio Post Production 1(M) 4
				Music Production and Marketing (M) 4
				Live Sound Reinforcement 4
				Musical Pathways (M) 4
				General Education Module (U) 4
				General Education Module (U) 4
				TOTAL 24
			Year 3, Sem 2	Audio Post Production 2(M) 4
				Live Sound Reinforcement 4
				Unrestricted Elective (U) 4
				Unrestricted Elective (U) 4
				Unrestricted Elective (U) 4
				TOTAL 20
			Year 4, Sem 1	Audio for Media (M) 4
				Internship 1 (M) 4
				Unrestricted Elective (M) 4
				Unrestricted Elective (F) 4
				Unrestricted Elective (F) 4
				TOTAL 20
			Year 4, Sem 2	Audio for Media Project (M) 4
				Internship 2 (M) 4

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Final Project 8 TOTAL 14 3.1.6 Curriculum Overall Outline for Piano Majors I. **Major Requirements** **(82 MC)** Applied Major Studies (8 modules, 1 per semester) (52 MC) **Ensembles/Class Activities** **(30 MC)** Year 1 Accompaniment - 2 semesters x 2 MC (4 MC) Year 1 Piano Ensemble - 2 semesters x 2 MC (4 MC) Year 3 Keyboard Skills - 1 semester x 2 MC (2 MC) Collaborative Piano (Year 2): 2 semesters x 4 MC (8 MC) - Piano duos, Instrumental duos, Chamber music New Music – 1 semester x 4 MC (4 MC) Orchestral Studies for Pianists – 1 semester x 4 MCs (4 MC) Keyboard Pedagogy – 1 semester x 4 MC (4 MC) II. **Faculty Requirements** **(36 MC)** Introduction to Musical Concepts & Materials (4 MC) Compositional Engagement Modules (12 MC) (3 modules, 1 per semester in semesters 2-4) Foundations for Musical Discovery (4 MC) Contextual Engagement Module (4 MC) Introduction to Professional Integration (4 MC) Leading and Guiding Through Music (4 MC) Musical Pathways (4 MC) III. **University Requirements** **(20 MC)** General Education Modules(5 modules from GER, GEQ, GEH, GET, GES) IV. **Unrestricted Electives** **(22 MC)**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			V. **Conservatory Requirements** **(no MC)** Noon Recitals (6 semesters of satisfactory attendance) Ensemble Activities (as required by the Ensembles & Professional Development Office) For AY 2015/2016 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **26 MCs**. • Students matriculated from AY 2015/2016 are to note that for the 5 pillars of GE modules, you do not have to follow strictly the exact modules for the General Education Modules (5 modules from GER, GEQ, GEH, GET and GES) Instead, you just need to take a GES module, a GET and a GEH module which is compulsory. For the 2 remaining GE modules, you can either take two more GET modules, 2 more GEH modules, OR 1 GET module and 1 GEH module. For AY 2016/2017 cohort: • Students need to take a total of Unrestricted Electives worth a total number of **24 MCs.** 3.1.6.1 Curriculum Breakdown for Piano Majors by Semester Year 1, Sem 1 Major Study (M) 6 Class Activities relating to Major Study (M) 4 Introduction to Musical Concepts & Materials (F) 4 Foundations for Musical Discovery (F) 4 General Education Module (U) 4 TOTAL 22 Year 1, Sem 2 Major Study (M) 6 Class Activities relating to Major Study (M) 4 Introduction to Professional Integration (F) 2 Compositional Engagement Module (F) 4 General Education Module (U) 4 TOTAL 20

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)		
			Year 2, Sem 1	Major Study (M)	6
				Class Activities relating to Major Study (M)	4
				Compositional Engagement Module (F)	4
				Contextual Engagement Module (F)	4
				General Education Module (U)	4
					TOTAL 22
			Year 2, Sem 2	Major Study (M)	6
				Class Activities relating to Major Study (M)	4
				Compositional Engagement Module (F)	4
				Leading and Guiding Through Music (F)	4
				General Education Module (U)	4
					TOTAL 22
			Year 3, Sem 1	Junior Recital (M)	6
				Class Activities relating to Major Study (M)	6
				Musical Pathways (F)	4
				General Education Module (U)	4
				Unrestricted Elective (U)	4
					TOTAL 24
			Year 3, Sem 2	Major Study(M)	6
				Class Activities relating to Major Study (M)	8
				Unrestricted Elective (U)	4
					TOTAL 18
			Year 4, Sem 1	Major Study (M)	6
				Class Activities relating to Major Study (M)	4
				Unrestricted Elective (F)	4
				Unrestricted Elective (U)	4
					TOTAL 18
			Year 4, Sem 2	Senior Recital (M)	10

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>Unrestricted Elective (M) 2
TOTAL 12</td></tr>
<tr><td>63.</td><td>3 Aug 2017</td><td>RVRC</td><td>http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/ridge-view-residential-college-programme/rvrc-and-fulfilment-of-graduation-requirements/

GEQ1917 (formerly GEM1917) fulfils the ‘Asking Questions’ pillar, which is one of the five General Education modules required of all undergraduates. RVRC students who have read and completed this module would have satisfied the “Asking Questions” pillar.

ES1601 can be taken in lieu of the compulsory writing and/or communication module(s) in Faculty of Arts & Social Sciences (FAS1102), Faculty of Science (SP1541), Faculty of Engineering (~~both~~ ES1531 ~~and ES2331~~), NUS Business School (ES2002 or MNO2706) School of Computing (CS2101 or IS2101) and School of Design & Environment (ES2007D). ~~NUS Business School students in the RVRC Programme will be advised at a later stage on whether their faculty’s writing and/or communication equivalents can be satisfied with ES1601.~~</td></tr>
<tr><td>64.</td><td>6 Mar 2018</td><td>RVRC</td><td>Update to the NUS Bulletin 2017/18 for the Ridge View Residential College Programme:

<table><tr><td>URL for the change</td><td>http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/ridge-view-residential-college-programme/rvrc-and-fulfilment-of-graduation-requirements/</td></tr><tr><td>Screenshot of current page</td><td></td></tr><tr><td>Description of change (with changes tracked in red)</td><td>GEQ1917 (formerly GEM1917) fulfils the ‘Asking Questions’ pillar, which is one of the five General Education modules required of all undergraduates. RVRC students who have read and completed this module would have satisfied the “Asking Questions” pillar.

ES1601 can be taken in lieu of the compulsory writing and/or communication module(s) in Faculty of Arts & Social Sciences (FAS1102), Faculty of Science (SP1541), Faculty of Engineering (ES1531), NUS Business School (ES2002 or</td></tr></table></td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>MNO2706), School of Computing (CS2101 or IS2101) and School of Design & Environment (ES2007D). For students in the Architecture, Industrial Design, Project and Facilities Management, Environmental Studies and Pharmacy degree programmes, it qualifies as an Unrestricted Elective Module.</td></tr>
</table>
</td></tr>
<tr><td>65.</td><td>6 Jun 2018</td><td>RO</td><td>
<u>Update 1 – YSTCM - New Minor</u>

YSTCM’s new Minor in Music and Society was inserted as indicated in red below:
http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/minor-programmes.html

<table>
<tr><td>Engineering Materials (formerly Minor in Materials Science and Engineering; prior to AY2005/06)</td><td>Faculty of Science and Faculty of Engineering</td><td>Restricted</td></tr>
<tr><td>Medical Physics</td><td>Department of Biomedical Engineering and Department of Physics</td><td>Restricted</td></tr>
<tr><td colspan="3">Yong Siew Toh Conservatory of Music</td></tr>
<tr><td>Music and Society</td><td>Yong Siew Toh Conservatory of Music</td><td>Restricted</td></tr>
<tr><td>University Scholars Programme (USP)</td><td colspan="2"></td></tr>
<tr><td>China Studies*</td><td>USP – Faculty of Arts and Social Sciences (FASS)</td><td>For USP-FASS students in USP-Yuanpei Exchange Programme</td></tr>
</table>
Note for students who are interested to do a Minor programme during the course of their candidature:

'Open' Minor - students can declare their intention to do an open minor via the Centralised Online Registration System (CORS) <u>without</u> any prior approval from the Host Faculty/Department.
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			'Restricted' Minor - students are required to apply to the Host Faculty/Department and obtain approval to read a restricted minor. * These programmes allow for up to 16 MCs of ungraded substitutable modules to be accepted from the partner university. ---------- **Update 2 – YSTCM – New Second Majors** Please insert YSTCM's new Minor in Music and Society as indicated in red below: http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html The second majors that are currently on offer are: Business Analytics Bassoon Cello Chemistry Chinese Language Chinese Studies Communications and New Media Composition Computer Science Clarinet Data Analytics Double Bass Economics English Language English Literature European Studies Flute Food Science Geography Harp

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			History Horn Information Security Innovation and Design Japanese Studies Life Sciences Malay Studies Management Management (Technology) Mathematics Oboe Percussion Philosophy Physics Piano Political Science Psychology Recording Arts and Sciences Social Work Sociology Southeast Asian Studies South Asian Studies Statistics Systems Engineering Theatre Studies Trumpet Trombone Tuba Voice Violin Viola
66.	23 Jun 2017	RO	1. The page on University Organisation (http://www.nus.edu.sg/nusbulletin/generalinformation/university-organisation/) should only contain the description on “The Chancellory”, followed by a link to another page where the

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			details on the Chancellor and 5 Pro-Cs are then shown. 2. The content for the Chancellery was replaced with the following: The President of the Republic of Singapore is the Chancellor of the University. The Chancellor holds the authority toconfer degrees and presides at Commencement when present. The Chancellor may appoint such persons to be Pro-Chancellors as he may consider proper. If for any reason the Chancellor is unable to exercise any of his functions, he may authorise any of the Pro-Chancellors to exercise those functions on his behalf. There are currently five Pro-Chancellors appointed by the Chancellor. The University Chancellery are as follows: ==========
67.	21 Nov 2017	RO	Updates to Special Programmes websites and NUS Bulletin – 21 Nov 2017 **Update 1 – Delete the following JDP:** http://www.nus.edu.sg/registrar/education-at-nus/graduate-education/special-graduate-programmes/double-degree-and-joint-degree-programmes-with-overseas-universities.html ~~**JDP with University of Basel, Switzerland**~~ ~~– Master of Science in Infectious Diseases, Vaccinology and Drug Discovery (by research)~~ Update 2 - FoS/FoE - Double Degree Programme in BSc/BSc(Hons) in Physics and BEng(MSE) discontinued from Cohort 17/18 onwards (a) Double Degree Programmes **- Delete the following DDP:** http://nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-degree-programmes.html

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			~~Materials Science and Engineering & Physics~~ --- (b) List of Double Degree Programmes (FAQs) - **Delete the DDP and re-number the rest of the DDP after it:** http://nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/faqs-for-ddp-cdp-and-dm.html#ddp01 FAQ No. 1: …….. The following DDPs are only available for non-direct admission (i.e. opened to those who completed first level of study) ~~a. Engineering (Materials Science & Engineering)/Physics~~ (Also, delete a. Business Administration (Accountancy)/Law b. ….. c. ….. d. ….. e. ….. (c) NUS Bulletin AY 2017/18 – Faculty of Science - **Delete the discontinued DDP (item 3.4.4) and re-number the programmes after it (as reflected in red below) and also go into the respective hyperlinks and make the same amendments):** http://www.nus.edu.sg/nusbulletin/faculty-of-science/

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			3.4.3.14 Minor in Physics 3.4.3.15 Minor in Statistics ~~3.4.4 Double Degree Programmes in Materials Science and Engineering (BEng) and Physics [BSc/BSc (Hons)]~~ 3.4.4 Double Degree Programmes in Law (LLB) and Life Sciences [BSc/BSc (Hons)] 3.4.5 Double Degree Programmes in Computing (BComp) and Mathematics [BSc/BSc (Hons)] 3.4.6 NUS-ANU Joint Degree Programme: Bachelor of Science (Hons) from National University of Singapore and Bachelor of Philosophy (Hons) from Australian National University 3.4.7 Joint Bachelor of Science (Honours) in Life Sciences from National University of Singapore and Bachelor of Science in Biology from The University of North Carolina at Chapel Hill 3.4.8 Concurrent MSc (Mgt) and BSc (Hons) / BApplSc (Hons) 3.4.9 Concurrent Programme in BSc (Hons) in Life Sciences – MRes in Molecular Biophysics between Faculty of Science, National University of Singapore and Faculty of Life Sciences and Medicine, King's College London 3.4.10 Concurrent Programmes in Bachelor of Science (Honours) in Chemistry/Life Sciences of National University of Singapore and Master of Science in Forensic Science/Analytical Toxicology of King's College London **In addition, delete section on the discontinued DDP:**

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/double-degree-programmes-in-materials-science-and-engineering-b-eng-and-physics-b-sc-b-sc-hons/ (d) NUS Bulletin AY 2017/18 – Faculty of Engineering - **Delete the discontinued DDP (item 3.5.4.4) and re-number the programmes after it (as reflected in red below) and also go into the respective hyperlinks and make the same amendments):** http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/ 3.5.4 Double Degree Programmes 3.5.4.1 Double Degree Programme with French Grandes Écoles (FDDP) 3.5.4.2 Double Degree Programme in Business Administration and Engineering 3.5.4.3 Double Degree Programme in Engineering and Economics ~~3.5.4.4 Double Degree Programme in Materials Science & Engineering and Physics~~ 3.5.5 Double Major Programmes **……** --- **In addition, delete section on the discontinued DDP:** http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/special-programmes/double-degree-programmes/double-degree-programme-in-materials-science-and-engineering-and-physics/

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
68.	14 Feb 2018	RO	The new second major was included as indicated in red below: http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html ….. The second majors that are currently on offer are: Business Analytics Chemistry Chinese Language Chinese Studies Communications and New Media Computer Science Data Analytics Economics English Language English Literature European Studies Food Science Geography History Information Security Innovation and Design (please link to https://www.eng.nus.edu.sg/undergraduatestudies/special-programmes/innovation-and-design-2nd-major/) Japanese Studies Life Sciences Malay Studies Management Management (Technology) Mathematics Philosophy Physics Political Science Psychology Recording Arts and Sciences Social Work Sociology Southeast Asian Studies South Asian Studies

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>Statistics
Systems Engineering
Theatre Studies</td></tr>
<tr><td>69.</td><td>29 Mar 2018</td><td>RO</td><td>NUS Bulletin 2017/18 – Update GI regarding mention of past Bulletins (29 Mar 2018)

At http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/continuation-and-graduation-requirements.html:
The sentence was removed as highlighted in red below:

Degree Classification
The criteria for degree classification applicable to students admitted from AY2012-2013 onwards are as follows:
Honours Degree Classification (i) — Criteria
Honours (Highest Distinction) — CAP 4.50 and above (ii)
Honours (Distinction) — CAP 4.00 – 4.49
Honours (Merit) — CAP 3.50 – 3.99
Honours — CAP 3.00 – 3.49
Pass — CAP 2.00 – 2.99
Bachelor's Degree Classification (iii) — Criteria
Pass with Merit — CAP 3.00 and above
Pass — CAP 2.00 – 2.99
(i) This refers to 160-MC degree programmes.
(ii) Particular Faculties/Schools may stipulate other requirements.
(iii) This refers to 120-MC degree programmes.
(Students admitted prior to AY2012/2013 should refer to the General Information section of the archived NUS Bulletin relevant to their year of admission.)</td></tr>
<tr><td>70.</td><td>31 May 2018</td><td>RO</td><td>Double/Concurrent/Joint Degree Programmes with Overseas Universities</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
(http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-concurrent-joint-degree-programmes-with-overseas-universities.html)

The list of programmes were amended as indicated in red below. The comments in the ‘Remarks’ column are for reference only.The various double/concurrent/joint degree programmes with overseas universities are as follows:
<table>
<tr><th>DDPs with premier French Grandes Ecoles</th><th>Remarks</th></tr>
<tr><td>Bachelor/Master of Engineering or Bachelor/Master of Science ~~or Bachelor of Applied Science/Master of Science~~ or Bachelor/Master of Computing from NUS and Diplôme d'Ingénieur from French Grande École (the equivalent of Masters in France)</td><td>---</td></tr>
<tr><td>DDP with Sciences Po</td><td>---</td></tr>
<tr><td>Bachelor with Honours Degree from NUS and Bachelor of Arts from Sciences Po
(for students in the University Scholars Programme)</td><td>---</td></tr>
<tr><td>DDP with Waseda University</td><td>To remove the hyperlink for this subheading</td></tr>
<tr><td>➢ Bachelor with Honours Degree from NUS and Bachelor of Arts in International Liberal Studies from Waseda University
(for students in the University Scholars Programme)</td><td>---</td></tr>
<tr><td>Concurrent Double Masters Degree Programme ~~Progrmame~~ with the Global alliance in Management Education (CEMS)</td><td>To remove the hyperlink for this subheading</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			➢ Bachelor's and Master of Science (Management) Concurrent Degrees (NUS) and the Master's in International Management (MIM) (Global Alliance in Management Education (CEMS))	To hyperlink to http://mim.nus.edu/academics/concurrent-degree-programme/
			~~**CDP with Brown University**~~	To delete this subheading
			➢ ~~Bachelor of Science (Computational Biology) Honours from NUS and Scientiae Magister in Computer Science (Computational Biology) from Brown University~~	To delete this programme
			➢ ~~Bachelor of Computing (Computer Science) Honours from NUS and Scientiae Magister in Computer Science from Brown University~~	To delete this programme
			CDP with Carnegie Mellon University	**---**
			➢ Bachelor of Computing (Computer Science) from NUS and Master of Entertainment Technology from Carnegie Mellon University	---
			~~**CDP with King's College London**~~	To delete this subheading
			➢ ~~Bachelor of Science (Honours) in Life Sciences from NUS and Master of Research (M.Res.) in Molecular Biophysics from Faculty of Life Sciences & Medicine, King's College London (KCL)~~	To delete this programme
			➢ ~~Bachelor of Science (Honours) in Chemistry from NUS and Master of Science in Forensic Science/Analytical Toxicology, from Faculty of Life Sciences and Medicine, King's College London (KCL)~~	To delete this programme
			➢ ~~Bachelor of Science (Honours) in Life Sciences from NUS and Master of Science in Forensic Science/Analytical Toxicology, from Faculty of Life Sciences and Medicine, King's College London (KCL)~~	To delete this programme

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)	
			CDP with University of Melbourne	To insert this new subheading
			➢ Bachelor of Science in Life Sciences from NUS and Doctor of Veterinary Medicine, University of Melbourne	To insert this new programme and hyperlink to http://www.lifesciences.nus.edu.sg/info/lsm_cdpuomelbdvm.pdf
			JDPs with Australian National University	To remove the hyperlink for this subheading
			➢ Joint Bachelor of Social Sciences (Honours) in Actuarial Studies and Economics	---
			➢ Joint Bachelor of Arts (Honours) NUS and Bachelor of Philosophy (Honours) ANU (for students in the University Scholars Programme)	---
			➢ Joint Bachelor of Science (Honours) NUS and Bachelor of Philosophy (Honours) ANU (for students in the University Scholars Programme)	---
			JDPs with University of Dundee	To insert new subheading
			➢ Joint Bachelor of Science (Honours) in Life Sciences, NUS and Bachelor of Science (Honours) in Biological Sciences/Biomedical Sciences from University of Dundee	To insert this new programme and hyperlink to http://www.lifesciences.nus.edu.sg/info/lsm_jdpuodundee.pdf

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>JDP with University of North Carolina-Chapel Hill</td><td>To remove the hyperlink for this subheading</td></tr>
<tr><td>➢ Joint Bachelor of Arts (Honours)</td><td>---</td></tr>
<tr><td>➢ Joint Bachelor of Science (Honours)</td><td>---</td></tr>
<tr><td>Joint Degree Programme with the Peabody Institute of The Johns Hopkins University</td><td>---</td></tr>
<tr><td>➢ Joint Bachelor of Music</td><td>---</td></tr>
</table>
</td></tr>
<tr><td>71.</td><td>4 Jun 2018</td><td>RO</td><td>
http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/minor-programmes.html

The new Minor is indicated as indicated in red below:

<table>
<tr><th>Minor</th><th>Host Faculty/Department</th><th>Type (see 'Note' below)</th></tr>
<tr><td>Faculty of Arts & Social Sciences</td><td></td><td></td></tr>
<tr><td>Disciplinary Minors</td><td></td><td></td></tr>
<tr><td>…..</td><td></td><td></td></tr>
<tr><td>History</td><td>Department of History</td><td>Open</td></tr>
<tr><td>Human Services</td><td>Department of Social Work</td><td>Open</td></tr>
<tr><td>India Studies (formerly Minor in South Asian Studies; offered to Cohort 2006-2007 only)</td><td>South Asian Studies Programme (Offered to Cohort 2008 onwards)</td><td>Open</td></tr>
<tr><td>Japanese Studies</td><td>Department of Japanese Studies</td><td>Open</td></tr>
<tr><td>Joint Minor with University of Toronto (UoT)</td><td>Department of Geography</td><td>Restricted</td></tr>
<tr><td>Language Studies</td><td>Centre for Language Studies</td><td></td></tr>
<tr><td>Malay Studies</td><td>Department of Malay Studies</td><td>Open</td></tr>
<tr><td>Philosophy</td><td>Department of Philosophy</td><td>Open</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Political Science</td><td>Department of Political Science</td><td>Open</td></tr>
<tr><td>Psychology</td><td>Department of Psychology</td><td>Open</td></tr>
<tr><td>Sociology</td><td>Department of Sociology</td><td>Open</td></tr>
<tr><td>Southeast Asian Studies</td><td>Department of Southeast Asian Studies</td><td>Open</td></tr>
<tr><td>Theatre Studies</td><td>Department of English Language & Literature</td><td>Open</td></tr>
</table>
</td></tr>
<tr><td>72.</td><td>6 Jun 2018</td><td>RO</td><td>Double Major Programmes (6 Jun 2018)

http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html

Please insert the 2 new second majors from YSTCM, as highlighted in red below:

……
……..

The second majors that are currently on offer are:
….
…..
History
Horn
Information Security
Innovation and Design
Japanese Studies
Life Sciences
Malay Studies
Management
Management (Technology)
Mathematics
Music and Society (please link to https://www.ystmusic.nus.edu.sg/courses-for-nus)</td></tr>
</table>

S/N	Date	Faculty/ School/	(A) Updates included in NUS Bulletin 2017-18 before archival (i.e., up to 30 June 2018)
			Music, Collaboration and Production *(please link to https://www.ystmusic.nus.edu.sg/courses-for-nus)* Oboe Percussion Philosophy Physics Piano Political Science Psychology Recording Arts and Sciences ….. ……

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
1.	29 Jun 2019	FoS	**Updates for Archived Bulletin AY2017/18 (as of 28 Jun 2019**) **Circular title:** Addendum to Revision of the Minor Programme in Forensic Science **Circular no.:** BUS Circular 4 of AY2018/19, RO.420/18 **To be changed for cohort number(s):** AY2017/18 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf **Current:** To be awarded a minor in Forensic Science, a student must pass the six modules as set out below: 1. GEK1542 or LSM1306 Forensic Science 2. CM3301 Advanced Forensic Science 3. SP3202 Evidence in Forensic Science 4. Choose 3 from the following elective modules: CM2101 Physical Chemistry 2 CM2142 Analytical Chemistry1 OR CM3242 Instrumental Analysis II LSM1102 Molecular Genetics LSM3211 Fundamental Pharmacology Please refer to http://www.chemistry.nus.edu.sg/education/undergrads/Minor/forensic.htm for more information on the minor, the admission requirements as well as the application form. **Revision/Replacement (taken from 19/20's webpage)** To be awarded a Minor in Forensic Science, a student must pass at least 24MC as set out below: **Essential Modules – Pass the following 3 modules (3 x 4MC = 12MC):** LSM1306 Forensic Science SP3202 Evidence in Forensic Science CM3301 Advanced Forensic Science

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Elective Modules – Pass 12MCs of the following modules, including: **a) A maximum of 4MC from Level 1000 modules in the list** **b) A minimum of 4MC from Level 4000 modules in the list (for Cohorts AY17/18 onwards)** SP4261 Articulating Probability and Statistics in Court SP4262 Forensic Human Identification SP4263 Forensic Toxicology and Poisons SP4264 Criminalistics: Evidence and Proof [This is a 2MC module. Please complete an equivalent of 12 MC of elective modules for the purpose of Minor fulfilment.] SP4265 Criminalistics: Forgery Exposé with Forensic Science [This is a 2MC module. Please complete an equivalent of 12 MC of elective modules for the purpose of Minor fulfilment.] CM2101 Physical Chemistry 2 CM3242 Instrumental Analysis II LSM1102 Molecular Genetics LSM3211 Fundamental Pharmacology PC1141 Introduction to Classical Mechanics PR1110/A Foundations in Medicinal Chemistry PR3116 Concepts in Pharmacokinetics & Biopharmaceutics ST2334 Probability and Statistics; OR MA2216/ST2131 Probability CM/FST/LSM/MA/PC/PR/ST/ZB3288 Advanced UROPS I (Forensic-Science related; subject to approval of Minor programme coordinator) ***Note:*** *Please take note that the double-counting between a Major and this Minor in Forensic Science is up to 8MC or typically two modules only. Please read sufficient additional modules to fulfil the two programmes.* *Application is required to read this minor. For the application process and more information, please refer to http://www.dbs.nus.edu.sg/doc/education/FSminor.html* --- **Circular title:** Biological Sciences: Revision to the Requirements of the Joint Minor Programme in Environmental Biology with University of Toronto **Circular no.:** BUS Circular 4 of AY2018/19, RO.422/18 **To be changed for cohort number(s):** AY2016/17 onwards

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Archived Bulletin AY2017/18 **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 196/243 **Current text:** To be awarded the joint minor in Environmental Biology, a student is currently required to read and pass the modules as prescribed: LSM1103 Biodiversity LSM2251 Ecology and Environment LSM3252 Evolution and Comparative Genomics and any four of the following UofT courses: EEB403H Tropical Field Biology (May) EEB405H Temperate Field Biology (May) EEB407H Alpine Ecosystems (July or August) EEB410H Lake Ecosystem Dynamics (August) ENV234H Environmental Biology: Structure and Function of Ecosystems EEB318H Principles of Evolution EEB321H Community Ecology EEB322H Behaviour and Behavioural Ecology EEB323H Evolutionary Genetics EEB328H Physiological Ecology EEB331H Introduction to the Fungi EEB362H Introduction to Macroevolution EEB375H Organisms and Their Environment EEB382H Diversity of Fishes EEB388H Biology of Mammals EEB319H Population Ecology EEB324H Evolutionary Ecology EEB330H Systematic Botany EEB356H Insect Biology EEB365H The Biology of Conservation EEB386H Avian Biology

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Revised text: To be awarded the joint minor in Environmental Biology, a student is currently required to read and pass the modules as prescribed: LSM2252 Biodiversity LSM2251 Ecology and Environment LSM1105 Evolutionary Biology and any four of the following UofT courses: ENV234H1 Environmental Biology: Structure and Function of Ecosystems EEB319H1 Population Ecology EEB321H1 Community Ecology EEB322H1 Behaviour and Behavioural Ecology EEB323H1 Evolutionary Genetics EEB324H1 Evolutionary Ecology EEB328H1 Physiological Ecology EEB330H1 Systematic Botany EEB331H1 Introduction to the Fungi EEB362H1 Macroevolution EEB365H1 Topics in Applied Conservation Biology EEB375H1 Organisms and Their Environment EEB380H1 Diversity of Insects EEB382H1 Diversity of Fishes EEB386H1 Diversity of Birds EEB388H1 Diversity of Mammals EEB403H0/1 Tropical Field Biology EEB405H0/1 Temperate Field Biology Alpine Ecosystems EEB410H0/1 EEB410H0/1 Lake Ecosystem Dynamics --- **Circular title:** Physics: Proposed Changes to the Requirements for the Second Major in Physics Programme **Circular no.:** BUS Circular 4 of AY2018/19, RO.423/18 **To be changed for cohort number(s):** AY2015/16 onwards **Archived Bulletin AY2017/18**

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Link: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 148/243 **Current text:** Pass Any four from the following • PC3130 Quantum Mechanics II • PC3193 Experimental Physics II • PC3231 Electricity and Magnetism II • PC3232 Nuclear and Particle Physics • PC3246 Astrophysics I • PC3274 Mathematical Methods in Physics II • PC3233 Atomic and Molecular Physics I • PC3235 Solid State Physics I • PC3236 Computational Methods in Physics • PC3238 Fluid Dynamics • PC3241 Solid State Devices • PC3242 Physics of Semiconductor Processing| • PC3243 Photonics • PC3267 Biophysics II • PC3247 Modern Optics • PC3251 Nanophysics • PC3239 Special Problems in Undergraduate Physics **Revised text:** Any four modules from the following: • PC3130 Quantum Mechanics II • PC3193 Experimental Physics II • ALL PC32XX and PC42XX modules that can be used to fulfil the requirements for the Major Programme in Physics. --- **Circular title:** Physics: Proposal for a New Specialisation in Quantum Technologies for the existing Bachelor of Science with a Major in Physics (Follow-up from AY18-19 SFCC 1 Meeting)

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
Circular no.: Senate Circular 3 of 2018/19 (RO.466/18)
To be changed for cohort number(s): AY2016/17 onwards

<u>Archived Bulletin AY2017/18</u>

1) Link: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 34/243

<u>Current text:</u>
• Physics (with specialisation in Astrophysics)
• Physics (with specialisation in Nanophysics)
• Quantitative Finance

<u>Revised text:</u>
• Physics (with specialisation in Astrophysics)
• Physics (with specialisation in Nanophysics)
• Physics (with specialisation in Quantum Technologies)
• Quantitative Finance

2) Link: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 45/243

<u>Current text:</u>
<table>
<tr><td>20. Physics
21. Physics (with specialisation in Astrophysics)
22. Physics (with specialisation in Nanophysics)</td></tr>
<tr><td>23. Pharmacy@†</td></tr>
<tr><td>24. Environmental Studies#+^ (Specialisation in Environmental Biology)</td></tr>
</table>

<u>Revised text:</u>
<table>
<tr><td>20. Physics</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>21. Physics (with specialisation in Astrophysics)
22. Physics (with specialisation in Nanophysics)
23. Physics (with specialisation in Quantum Technologies)</td></tr>
<tr><td>24. Pharmacy@†</td></tr>
<tr><td>25. Environmental Studies#+^ (Specialisation in Environmental Biology)</td></tr>
</table>

3) Link: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 48/243

<u>Current text:</u>
<table>
<tr><td>Physics (PC)</td></tr>
<tr><td>Physics (with specialisation in Astrophysics)
(PC)</td></tr>
<tr><td>Physics (with specialisation in Nanophysics)
(PC)</td></tr>
</table>

<u>Revised text:</u>
<table>
<tr><td>Physics (PC)</td></tr>
<tr><td>Physics (with specialisation in Astrophysics)
(PC)</td></tr>
<tr><td>Physics (with specialisation in Nanophysics)
(PC)</td></tr>
<tr><td>Physics (with specialisation in Quantum Technologies)
(PC)</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			4) Link: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 111/243 **Current text:** **Programme Structure and Curriculum Rationale** B.Sc. and B.Sc. (Hons.) in Physics are rigorous courses covering the core topics in physics. The broadness of the scope and the training in critical thinking and in analysis will enable graduates to choose from a wide variety of careers. B.Sc. (Hons.) students can choose to specialise in one of the following areas: (i) Astrophysics, and (ii) Nanophysics. These programmes will prepare graduates with in-depth knowledge in each area of specialisation. **Revised text:** **Programme Structure and Curriculum Rationale** B.Sc. and B.Sc. (Hons.) in Physics are rigorous courses covering the core topics in physics. The broadness of the scope and the training in critical thinking and in analysis will enable graduates to choose from a wide variety of careers. B.Sc. (Hons.) students can choose to specialise in one of the following areas: (i) Astrophysics, (ii) Nanophysics and (iii) Quantum Technologies. These programmes will prepare graduates with in-depth knowledge in each area of specialisation. **5) Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 115/243 **Current text:** B.Sc. (Hons.) students majoring in Physics have the option to qualify for a specialisation in 1. Astrophysics, or 2. Nanophysics. **Revised text:** B.Sc. (Hons.) students majoring in Physics have the option to qualify for a specialisation in 1. Astrophysics, 2. Nanophysics or 3. Quantum Technologies. **6) Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 116/243

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<u>To add the following text in red and table in red right below the table in black:</u>
<table>
<tr><td>MODULE LEVEL</td><td>SPECIALISATION REQUIREMENTS</td><td>CUMULATIVE MAJOR MCS</td></tr>
<tr><td>Level-3000
and
Level-4000</td><td>Pass any 24 MCs from the following:
PC3235 Solid State Physics I
PC3241 Solid State Devices
PC3242 Physics of Semiconductor Processing
PC3243 Photonics
PC4246 Quantum Optics
PC4253 Thin Film Technology
PC4259 Surface Physics
PC4199 Honours Project in Physics (Nanophysics)**</td><td>24</td></tr>
</table>
To be awarded a specialisation in Quantum Technologies, candidates must read and pass the following modules as part of the major requirements for B.Sc. (Hons.) with a primary major in Physics.
<table>
<tr><td>MODULE LEVEL</td><td>SPECIALISATION REQUIREMENTS</td><td>CUMULATIVE MAJOR MCS</td></tr>
<tr><td>Level-3000
and
Level-4000</td><td>Pass
PC4228 Device physics for Quantum Technology (4MC)
PC4199 Honours Project in Physics, on a related subject[*] (12MC)

<u>And</u>

Pass any two of these modules, with at least one Level 4000 module, among the following, each 4MC:
PC3233 Atomic and Molecular Physics I
PC3288 Advanced UROPS in Physics I, on a related subject [*]
PC4230 Quantum Mechanics III
PC4243 Atomic and Molecular Physics II</td><td>24</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			<table><tr><td></td><td>PC4246 Quantum Optics</td><td></td></tr></table> [*] A coordinator of the specialisation, chosen by the Department of Physics, will be in charge of assessing the suitability of the subject. Further pertinent new modules may be introduced in the future, should such need arise. **7) Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 163/243 **Existing text:** This minor is not awarded with a primary major in Physics or Physics (with specialisation in Astrophysics or Nanophysics) and second major in Physics. **Revised text:** This minor is not awarded with a primary major in Physics or Physics (with specialisation in Astrophysics, Nanophysics or Quantum Technologies) and second major in Physics.
2.	2 Jul 2019	FoS	**Updates for Archived Bulletin AY2017/18 (as of 2 Jul 2019)** **Circular title:** Physics: Proposed Changes to the Requirements for the Major in Physics Programme **Circular no.:** BUS Circular No. 4, AY2018/19 (dated 6 Sep 2018) **To be changed for cohort number(s):** AY2015/16 onwards **Circular title:** Physics: Proposed Changes to the Requirements for the Major in Physics Programme **Circular no.:** SFCC Circular 12 **To be changed for cohort number(s):** AY2017/18 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 113 to 114/243 **Current text:**

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			3. Pass: - PC3130 Quantum Mechanics II - PC3193 Experimental Physics II And any three modules from the following electives: - PC3231 Electricity and Magnetism II - PC3232 Nuclear and Particle Physics - PC3233 Atomic and Molecular Physics I - PC3235 Solid State Physics - PC3236 Computational Methods in Physics - PC3238 Fluid Dynamics - PC3241 Solid State Devices - PC3242 Physics of Semiconductor Processing - PC3243 Photonics - PC3246 Astrophysics I - PC3247 Modern Optics - PC3251 Nanophysics - PC3267 Biophysics II - PC3233 Atomic and Molecular Physics I - PC3235 Solid State Physics I - PC3236 Computational Methods in Physics - PC3238 Fluid Dynamics - PC3241 Solid State Devices - PC3242 Physics of Semiconductor Processing - PC3243 Photonics - PC3246 Astrophysics I - PC3247 Modern Optics - PC3251 Nanophysics - PC3267 Biophysics II - PC3274 Mathematical Methods in Physics II - PC3239 Special Problems in Undergraduate Physics II - PC3288 Advanced UROPS in Physics I^

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			- PC3289 Advanced UROPS in Physics II^ - MLE3101 Materials Characterization Laboratory - MLE3105 Dielectric and Magnetic Materials (3 MCs) Pass PC4199 Honours Project in Physics And any five modules from the following electives: • PC4230 Quantum Mechanics III • 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 General Relativity • PC4249 Astrophysics II • PC4253 Thin Film Technology • PC4259 Surface Physics • PC4262 Remote Sensing • PC4264 Advanced Solid State Devices • PC4267 Biophysics III • PC4268 Biophysical Instrumentation and Biomolecular Electronics • PC4274 Mathematical Methods in Physics III • EE4437 Photonics – Principles and Applications • EE4413 Low-dimensional Electronic Devices • MLE4201 Advanced Materials Characterisation# • MLE4204 Synthesis and Growth of Nanostructures# • MLE4205 Theory and Modelling of Materials Properties# **Revised text:** 3. Pass: - PC3130 Quantum Mechanics II - PC3193 Experimental Physics II

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			And any three modules from the following electives: - 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 - PC3241 Solid State Devices - PC3242 Physics of Semiconductor Processing - PC3243 Photonics - PC3246 Astrophysics I - PC3247 Modern Optics - PC3251 Nanophysics - PC3267 Biophysics II - PC3274 Mathematical Methods in Physics II - PC3239 Special Problems in Undergraduate Physics II - PC3288 Advanced UROPS in Physics I^ - PC3289 Advanced UROPS in Physics II^ - PC3294 Radiation Laboratory ~~- MLE3101 Materials Characterization Laboratory~~ ~~- MLE3105 Dielectric and Magnetic Materials (3 MCs)~~ Pass PC4199 Honours Project in Physics And any five modules from the following electives: • PC4230 Quantum Mechanics III • PC4236 Computational Condensed Matter Physics • PC4240 Solid State Physics II • PC4241 Statistical Mechanics • PC4242 Electrodynamics • PC4243 Atomic and Molecular Physics II • PC4245 Particle Physics

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			• PC4246 Quantum Optics • PC4248 General Relativity • PC4249 Astrophysics II • PC4253 Thin Film Technology • PC4259 Surface Physics • PC4262 Remote Sensing • PC4264 Advanced Solid State Devices • PC4267 Biophysics III • PC4268 Biophysical Instrumentation and Biomolecular Electronics • PC4274 Mathematical Methods in Physics III ~~• EE4437 Photonics – Principles and Applications~~ ~~• EE4413 Low-dimensional Electronic Devices~~ ~~• MLE4201 Advanced Materials Characterisation#~~ ~~• MLE4204 Synthesis and Growth of Nanostructures#~~ ~~• MLE4205 Theory and Modelling of Materials Properties#~~ --- **Circular title:** Pharmacy: Pharmacy Programme - Changes in Major Requirements from Cohort 2016/17 onwards (PR4138, PR4197 & PR4198) **Circular no.:** BUS Circular No. 17, AY2018/19 (dated 21 Mar 2019) **To be changed for cohort number(s):** AY2016/17 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 130/243 **Current text:** Pass ~~PR4197 Pharmacy Internship I~~ ~~PR4198 Pharmacy Internship II~~ PR4196 Pharmacy Research Project and Scientific Communication **Revised text:**

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Pass PR4138 Pharmacy Professional Skills Development IV PR4197A Pharmacy Internship I PR4198A Pharmacy Internship II PR4196 Pharmacy Research Project and Scientific Communication --- **Circular title:** Physics: Proposed changes to the requirements of the Minor Programme in Physics (Removal of PC2020 from the second group of modules I, and the addition of PC2020 to substitute PC2131 E in the third group of modules) **Circular no.:** SFCC Circular No. 12, AY2018/19 (dated 19 Mar 2019) **To be changed for cohort number(s):** AY2017/18 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 163/243 **Current text:** 1. Any one from the following: a. PC1141 Introduction to Classical Mechanics b. PC1142 Introduction to Thermodynamics and Optics c. PC1143 Introduction to Electricity & Magnestism d. PC1431 Physics IE or PC1431X Physics IE 2. Any one from the following: a. PC1144 Introduction to Modern Physics b. PC1432/PC1432X Physics IIE c. PC2232 Physics for Electrical Engineers or PC2020 Electromagnetism for Electrical Engineers 3. Any four modules from the following of which at least two modules must be Level-3000 & above: a. PC2130 Quantum Mechanics I b. PC2131 Electricity and Magnetism I c. PC2132 Classical Mechanics

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			d. PC2134 Mathematical Methods in Physics I e. PC2230 Thermodynamics and Statistical Mechanics f. PC2193 Experimental Physics I g. PC3130 Quantum Mechanics II h. PC3193 Experimental Physics II i. ALL PC32XX and PC42XX modules **<u>Revised text:</u>** 1. Any one from the following: a. PC1141 Introduction to Classical Mechanics b. PC1142 Introduction to Thermodynamics and Optics c. PC1143 Introduction to Electricity & Magnestism d. PC1431 Physics IE or PC1431X Physics IE 2. Any one from the following: a. PC1144 Introduction to Modern Physics b. PC1432/PC1432X Physics IIE c. PC2232 Physics for Electrical Engineers ~~or PC2020 Electromagnetism for Electrical Engineers~~ 3. Any four modules from the following of which at least two modules must be Level-3000 & above: a. PC2130 Quantum Mechanics I b. PC2131 Electricity and Magnetism I c. PC2132 Classical Mechanics d. PC2134 Mathematical Methods in Physics I e. PC2230 Thermodynamics and Statistical Mechanics f. PC2193 Experimental Physics I g. PC3130 Quantum Mechanics II h. PC3193 Experimental Physics II i. ALL PC32XX and PC42XX modules --- **Circular title:** Pharmacy: Revision to the Minor Programme in Pharmaceutical Science (Add PR3117 as an alternative to PR3301) **Circular no.:** SFCC Circular No. 12, AY2018/19 (dated 19 Mar 2019)

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			To be changed for cohort number(s): AY2015/16 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 162/243 **Current text:** Essential modules: PR1110 Foundations for Medicinal Chemistry PR2114 Formulation and Technology I PR2115 Medicinal Chemistry for Drug Design PR3301 Pharmaceutical Dosage Forms **Revised text:** Essential modules: PR1110 Foundations for Medicinal Chemistry PR2114 Formulation and Technology I PR2115 Medicinal Chemistry for Drug Design Either PR3301 Pharmaceutical Dosage Forms or PR3117 Formulations & Technology II --- **Circular title:** Dean's Office: Proposals for the Undergraduate Professional Internship Programme Modules: a. Proposal for new module: XX3313 Undergraduate Professional Internship Programme Extended b. Proposed change to existing module : XX3312 Enhanced Undergraduate Professional Internship Programme (Revisions to title) **Circular no.:** SFCC Circular No. 13, AY2018/19 (dated 8 Apr 2019) **To be changed for cohort number(s):** AY2015/16 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 33/243 **Current text:** For more information, visit URL: http://science.nus.edu.sg/students/upip

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Revised text: For more information, visit URL: http://www.science.nus.edu.sg/industry/internships/284-industry/2568-upip-for-students --- **Circular title:** Mathematics: b. Proposed changes to requirements of the Minor in Financial Mathematics (FM) **Circular no.:** BUS Circular No. 24, AY2018/19 (dated 13 Jun 2019) **To be changed for cohort number(s):** AY2012/13 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 171/243 **Current text:** To be awarded a minor in Financial Mathematics, a student must pass at least 24 MC's from nonoverlapping modules of the following type: 1. Pass at least 8 MCs from MA1xxx, except MA1301/MA1301X; and 2. Pass MA2216/ST2131 or ST2334; and 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: 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 **Revised text:** To be awarded a minor in Financial Mathematics, a student must pass at least 24 MCs from non-overlapping modules of the following: 1. Pass at least 8 MCs from the following modules: a. MA1xxx, except MA1301/MA1301X;

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			b. CS1231/CS1231S; and 2. Pass MA2216/ST2131 or ST2334; and 3. Pass MA3269 and (QF3101 or FIN3101 [for BIZ students] or FIN3102/FIN3702* [for BIZ students]); and ST3131. The titles of the above modules are as listed below: CS1231/CS1231S Discrete Structures MA2216/ST2131 Probability MA3269 Mathematical Finance I QF3101 Investment Instruments: Theory and Computation FIN3101 Corporate Finance FIN3102/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. --- **Circular title:** Mathematics: c. Proposed changes to requirements of the Minor in Mathematics (MA) **Circular no.:** BUS Circular No. 24, AY2018/19 (dated 13 Jun 2019) **To be changed for cohort number(s):** AY2013/14 onwards **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf - Page 175/243 **Current text:** To qualify for a minor in Mathematics, a student should pass at least 24 MCs from non-overlapping modules of the following type: 1. Pass at least 8 MCs from the following modules: a. MA1xxx modules except MA1301/MA1301X; or b. CS1231 2. Pass any two MA2xxx modules 3. Pass any two MA3xxx or higher modules, ~~excluding MA3311 and MA3312~~

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Note that these ST and MA modules are crosslisted: ST2131 with MA2216, ST3236 with MA3238, and ST4238 with MA4251. **Revised text:** To qualify for a Minor in Mathematics, a student should pass at least 24 MCs from non-overlapping modules of the following type: 1. At least 8 MCs from the following modules: ○ MA1xxx modules except MA1301/MA1301X, OR ○ CS1231/CS1231S; and 2. Any two MA2xxx modules; and 3. Any two MA3xxx or higher modules, ~~MA3311 and MA3312~~ except those coded MA33XX. Note that these ST and MA modules are cross-listed: • ST2131 with MA2216 • ST3236 with MA3238 • ST4238 with MA4251
3.	26 Jul 2019	FoS	**Meeting title:** Minutes of Science Faculty Curriculum Committee Meeting held on Wednesday 24 February 2016, 1pm at S16 Level 9 Conference Room **Meeting no.:** SFCC Meeting no. 5, AY2015/16 (dated 24 Feb 2016) **To be changed for cohort number(s):** AY16/17 onwards (AY17/18 in this case) **Archived Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf (Page 34/243) **Current text:** Statistics Statistics (with specialisation in Biostatistics) Statistics (with specialisation in Finance and Business Statistics) **Revised text:** Statistics

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>Statistics (with specialisation in Biostatistics) (For Cohort 2015 and earlier)
Statistics (with specialisation in Data Science) (For Cohort 2016 onwards)
Statistics (with specialisation in Finance and Business Statistics)</td></tr>
<tr><td>4.</td><td>13 Mar 2020</td><td>FoS</td><td><u>Updates for Bulletin AY2017/18 (as of 13 March 2020)</u>

To be changed for cohort number(s): Cohort AY17/18 onwards

Link: Page 134/243 http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf

<u>Current text:</u>

<table>
<tr><th>SECOND MAJOR</th><th>PREREQUISITES</th></tr>
<tr><td>1. Chemistry</td><td>H2 pass in Chemistry or equivalent</td></tr>
<tr><td>2. Data Analytics</td><td>A very good pass in H2 Mathematics or equivalent. Existing students from cohort 2016/2017 or later may apply to read a Second Major in Data Analytics after completing CS1010 (or its equivalent), MA1101R (or its equivalent) and MA1102R (or its equivalent) with a B+ grade or above in each of these modules.</td></tr>
<tr><td>3. Life Sciences</td><td>H2 passes or equivalent in Biology, Chemistry AND either Mathematics or Physics</td></tr>
<tr><td>4. Mathematics</td><td>H2 pass in Mathematics or equivalent</td></tr>
<tr><td>5. Physics</td><td>H2 pass in Physics or equivalent</td></tr>
<tr><td>6. Statistics</td><td>H2 pass in Mathematics or equivalent</td></tr>
</table>

<u>Revised text:</u>

<table>
<tr><th>SECOND MAJOR</th><th>PREREQUISITES</th></tr>
<tr><td>1. Chemistry</td><td>H2 pass in Chemistry or equivalent</td></tr>
<tr><td>2. Data Analytics</td><td>A very good pass in H2 Mathematics or equivalent. Existing students from cohort 2016/2017 or later may apply to read a Second Major in</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Data Analytics after completing CS1010 (or its equivalent), MA1101R (or its equivalent) and MA1102R (or its equivalent) with a B+ grade or above in each of these modules.</td></tr>
<tr><td>3. Food Science</td><td>Good H2 pass in at least two science subjects; one of them should be Chemistry</td></tr>
<tr><td><s>3.</s> 4 Life Sciences</td><td>H2 passes or equivalent in Biology, Chemistry AND either Mathematics or Physics</td></tr>
<tr><td><s>4.</s> 5 Mathematics</td><td>H2 pass in Mathematics or equivalent</td></tr>
<tr><td><s>5.</s> 6 Physics</td><td>H2 pass in Physics or equivalent</td></tr>
<tr><td><s>6.</s> 7 Statistics</td><td>H2 pass in Mathematics or equivalent</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>14 May 2020</td><td>FoS</td><td>
<u>Updates for Archived Bulletin AY17/18</u>
Link: http://www.nus.edu.sg/registrar/info/nusbulletin/AY201718_FoS.pdf
http://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf
<hr>
Circular title: Faculty of Science: Computational Biology Programme – Changes in Major Requirement for B.Sc. (Hons.) in Computational Biology (ZB)
Circular no.: UCEP Circular 5, AY19/20

<u>Page 79 to 80 out of 243</u>

Current text:

Option A
CS2102 Database Systems
CS3103 Computer Networks Practice
CS3230 Design and Analysis of Algorithms
CS3240 Interaction Design
CS3241 Computer Graphics
CS3243 Introduction to Artificial Intelligence
CS3244 Machine Learning
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)

Level-4000 Essential		
ZB4199 Honours Project in Computational Biology	12	20
ZB4171 Advanced Topics in Bioinformatics	4	
LSM4241 Functional Genomics	4	

Option A
CS4220 Knowledge Discovery Methods in Bioinformatics
CS4221 Database Applications Design and Tuning
CS4231 Parallel and Distributed Algorithms
CS4243 Computer Vision and Pattern Recognition
CS4244 Knowledge Representation and Reasoning
CS4248 Natural Language Processing
CS4234 Optimisation Algorithms
CS4330 Combinatorial Methods in Bioinformatics

Option B
LSM4211 Toxicology
LSM4212 Pharmacogenetics and Drug Responses
LSM4213 System Neurobiology
LSM4221 Drug Discovery and Clinical Trials
LSM4222 Advanced Immunology
LSM4224 Free Radicals and Antioxidant Biology
LSM4226 Infection and Immunity
LSM4231 Structural Biology
LSM4232 Advanced Cell Biology
LSM4242 Protein Engineering

Unrestricted Elective Modules [4]	32 – 36

Revised text:

Option A
CS2102 Database Systems
CS3103 Computer Networks Practice

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
CS3230 Design and Analysis of Algorithms
CS3223 Database Systems Implementation
CS3240 Interaction Design
CS3241 Computer Graphics
CS3243 Introduction to Artificial Intelligence
CS3244 Machine Learning

<table>
<tr><td>Level-4000 Essential</td><td></td><td></td></tr>
<tr><td>ZB4199 Honours Project in Computational Biology OR ZB4299 Applied Project in Computational Biology</td><td>12</td><td rowspan="3">~~20~~

16</td></tr>
<tr><td>ZB4171 Advanced Topics in Bioinformatics</td><td>4</td></tr>
<tr><td>~~LSM4241 Functional Genomics~~</td><td>~~4~~</td></tr>
</table>

Option A
CS4220 Knowledge Discovery Methods in Bioinformatics
CS4221 Database Applications Design and Tuning
CS4231 Parallel and Distributed Algorithms
CS4224 Distributed Databases
CS4225 Big Data Systems for Data Science
CS4243 Computer Vision and Pattern Recognition
CS4244 Knowledge Representation and Reasoning
CS4248 Natural Language Processing
CS4234 Optimisation Algorithms
CS4330 Combinatorial Methods in Bioinformatics

Option B
LSM4211 Toxicology
LSM4212 Pharmacogenetics and Drug Responses
LSM4213 System Neurobiology
LSM4221 Drug Discovery and Clinical Trials
LSM4222 Advanced Immunology
LSM4224 Free Radicals and Antioxidant Biology
LSM4226 Infection and Immunity
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4241 Functional Genomics LSM4242 Protein Engineering Unrestricted Elective Modules [4] | ~~32 – 36~~ 36-40 **Circular title:** Proposed Inclusion of ST4299 (Applied Project) as an Alternative to ST4199 (Honours Project) in the Statistics Major **Circular no.:** SFCC Circular No. 19, AY2018/19 **Page 124 out of 243** **Current and revised text:** Pass - ST4199 Honours Project in Statistics *or* ST4299 Applied Project in Statistics - ST4231 Computer Intensive Statistical Methods - ST4233 Linear Models - Two other modules from ST4xxx modules - One additional module from ST4xxx, ST5xxx or List B modules **Circular title:** Faculty of Science: Department of Chemistry – Revision of Requirements for Minor in Analytical Chemistry Programme **Circular no.:** BUS Cir05, AY19/20 **Page 155 out of 243**

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Current text: To be awarded a minor in Analytical Chemistry, a student must pass all the following six modules: ~~1. CM1401 and CM1111 Chemistry for Life Sciences and Inorganic Chemistry 1 OR~~ ~~2. CM1402 and CM1191 General Chemistry and Experiments in Chemistry 1~~ ~~3. CM2101 Physical Chemistry 2~~ ~~4. CM2142 Analytical Chemistry 1 OR CM2192 Experiments in Chemistry 2~~ ~~5. CM3242 Instrumental Analysis II~~ ~~6. CM3295 Selected Experiments in Analytical Chemistry~~ **Revised text:** To be awarded a minor in Analytical Chemistry, a student must pass all the following six modules: 1. CM1191 Experiments in Chemistry 1 2. CM1111 Inorganic Chemistry 1 **or** CM1121 Organic Chemistry 1 **or** CM1131 Physical Chemistry 1 **or** CM1401 Chemistry for Life Sciences **or** CM1402 General Chemistry **or** CM1501 Organic Chemistry for Engineers **or** CM1502 General and Physical Chemistry for Engineers 3. CM2192 Experiments in Chemistry 3 or CM2142 Analytical Chemistry 1 4. CM2101 Physical Chemistry 2 **or** CM3241 Instrumental Analysis I 5. CM3242 Instrumental Analysis II 6. CM3292 Advanced Experiments in Analytical & Physical Chemistry **or** CM3295 Selected Experiments in Analytical Chemistry --- **Circular title:** FoS: Department of Biological Sciences – Addition of Elective Options for Minor Programme in Aquatic Ecology **Circular no.:** BUS Cir09, AY19/20 **Page 165** **Current text:** To be awarded a minor in Aquatic Ecology, a student must pass the six modules as set out below: 1. LSM2251 Ecology and Environment 2. LSM3254 Ecology of Aquatic Environments

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			3. GE2229 Water and Environment 4. SP3203 Aquatic Ecology Research 5. Choose 2 from the following elective modules: [For students reading Life Sciences Major, please select at least one non-LSM prefixed module.] • 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 • LSM2252 Biodiversity • LSM4257 Aquatic Vertebrate Diversity • LSM4261 Marine Biology • LSM4264 Freshwater Biology This Minor is not awarded with a Bachelor of Environmental Studies (BES) degree from Cohort AY2016/17 and onwards. **Revised text:** To be awarded a minor in Aquatic Ecology, a student must pass the six modules as set out below: 1. LSM2251 Ecology and Environment 2. LSM3254 Ecology of Aquatic Environments 3. GE2229 Water and Environment 4. SP3203 Aquatic Ecology Research 5. Choose 2 from the following elective modules: [For students reading Life Sciences Major, please select at least one non-LSM prefixed module.] 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 GE3246 Environmental Pollution

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			o LSM2253 Applied Data Analysis in Ecology and Evolution o LSM2252 Biodiversity o LSM4257 Aquatic Vertebrate Diversity o LSM4260 Plankton Ecology o LSM4261 Marine Biology o LSM4264 Freshwater Biology o LSM4266 Aquatic Invertebrate Diversity This Minor is not awarded with a Bachelor of Environmental Studies (BES) degree from Cohort AY2016/17 and onwards. --- **Circular title:** FoS: Department of Physics – Proposal to Change the Curriculum for the Minor in Medical Physics **Circular no.:** BUS Cir15, AY19/20 **Page 156** **Current text:** The Medical Physics minor programme will consist of the following set of common core modules (12 MCs): 1. GEH1032 Modern Technology in Medicine and Health 2. PC3232 Nuclear & Particle Physics (for physics majors) or PC3232B Applied Nuclear Physics 3. PC3294 Radiation Lab Students in the Medical Physics minor programme are also required to read at least 12 MCs of modules from the following set of electives: Module (4 MC each) 1. LSM2212 Human Anatomy 2. LSM1106 Molecular Cell Biology 3. LSM1104 or LSM2231 General Physiology 4. LSM1401 Fundamentals of Biochemistry 5. LSM2103 or LSM2233 Cell Biology

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			6. LSM4243 Tumour Biology 7. LSM3223 Immunology 8. LSM3243 Molecular Biophysics 9. EE4603 Biomedical Imaging Systems **Revised text:** The Medical Physics minor programme will consist of the following set of common core modules (12 MCs): 1. GEH1032 Modern Technology in Medicine and Health 2. ~~PC3232 Nuclear & Particle Physics (for physics majors) or PC3232B Applied Nuclear Physics~~ PC3295 Radiation for Imaging and Therapy in Medicine 3. PC3294 Radiation Lab Students in the Medical Physics minor programme are also required to read at least 12 MCs of modules from the following set of electives modules (4 MC each): 1. LSM2212 Human Anatomy 2. LSM1106 Molecular Cell Biology 3. LSM1104 or LSM2231 General Physiology 4. LSM1401 Fundamentals of Biochemistry 5. LSM2103 or LSM2233 Cell Biology 6. LSM4243 Tumour Biology 7. LSM3223 Immunology 8. LSM3243 Molecular Biophysics 9. EE4603 Biomedical Imaging Systems Please note that with effect from Semester 1, AY2020/21: • Students who have not read PC3232 or PC3232B will now read PC3295 to satisfy the Minor curriculum requirement in lieu of PC3232/PC3232B, before going on to read PC3294. • Students who have already read PC3232 or PC3232B are considered to have fulfilled the requirement of PC3295 under the new Minor requirements and may proceed to read the module PC3294.
6.	4 Jun 2020	FoS	**Updates for Archived Bulletin AY17/18** **Link:** http://www.nus.edu.sg/nusbulletin/archives/ay201718/ http://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Circular title: FoS: Department of Pharmacy – Major Revision to the Minor Programme in Pharmaceutical Science **Circular no.:** Senate Circular No. 14 AY2019-20 **Page 162 of 243** **Current text:** **Curriculum Structure and Requirements** Essential modules: PR1110 Foundations for Medicinal Chemistry PR2114 Formulation and Technology I PR2115 Medicinal Chemistry for Drug Design PR3301 Pharmaceutical Dosage Forms Choose TWO from the following elective modules: PR1301 Complementary Medicine and Health PR4205 Bioorganic Principles of Medicinal Chemistry PR4206 Industrial Pharmacy CN4241R Engineering Principles for Drug Delivery **Revised text:** Essential modules: PR1110 Foundations for Medicinal Chemistry or PHS1110 Foundation for Medicinal and Synthetic Chemistry PR2114 Formulation and Technology I or PHS1114 Principles of Pharmaceutical Formulations I PR2115 Medicinal Chemistry for Drug Design or PHS2115 Basic Principles of Drug Design and Development PR3301 Pharmaceutical Dosage Forms or PR3117 Formulations & Technology II or PHS2117 Principles of Pharmaceutical Formulations II Choose TWO from the following elective modules: PR1301 Complementary Medicine and Health

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>PR2143 Pharmaceutical Analysis for Quality Assurance or PHS2143 Analytical Techniques and Pharmaceutical Applications
PR2202 Cosmetics and Perfumes
PR3204 Medicinal Natural Products
PR4205 Bioorganic Principles of Medicinal Chemistry
PR4206 Industrial Pharmacy
CN4241R Engineering Principles for Drug Delivery
SP4263 Forensic Toxicology and Poisons</td></tr>
<tr><td>7.</td><td>30 Jul 2020</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>

Circular title: Faculty of Science: Second Major in Mathematics
Circular no.: Bus Circular 26, AY19/20

Link: http://www.nus.edu.sg/nusbulletin/archives/ay201718/ Page: 145

<table>
<tr><th>MODULE LEVEL</th><th>SECOND MAJOR REQUIREMENTS</th><th>CUMULATIVE MAJOR MCS</th></tr>
<tr><td>Level-2000
(20 – 23 MCs)</td><td>Pass
MA2101/ MA2101S Linear Algebra II
MA2108/ MA2108S Mathematical Analysis I
MA2216/ ST2131 or ST2334 Probability and Statistics
One additional module from List II, III, IV</td><td>32 – 37</td></tr>
</table>
</td></tr>
<tr><td>8.</td><td>17 Aug 2020</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: http://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201819_FoS.pdf (Page: 227/ 293)

Circular title: Faculty of Science: Revision to Computational Thinking Requirement for Chemistry, Food Science and Technology, Life Sciences, Pharmaceutical Science and Physics Majors</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
Circular no.: Bus Circular 01 AY20/21
<hr>
3.3.1.7 Computational Thinking Requirement

Revised text:
<table>
<tr><td>Life Sciences, Physics</td><td>Option 1: COS2000 – Computational Thinking for Scientists
or
Option 2: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology
or
Option 3: CS50 Introduction to Computer Science DYOM edX MOOCs+</td></tr>
<tr><td>Chemistry, Food Science & Technology</td><td>Option 1: COS2000 – Computational Thinking for Scientists
or
Option 2: CM3267 – Computational Thinking and Programming in Chemistry*
or
Option 3: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology
or
Option 4: CS50 Introduction to Computer Science DYOM edX MOOCs+</td></tr>
</table>
Notes: (to add)

As CS50’s Introduction to Computer Science from EdX is not equivalent to CS1010S (or its variant), CS50’s will not serve as pre-requisite for higher computing modules. Also, there is a two-way preclusion between CS1010S (or its variant) and CS50’s. Students who are required to read CS1010S (or its variant) as part of their majors/minors are to take CS1010S (or its variant) instead of CS50’s. For students who have taken CS50’s but requires to read CS1010S (or its variant) as part of their majors/minors, please write in to SOC to be allowed to take CS1010S (or its variant) and credit will be recognised only for CS1010S (or its variant) but not CS50’s.

</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
9.	9 Oct 2020	FoS	**Updates for Bulletin AY17/18** **Link:** http://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf Circular title: Faculty of Science: Revision to Computational Thinking Requirement for Chemistry, Food Science and Technology, Life Sciences, Pharmaceutical Science and Physics Majors Circular no.: Bus Circular 01 AY20/21 Page 304/304 **Revised text:** **3.3.1.7 Computational Thinking Requirement** Notes: (to add) • ~~As CS50's Introduction to Computer Science from EdX is not equivalent to CS1010S (or its variant), CS50's will not serve as pre-requisite for higher computing modules. Also, there is a two-way preclusion between CS1010S (or its variant) and CS50's. Students who are required to read CS1010S (or its variant) as part of their majors/minors are to take CS1010S (or its variant) instead of CS50's. For students who have taken CS50's but requires to read CS1010S (or its variant) as part of their majors/minors, please write in to SOC to be allowed to take CS1010S (or its variant) and credit will be recognised only for CS1010S (or its variant) but not CS50's.~~ • Note: As CS50 Introduction to Computer Science from EdX is not equivalent to CS1010S (or its variant), CS50 will not serve as pre-requisite for higher computing modules. Also, there is a one-way preclusion in place, where students who have read CS50 will be precluded from reading CS1010S. Students who are required to read CS1010S (or its variant) as part of their majors/second majors/minors are to take CS1010S (or its variant) instead of CS50. For students who have taken CS50 but are required to read CS1010S (or its variant) as part of their majors/second majors/minors, please write in to SOC to be allowed to take CS1010S (or its variant) and CS50 will be counted towards the UE.
10.	2 Nov 2020	FoS	**Updates for Bulletin AY17/18** **Link:** http://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf Circular title: Faculty of Science: Revision to Computational Thinking Requirement for Chemistry, Food Science and Technology, Life Sciences, Pharmaceutical Science and Physics Majors

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Circular no.: Bus Circular 01 AY20/21 Page: 304/ 305 3.3.1.7 Computational Thinking Requirement **Revised text:** Notes: (to add in red) • As CS50's Introduction to Computer Science from EdX is not equivalent to CS1010S (or its variant), CS50's will not serve as pre-requisite for higher computing modules. Also, there is a two-way preclusion between CS1010S (or its variant) and CS50's. Students who are required to read CS1010S (or its variant) as part of their majors/minors are to take CS1010S (or its variant) instead of CS50's. For students who have taken CS50's but requires to read CS1010S (or its variant) as part of their majors/minors, please write in to SOC to be allowed to take CS1010S (or its variant) and credit will be recognised only for CS1010S (or its variant) but not CS50's. Please also note that the number of credits transferred for CS50 is subject to the maximum 8 MCs allowed for DYOM. For example, if a student has already completed 5 MCs worth of edX MOOCs, only 3 MCs (and not 5 MCs) can be counted for CS50.
11.	24 Nov 2020	FoS	**Updates for Bulletin AY2017/18** **Link:** http://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201718_FoS.pdf Circular title: FoS: Department of Food Science and Technology (FST) – Proposal to Revise the List of Elective Modules for the Major in Food Science and Technology Circular no.: BUS Circular 09 AY20/21 Page 85 of 243 3.3.3.3 Food Science and Technology **Revised text (additions/changes in red):**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="3">(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Pass

• FST4199 Honours Project in Food Science & Technology <u>or</u>
FST4299 Applied Project in Food Science & Technology
• FST4102 Advanced Food Processing Technologies
• FST4103 Food Colloids and Components Science

At least 8 MCs from following:

• FST4201 Current Topics in Food Science and Technology
• FST4202 Nutritional Biochemistry
• FST4203 Food Forensics
• CM4241 Trace Analysis
• CM4242 Advanced Analytical Techniques
• ~~CM4267 Current Topics in Analytical Techniques~~
• FST5201 Rheology and Textural Properties of Biomaterials
• FST5202A ~~Advanced Food Fermentation~~ Modern Food Fermentation
• FST5203A ~~Advanced Food Microbiology and Safety~~ Advanced Food Microbiological Analysis and Food Safety
• FST5301A ~~Evidence-based Functional Foods~~ Scientific Principles of Nutraceuticals
• FST5303A ~~Modern Human Nutrition~~ Science in Clinical Nutrition
• FST5225 Advanced Current Topics in Food Science
• FST5226 Advanced Current Topics in Food Science II
• FST5227 Advanced Current Topics in Food Science III
• ~~CM5241 Modern Analytical Techniques~~</td><td>4000

(32 MCs)</td><td>96</td></tr>
<tr><td>12.</td><td>18 Feb 2021</td><td>FoS</td><td colspan="3"><u>FoS: Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201718_FoS.pdf</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
Circular no. and title: SFCC Circular 5 AY20/21 FoS: Biological Sciences - Minor Programme in Aquatic Ecology – Conversion from Restricted to Open Minor

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3.4.3 Minor Programmes

Revised text (additions/changes in red):

<table>
<tr><th>Minor</th><th>Pre-requisites</th></tr>
<tr><td>2. Aquatic Ecology</td><td>Open to students from all disciplines, except those who are reading the Bachelor of Environmental Studies degree from Academic Year 2016/2017 cohort and onwards ~~for application and subject to Departmental approval~~</td></tr>
</table>

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3.4.3.2 Minor in Aquatic Ecology

Revised text (additions/changes in red):

~~This Minor is not awarded with a Bachelor of Environmental Studies degree from Cohort AY2016/17 onwards.~~

~~Application is required to read this minor. For more information, please refer to http://www.lifesciences.nus.edu.sg/info/AE_Minor.pdf.~~

Application
This is an open Minor and is available to undergraduate students from all disciplines, except those who are reading the Bachelor of Environmental Studies (BES) degree from Cohorts AY2016/17 onwards. The declaration to join the Minor should be made by the start of the fifth semester of the undergraduate candidature.
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Declaration is via EduRec. Please refer to the Academic Plan Application/Declaration (APAD) website for more details. For more information, please refer to: https://www.dbs.nus.edu.sg/education/minor-in-aquatic-ecology/
13.	23 Feb 2021	FoS	**Updates for Bulletin AY17/18** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf Circular no. and title: BUS Circular 13 AY20/21 Faculty of Science: Department of Pharmacy – Revision to the Minor Programme in Pharmaceutical Science for Inflight Minor Students Page 332 of 338 3.4.3.13 Minor in Pharmaceutical Science **Revised text (additions/changes in red):** Essential modules: PR1110 Foundations for Medicinal Chemistry or PHS1110 Foundation for Medicinal and Synthetic Chemistry or PHS1101 Billion Dollar Pill – Bench to Bedside Drug Development PR2114 Formulation and Technology I or PHS1114 Principles of Pharmaceutical Formulations I or PHS2105 Principles of Pharmaceutical Formulations I PR2115 Medicinal Chemistry for Drug Design or PHS2115 Basic Principles of Drug Design and Development or PHS2102 Physicochemical Principles of Drug Action *{placeholder title}* PR3301 Pharmaceutical Dosage Forms or PR3117 Formulations & Technology II or PHS2117 Principles of Pharmaceutical Formulations II or PR5304 Fundamental Topics in Pharmaceutical Science Choose TWO from the following elective modules: PR1301 Complementary Medicine and Health PR2143 Pharmaceutical Analysis for Quality Assurance or PHS2143 Analytical Techniques and Pharmaceutical Applications or PHS2103 Rational Drug Design and Molecular Characterization {placeholder title} PR2202 Cosmetics and Perfumes PR3204 Medicinal Natural Products

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>PR4205 Bioorganic Principles of Medicinal Chemistry
PR4206 Industrial Pharmacy
CN4241R Engineering Principles for Drug Delivery
SP4263 Forensic Toxicology and Poisons</td></tr>
<tr><td>14.</td><td>11 Mar 2021</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS: Department of Food Science and Technology (FST) – Proposal to Revise the List of Elective Modules for the Major in Food Science and Technology

Circular no.: BUS Circular 15 AY20/21

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3.3.3.3 Food Science and Technology

Revised text (additions/changes in red):

<table>
<tr><td>4000

(32 MCs)</td><td>Pass

• FST4199 Honours Project in Food Science & Technology <u>or</u>
FST4299 Applied Project in Food Science & Technology
• FST4102 Advanced Food Processing Technologies
• FST4103 Food Colloids and Components Science

At least 8 MCs from following:

• FST4201 Current Topics in Food Science and Technology
• FST4202 Nutritional Biochemistry
• FST4203 Food Forensics</td><td></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>
• CM4241 Trace Analysis
• CM4242 Advanced Analytical Techniques
• FST5201 Rheology and Textural Properties of Biomaterials
• FST5202/FST5202A Advanced Food Fermentation/Modern Food Fermentation
• FST5203/FST5203A Advanced Food Microbiology and Safety/Advanced Food Microbiological Analysis and Food Safety
• FST5301/FST5301A Evidence-based Functional Foods/Scientific Principles of Nutraceuticals
• FST5303/FST5303A Modern Human Nutrition/Science in Clinical Nutrition
• FST5225 Advanced Current Topics in Food Science
• FST5226 Advanced Current Topics in Food Science II
• FST5227 Advanced Current Topics in Food Science III
</td><td>96</td></tr>
</table>
</td></tr>
<tr><td>15.</td><td>11 May 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS: Mathematics – Proposal for Changes to Requirements of Major in Mathematics and in Applied Mathematics, and Second Major in Mathematics for Pre-CHS Cohorts

Circular no.: BUS Circular 20 AY20/21

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3.4.2.4 Second Major in Mathematics

Revised text (additions/changes in red):

To be awarded a BSc with 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</th></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th></th><th></th><th>Major MCs</th></tr>
<tr><td>1000
(16-18 MCs)
(*12 MCs)</td><td>Pass
MA1100/MA1100T Fundamental Concepts of Mathematics/Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures
MA1101R/MA2001 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/MA2002 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</td><td>16-18
(*12)</td></tr>
<tr><td>2000
(16-19 MCs)
(*20-23 MCs)</td><td>Pass
MA2101/MA2101S Linear Algebra II
MA2108/MA2108S Mathematical Analysis I
MA2216/MA2116/ST2131 Probability or ST2334 Probability and Statistics
One additional module from List II, III, IV</td><td>32-37</td></tr>
<tr><td>3000
(16-19 MCs)</td><td>Pass
MA3110/MA3110S/MA3210 Mathematical Analysis II
MA3111/MA3111S/MA3211/MA3211S Complex Analysis I
Two additional modules from List III, IV</td><td>48-56</td></tr>
</table>
(*adjusted Level and Cumulative Major MCs respectively if taking MA2104 or MA2501 instead of MA1104)

<table>
<tr><th>List II</th></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			• All MA modules at level 2000, except those coded MA23XX • PC2130 Quantum Mechanics I • PC2132 Classical Mechanics • ST2132 Mathematical Statistics • EC2101 Microeconomic Analysis I **List III** • All MA modules at level 3000, except those coded MA33XX • BSE3703 Econometrics for Business I • CS3230 Design & Analysis of Algorithms • CS3231 Theory of Computation • CS3234 Logic and Formal Systems • DSA3102 Essential Data Analytics Tools: Convex Optimisation • EC3101 Microeconomic Analysis II • EC3303 Econometrics I • PC3130 Quantum Mechanics II • PC3236 Computational Methods in Physics • PC3238 Fluid Dynamics • ST3131 Regression Analysis • ST3236 Stochastic Processes I **List IV** • All MA modules at level 4000 or higher • CS4232 Theory of Computation • CS4234 Optimisation Algorithms • CS4236 Cryptography Theory and Practice • CS5230 Computational Complexity • CS5237 Computational Geometry and Applications • DSA4211 High-Dimensional Statistical Analysis • DSA4212 Optimisation for Large-Scale Data-Driven Inference • EC4101 / EC4301 Microeconomic Analysis III • EC5104 / EC5104R Mathematical Economics

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			• PC4248 Relativity • PC4274 Mathematical Methods in Physics III • PC5274 Advanced Mathematical Methods in Physics • ST4238 Stochastic Processes II • ST4245 Statistical Methods for Finance
16.	11 May 2021	FoS	**Updates for Bulletin AY17/18** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf Circular title: FoS: Biological Sciences – Revision to Pre-CHS Forensic Science Minor Requirements for Cohorts AY2018/19 and earlier Circular no.: BUS Circular 20 AY20/21 Page 302 of 340 3.4.3.6 Minor in Forensic Science **Revised text (additions/changes in red):** **Essential Modules – Pass the following 3 modules (3 x 4MC = 12MC):** FSC2101/LSM1306 Forensic Science FSC3101/SP3202 Evidence in Forensic Science FSC4208/CM3301 Advanced Forensic Science **Elective Modules – Pass 12MCs of the following modules, including:** a) A maximum of 4MC from Level 1000 modules in the list b) A minimum of 4MC from Level 4000 modules in the list c) Up to 4 MC can be replaced with FSC52xx modules

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			FSC4201/SP4261 Articulating Probability and Statistics in Court FSC4202/SP4262 Forensic Human Identification FSC4203/SP4263 Forensic Toxicology and Poisons FSC4204/SP4264 Criminalistics: Evidence and Proof [This is a 2MC module. Please complete an equivalent of 12 MC of elective modules for the purpose of Minor fulfilment.] FSC4205/SP4265 Criminalistics: Forgery Exposé with Forensic Science [This is a 2MC module. Please complete an equivalent of 12 MC of elective modules for the purpose of Minor fulfilment.] FSC4206/LL4362V Advanced Criminal Litigation – Forensics on Trial [5MC] FSC4207/SP4266 Forensic Entomology CM2101 Physical Chemistry 2 or CM3131 Applications of Physical Chemistry CM3242 Instrumental Analysis II LSM2105/LSM1102 Molecular Genetics LSM3211 Fundamental Pharmacology PC1141 Introduction to Classical Mechanics or PC1431 Physics IE PR1110/A Foundations in Medicinal Chemistry PR3116 Concepts in Pharmacokinetics & Biopharmaceutics ST2334 Probability and Statistics; OR MA2116/MA2216/ST2131 Probability CM/FST/LSM/MA/PC/PR/ST/ZB3288 Advanced UROPS I (Forensic-Science related; subject to approval of Minor programme coordinator)
17.	11 May 2021	FoS	**Updates for Bulletin AY17/18** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201718_FoS.pdf Circular title: FoS: Mathematics – Proposal for Changes to Requirements of Major in Mathematics and in Applied Mathematics, and Second Major in Mathematics for Pre-CHS Cohorts Circular no.: BUS Circular 20 AY20/21 Page 101 of 243 3.3.3.6 Mathematics and Applied Mathematics **Revised text (additions/changes in red):**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>

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

<table>
<tr><th>Module Level</th><th>Major Requirements</th><th>Level MCs</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000</td><td>Pass all the following modules
• MA1100/MA1100T Fundamental Concepts of Mathematics/Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures
• MA1101R/MA2001 Linear Algebra I
• MA1102R/MA2002 Calculus
• CS1010/CS1010E/CS1010S/CS1010X /CS1101S* Programming Methodology

*CS1101S (5MCs for AY2017/18; 4 MCs from AY2018/19) may be read as an alternative to CS1010% (4MCs) to facilitate relevant programmes, e.g. Double Degree Programme with School of Computing. Registration for this module is subject to host availability.</td><td>16</td><td>16</td></tr>
<tr><td>2000</td><td>Pass all the following modules
• MA2101/MA2101S Linear Algebra II
• MA2014 Multivariable Calculus
• MA2108/MA2108S Mathematical Analysis I
• MA2202/MA2202S Algebra I
• MA2216/MA2116/ST2131 Probability
• One additional module from List II, III, IV</td><td>24-28</td><td>40-44</td></tr>
<tr><td>3000</td><td>Pass all the following modules
• MA3110/MA3110S/MA3210 Mathematical Analysis II
• MA3111/MA3111S/MA3211/MA3211S Complex Analysis I
• Two additional modules from list MA3
• One additional module from List III, IV</td><td>20-23</td><td>60-66</td></tr>
<tr><td>4000</td><td>Pass MA4199 Honours Project in Mathematics</td><td>32-33</td><td>92-98</td></tr>
</table>

</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)

	Pass four modules from List MA4 Pass one additional module from List IV		
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Mathematics		

List II

- All MA modules at level 2000, except those coded MA23XX
- PC2130 Quantum Mechanics I
- PC2132 Classical Mechanics
- ST2132 Mathematical Statistics
- EC2101 Microeconomic Analysis I

List III

- All MA modules at level 3000, except those coded MA33XX
- BSE3703 Econometrics for Business I
- CS3230 Design & Analysis of Algorithms
- CS3231 Theory of Computation
- CS3234 Logic and Formal Systems
- DSA3102 Essential Data Analytics Tools: Convex Optimisation
- EC3101 Microeconomic Analysis II
- EC3303 Econometrics I
- PC3130 Quantum Mechanics II
- PC3236 Computational Methods in Physics
- PC3238 Fluid Dynamics
- ST3131 Regression Analysis
- ST3236 Stochastic Processes I

List IV

- All MA modules at level 4000 or higher
- CS4232 Theory of Computation
- CS4234 Optimisation Algorithms

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			• CS4236 Cryptography Theory and Practice • CS5230 Computational Complexity • CS5237 Computational Geometry and Applications • DSA4211 High-Dimensional Statistical Analysis • DSA4212 Optimisation for Large-Scale Data-Driven Inference • EC4301 Microeconomic Analysis III • EC5104 / EC5104R Mathematical Economics • PC4248 Relativity • PC4274 Mathematical Methods in Physics III • PC5274 Advanced Mathematical Methods in Physics • ST4238 Stochastic Processes II • ST4245 Statistical Methods for Finance **List MA3** • MA3201 Algebra II • MA3205 Set Theory • MA3209 Mathematical Analysis III/Metric and Topological Spaces • MA3220 Ordinary Differential Equations • MA3265 Introduction to Number Theory • MA3266 Introduction to Fourier Analysis **List MA4** • MA4203 Galois Theory • MA4207 Mathematical Logic • MA4211 Functional Analysis • MA4221 Partial Differential Equations • MA4247 Complex Analysis II • MA4262 Measure and Integration • MA4266 Topology • MA4271 Differential Geometry of Curves and Surfaces

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>

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

I. BSc or BSc (Hons) with major in Applied Mathematics

<table>
<tr><th>Module Level</th><th>Major Requirements</th><th>Level MCs</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000</td><td>1. Pass all the following modules:
• MA1100/MA1100T Fundamental Concepts of Mathematics/Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures
• MA1101R/MA2001 Linear Algebra I
• MA1102R/MA2002 Calculus
• CS1010/CS1010E/CS1010S/CS1010X/CS1101S* Programming Methodology

*CS1101S (5MCs for AY2017/18; 4 MCs from AY2018/19) may be read as an alternative to CS1010% (4MCs) to facilitate relevant programmes, e.g. Double Degree Programme with School of Computing. Registration for this module is subject to host availability.</td><td>16</td><td>16</td></tr>
<tr><td>2000</td><td>2. Pass all the following modules:
• MA2101/MA2101S Linear Algebra II
• MA2104 Multivariable Calculus
• MA2108/MA2108S Mathematical Analysis I
• MA2213 Numerical Analysis I
• MA2216/MA2116/ST2131 Probability
3. Pass one additional module from List II, III, IV</td><td>24-27</td><td>40-43</td></tr>
<tr><td>3000</td><td>4. Pass all the following modules:</td><td>20-23</td><td>60-66</td></tr>
</table>

</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)

	• MA3110/MA3110S/MA3210 Mathematical Analysis II • MA3111/MA3111S/MA3211/MA3211S Complex Analysis I 5. Pass two modules from List AM3 6. Pass one additional module from List III, IV		
4000	7. Pass MA4199 Honours Project in Mathematics 8. Pass four modules from List AM4 9. Pass one additional module from List IV	32-33	92-98
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics		

To be awarded a B.Sc.(Hons.) with primary major in Applied Mathematics with **Specialisation in Mathematical Modelling and Data Analytics**, in addition to the University and Faculty requirements, a candidate must satisfy the following:

Module Level	Major Requirements	Level MCs	Cumulative Major MCs
1000	1. Pass all the following modules: • MA1100/MA1100T Fundamental Concepts of Mathematics/Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures • MA1101R/MA2001 Linear Algebra I • MA1102R/MA2002 Calculus • CS1010/CS1010E/CS1010S/CS1010X/CS1101S* Programming Methodology *CS1101S (5MCs for AY2017/18; 4 MCs from AY2018/19) may be read as an alternative to CS1010% (4MCs) to facilitate relevant programmes, e.g. Double Degree Programme with School of Computing. Registration for this module is subject to host availability.	16	16
2000	2. Pass all the following modules:	24-27	40-43

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)

	• MA2101/MA2101S Linear Algebra II • MA2104 Multivariable Calculus • MA2108/MA2108S Mathematical Analysis I • MA2213 Numerical Analysis I • MA2216/MA2116/ST2131 Probability • Pass one additional module from List II, III, IV		
3000	3. Pass all the following modules: • MA3110/MA3110S/MA3210 Mathematical Analysis II • MA3111/MA3111S/MA3211/MA3211S Complex Analysis I 4. Pass two modules from List AM3-MMDA 5. Pass one additional module from List III, IV	20-23	60-66
4000	6. Pass MA4199 Honours Project in Mathematics 7. Pass four modules from List AM4-MMDA 8. Pass one additional module from List IV	32-33	92-98
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics		

To be awarded a B.Sc.(Hons.) with primary major in Applied Mathematics with **Specialisation in Operations Research and Financial Mathematics**, in addition to the University and Faculty requirements, a candidate must satisfy the following:

Module Level	Major Requirements	Level MCs	Cumulative Major MCs
1000	1. Pass all the following modules: • MA1100/MA1100T Fundamental Concepts of Mathematics/Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures • MA1101R/MA2001 Linear Algebra I • MA1102R/MA2002 Calculus • CS1010/CS1010E/CS1010S/CS1010X/CS1101S*	16	16

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)

	Programming Methodology *CS1101S (5MCs for AY2017/18; 4 MCs from AY2018/19) may be read as an alternative to CS1010% (4MCs) to facilitate relevant programmes, e.g. Double Degree Programme with School of Computing. Registration for this module is subject to host availability.		
2000	2. Pass all the following modules: • MA2101/MA2101S Linear Algebra II • MA2104 Multivariable Calculus • MA2108/MA2108S Mathematical Analysis I • MA2213 Numerical Analysis I • MA2216/MA2116/ST2131 Probability • Pass one additional module from List II, III, IV	24-27	40-43
3000	3. Pass all the following modules: • MA3110/MA3110S/MA3210 Mathematical Analysis II • MA3111/MA3111S/MA3211/MA3211S Complex Analysis I 4. Pass two modules from List AM3-ORFM 5. Pass one additional module from List III, IV	20-23	60-66
4000	6. Pass MA4199 Honours Project in Mathematics 7. Pass four modules from List AM4-ORFM 8. Pass one additional module from List IV	32-33	92-98
UROPS	At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics		
List II			
• All MA modules at level 2000, except those coded MA23XX • PC2130 Quantum Mechanics I • PC2132 Classical Mechanics • ST2132 Mathematical Statistics • EC2101 Microeconomic Analysis I			
List III			

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			• All MA modules at level 3000, except those coded MA33XX • BSE3703 Econometrics for Business I • CS3230 Design & Analysis of Algorithms • CS3231 Theory of Computation • CS3234 Logic and Formal Systems • DSA3102 Essential Data Analytics Tools: Convex Optimisation • EC3101 Microeconomic Analysis II • EC3303 Econometrics I • PC3130 Quantum Mechanics II • PC3236 Computational Methods in Physics • PC3238 Fluid Dynamics • ST3131 Regression Analysis • ST3236 Stochastic Processes I **List IV** • All MA modules at level 4000 or higher • CS4232 Theory of Computation • CS4234 Optimisation Algorithms • CS4236 Cryptography Theory and Practice • CS5230 Computational Complexity • CS5237 Computational Geometry and Applications • DSA4211 High-Dimensional Statistical Analysis • DSA4212 Optimisation for Large-Scale Data-Driven Inference • EC4301 Microeconomic Analysis III • EC5104/EC5104R Mathematical Economics • PC4248 Relativity • PC4274 Mathematical Methods in Physics III • PC5274 Advanced Mathematical Methods in Physics • ST4238 Stochastic Processes II • ST4245 Statistical Methods for Finance **List AM3** **List AM3 consists of the following 3 baskets AM3-General, AM3-MMDA, AM3-ORFM.**

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			AM3-General • MA3209 Mathematical Analysis III/Metric and Topological Spaces • MA3218 Applied Algebra • MA3220 Ordinary Differential Equations **AM3-MMDA** • MA3227 Numerical Analysis II • MA3233 Combinatorics and Graph II • MA3264 Mathematical Modelling • ST3131 Regression Analysis **AM3-ORFM** • MA3236 Nonlinear Programming • MA3252 Linear and Network Optimization • MA3269 Mathematical Finance I • ST3131 Regression Analysis **List AM4** **List AM4 consists of the following 3 baskets AM4-General, AM4-MMDA, AM4-ORFM.** **AM4-General** • MA4211 Functional Analysis • MA4221 Partial Differential Equations • MA4235 Topics in Graph Theory • MA4261 Coding and Cryptography **AM4-MMDA** • MA4229 Approximation Theory/Fourier Analysis and Approximation • MA4230 Matrix Computation • MA4255 Numerical Methods in Differential Equations • MA4268 Mathematics for Visual Data Processing • MA4270 Data Modelling and Computation • MA4272 Mathematical Tools for Data Science

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
DSA4211 High-Dimensional Statistical Analysis
AM4-ORFM

MA4254 Discrete Optimization
MA4260 Stochastic Operations Research
MA4264 Game Theory
MA4269 Mathematical Finance II
QF4103 Mathematical Models of Financial Derivatives
ST4245 Statistical Methods for Finance

</td></tr>
<tr><td>18.</td><td>24 May 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: Faculty of Science (FoS): Conversion of Second Majors from Restricted to Open and Revision to Prohibited Combinations

Circular no.: BUS Circular 22 AY20/21

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3.4.2 Second Major Programmes

Revised text (additions/changes in red):

Pre-requisites for Second Major Programmes:

<table>
<tr><th>SECOND MAJOR</th><th>PREREQUISITES</th></tr>
<tr><td>1. Chemistry</td><td>H2 pass in Chemistry or equivalent</td></tr>
<tr><td>2. Data Analytics</td><td>A very good H2 pass or equivalent in Mathematics/Further Mathematics.
~~Existing students from cohort 2016/2017 or later may apply to read a Second Major in Data Analytics after completing CS1010 (or its equivalent), MA1101R (or its equivalent) and MA1102R (or its~~</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td><s>equivalent) with a B+ grade or above in each of these modules.</s></td></tr>
<tr><td>3. Food Science</td><td>Good H2 pass in at least two science subjects; one of them should be Chemistry</td></tr>
<tr><td>4. Life Sciences</td><td>H2 passes or equivalent in Biology, Chemistry AND either Mathematics or Physics</td></tr>
<tr><td>5. Mathematics</td><td>H2 pass in Mathematics or equivalent</td></tr>
<tr><td>6. Physics</td><td>H2 pass in Physics or equivalent</td></tr>
<tr><td>7. Statistics</td><td>H2 pass in Mathematics or equivalent</td></tr>
</table>
</td></tr>
<tr><td>19.</td><td>21 Jun 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS: Department of Biological Sciences – Revised Requirements for the Minor in Aquatic Ecology Programme

Circular no.: BUS Circular 24 AY20/21

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3.4.3.2 Minor in Aquatic Ecology

Revised text (additions/changes in red):

To be awarded a Minor in Aquatic Ecology, a student must pass the six modules as set out below:

1. LSM2251 Ecology and Environment
2. LSM3254 Ecology of Aquatic Environments
3. GE2229 Water and Environment or GE3255 Aquatic, Riparian and Coastal Systems
4. SP3203 Aquatic Ecology Research
5. Choose 2 from the following elective modules: [For students reading Life Sciences Major, please select at least one non-LSM prefixed module.]

GE2103 Our Planet: An Earth Systems Science Perspective
GE2215 Introduction to GIS and Remote Sensing
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>GE2220 Terrestrial and Coastal Environments
GE2228/GE3253 Weather and Climate
GE3216 Applications of GIS & Remote Sensing
GE3221 Ecological Systems
GE3223/GE4234 Environmental Change in the Tropics
GE3231 Natural Hazards
GE3246/GE4237 Environmental Pollution
GE3256 Earth Surface Processes, Landforms and Ecosystems
LSM2253 Applied Data Analysis in Ecology and Evolution
LSM2252 Biodiversity
LSM4257 Aquatic Vertebrate Diversity
LSM4260 Plankton Ecology
LSM4261 Marine Biology
LSM4264 Freshwater Biology
LSM4266 Aquatic Invertebrate Diversity</td></tr>
<tr><td>20.</td><td>21 Jun 2021</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201718_FoS.pdf

Circular title:
Faculty of Science: Department of Biological Sciences – Proposal for a New Minor Programme in Bioinformatics (Senate Circular 11 AY19/20)

FoS: Department of Biological Sciences – Revised Requirements for the Minor in Bioinformatics Programme (BUS Circular 9 AY20/21)

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<u>Please insert a new row in the table</u>

<table><tr><th>MINOR</th><th>PREREQUISITES</th></tr><tr><td>15. Bioinformatics</td><td>Open to students from all disciplines</td></tr></table>
<u>Please insert a new title in 3.4.3 Minor Programmes</u></td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			To change the numbering as it is in alpha order, insert in 3.4.3.3 Minor in Bioinformatics **Current text:** 3.4.3.3 Minor in Biophysics 3.4.3.4 Minor in Engineering Materials 3.4.3.5 Minor in Financial Mathematics 3.4.3.6 Minor in Forensic Science 3.4.3.7 Minor in Geosciences 3.4.3.8 Minor in Life Sciences 3.4.3.9 Minor in Mathematics 3.4.3.10 Minor in Medical Physics 3.4.3.11 Minor in Nanoscience 3.4.3.12 Minor in Optical and Semiconductor Technology 3.4.3.13 Minor in Pharmaceutical Science 3.4.3.14 Minor in Physics 3.4.3.15 Minor in Statistics **Revised text:** 3.4.3.3 Minor in Bioinformatics 3.4.3.4 Minor in Biophysics 3.4.3.5 Minor in Engineering Materials 3.4.3.6 Minor in Financial Mathematics 3.4.3.7 Minor in Forensic Science 3.4.3.8 Minor in Geosciences 3.4.3.9 Minor in Life Sciences 3.4.3.10 Minor in Mathematics 3.4.3.11 Minor in Medical Physics 3.4.3.12 Minor in Nanoscience 3.4.3.13 Minor in Optical and Semiconductor Technology 3.4.3.14 Minor in Pharmaceutical Science 3.4.3.15 Minor in Physics 3.4.3.16 Minor in Statistics

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Please insert a new page for 3.4.3.3 Minor in Bioinformatics Host Department: Department of Biological Sciences Computational analysis of biological data is transforming biomedicine, environmental sciences, and biomedical engineering. The impact of bioinformatics and computational biology is pervasive: it is hard to overstate the impact of big data and computational demands upon the life sciences. In addition to their importance in the life sciences itself, bioinformatics and computational biology are also areas of increasing importance in the pharmaceutical sciences, applied computer science and computer engineering. The growth of these fields are fuelled by advancements in high-throughput, data-rich technologies, none more so than new technologies in DNA sequencing. To be awarded a Minor in Bioinformatics, a student must complete the following modules: **Core Modules (16 MCs)** CS1010 Programming Methodology (or its variant) LSM2241 Introductory Bioinformatics LSM3241 Genomic Data Analysis ZB4171 Advanced Topics in Bioinformatics **Elective Modules (8 MCs)** Pass two modules from the following: • CS2040 Data Structures and Algorithms • CS4220 Knowledge Discovery Methods in Bioinformatics • MA3259 Mathematical Methods in Genomics • ZB3288 Advanced UROPS in Computational Biology I • LSM4241 Functional Genomics This minor will be open to all majors except Computational Biology.
21.	15 Jul 2021	FoS	**Updates for Bulletin AY17/18** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf Circular no. and title:

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
BUS Circular 22 AY18/19 FASS: An Update on Computational Thinking Requirements in the FASS Undergraduate Curriculum

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3.3.1.7 Computational Thinking Requirement

Revised text (additions/changes in red):

<table>
<tr><th>MAJORS</th><th>OPTIONS TO FULFIL COMPUTATIONAL THINKING REQUIREMENT</th></tr>
<tr><td>Life Sciences,
Pharmaceutical Science,
Physics</td><td>Option 1: COS2000 – Computational Thinking for Scientists

or

Option 2: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology

or

Option 3: CS50 Introduction to Computer Science DYOM edX MOOCs</td></tr>
<tr><td>Chemistry,
Food Science & Technology</td><td>Option 1: COS2000 – Computational Thinking for Scientists

or

Option 2: CM3267 – Computational Thinking and Programming in Chemistry*

or

Option 3: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>or

Option 4: CS50 Introduction to Computer Science DYOM edX MOOCs</td></tr>
<tr><td>Pharmacy</td><td>It has been decided that the undergraduates for Cohort 2017/18 would be exempted from taking separate CT modules. Rather, the Pharmacy Department will work with the School of Computing to incorporate CT or elements of programming into the major requirements of Pharmacy.</td></tr>
<tr><td>Bachelor of Environmental Studies</td><td>All undergraduates (from FASS and FoS, in BES, inclusive of BES students in the UTCP or USP programme), will be required to do GET1031A/GET1050 Computational Reasoning. Students may choose to take the modules below as an alternative to fulfil the CT requirement:
• NM2207 Computational Media Literacy
• PH2113 Computation and Philosophy
• EC3305 Programming Tools for Economics
Higher-level computing modules (e.g. CS1010x, COS2000, CM3267) can also be taken in place of GET1050.

BES students doing the UTCP at Residential College 4 (RC4) and have read a Junior Seminar module (i.e., UTC1702%) are exempted from GET1031A/GET1050 as the RC4 programme encourages explicit use of representing thinking, using computer models.</td></tr>
</table>
</td></tr>
<tr><td>22.</td><td>15 Jul 2021</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular no. and title:
SFCC Circular 35 AY20/21 FoS: Proposal to Recognise FSC Prefix Modules in the Science Faculty Requirements

Page 249 of 358</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
3.3.1.6 Faculty Requirement

To replace the Table of Subject Groups with the following:
<table>
<tr><th>Subject Group</th><th>Majors in this Group</th><th>Module Codes in this Group</th></tr>
<tr><td>Computing Sciences</td><td>Quantitative Finance, Computational Science, Computational Biology</td><td>CZXXXX, CSXXXX*, COS2000, IT1001*, IT1002*, IT1006*, QFXXXX, ZBXXXX, CM3267</td></tr>
<tr><td>Chemical Sciences</td><td>Applied Chemistry, Chemistry, Food Science & Technology, Pharmaceutical Science, Pharmacy</td><td>CMXXXX, FSTXXXX, PHSXXXX, PRXXXX, FSC4208</td></tr>
<tr><td>Life Sciences</td><td>Food Science & Technology, Life Sciences, Pharmaceutical Science, Pharmacy</td><td>FSTXXXX, LSMXXXX, PHSXXXX, PRXXXX, FSC2101</td></tr>
<tr><td>Mathematical & Statistical Sciences</td><td>Applied Mathematics, Quantitative Finance, Computational Science, Mathematics, Statistics, Data Science and Analytics</td><td>CZXXXX, MAXXXX, STXXXX, QFXXXX, DSAXXXX</td></tr>
<tr><td>Physical Sciences</td><td>Physics</td><td>PCXXXX</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Multidisciplinary & Interdisciplinary Sciences</td><td>----</td><td>SP1201 or FMS12XX(B, C, M, P, S), FMS1201D (for Pre-Med students only), SP1202 (or one of the University Town pilot Writing Programme modules coded as WPxxxx, only applicable to cohorts who matriculated prior to AY2011/12)**, SP1203**, SP2251, SP3201, SP3202, SP3203, SP3277, SP1541^, SP2201, SP4261, SP4262, SP4263, SP4264, SP4265, SP4266, FSC3101, FSC4201, FSC4202, FSC4203, FSC4204, FSC4205, FSC4206, FSC4207</td></tr>
</table>

* Modules CSxxxx, IT1001, IT1002 and IT1006 are offered by the School of Computing but if read, may be counted towards Faculty requirements from the Computing Sciences Subject Group. Please note that edX MOOCs CS50's Introduction to Computer Science cannot be used to satisfy the faculty requirement.

** FoS students who have not read SP1202 may take one of these pilot UTWP modules to fulfil the Faculty Requirements. Students who have read SP1202 may still take one of these pilot UTWP modules and have it counted as a Unrestricted Electives (UE). Students who choose to read SP1202 and one of these pilot UTWP modules will only have SP1202 counted as Faculty Requirements and the pilot UTWP module as UE. Pharmacy students, who are required to read SP1203 for their Faculty Requirements, may only count SP1202 and the pilot UTWP module as UE. Students who intend to use the pilot UTWP module to fulfil the Faculty Requirements should not exercise S/U option on the module. Otherwise, the pilot UTWP module will be counted as UE.

^SP1541 is meant for student Cohort 2015 and after.</td></tr>
<tr><td>23.</td><td>16 Aug 2021</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS: Department of Biological Sciences – Removal of FSC52xx from the Requirements of the Minor Programme in Forensic Science</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			Circular no.: BUS Circular 1 AY21/22 Page 343 of 362 3.4.3.6 Minor in Forensic Science **Revised text (additions/changes in red):** **Essential Modules – Pass the following 3 modules (3 x 4MC = 12MC):** FSC2101/LSM1306 Forensic Science FSC3101/SP3202 Evidence in Forensic Science FSC4208/CM3301 Advanced Forensic Science **Elective Modules – Pass 12MCs of the following modules, including:** a) A maximum of 4MC from Level 1000 modules in the list b) A minimum of 4MC from Level 4000 modules in the list ~~c) Up to 4 MC can be replaced with FSC52xx modules~~ FSC4201/SP4261 Articulating Probability and Statistics in Court FSC4202/SP4262 Forensic Human Identification FSC4203/SP4263 Forensic Toxicology and Poisons FSC4204/SP4264 Criminalistics: Evidence and Proof [This is a 2MC module. Please complete an equivalent of 12 MC of elective modules for the purpose of Minor fulfilment.] FSC4205/SP4265 Criminalistics: Forgery Exposé with Forensic Science [This is a 2MC module. Please complete an equivalent of 12 MC of elective modules for the purpose of Minor fulfilment.] FSC4206/LL4362V Advanced Criminal Litigation – Forensics on Trial [5MC] FSC4207/SP4266 Forensic Entomology CM2101 Physical Chemistry 2 or CM3131 Applications of Physical Chemistry CM3242 Instrumental Analysis II LSM2105/LSM1102 Molecular Genetics LSM3211 Fundamental Pharmacology

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>PC1141 Introduction to Classical Mechanics or PC1431 Physics IE
PR1110/A Foundations in Medicinal Chemistry
PR3116 Concepts in Pharmacokinetics & Biopharmaceutics
ST2334 Probability and Statistics; OR MA2116/MA2216/ST2131 Probability
CM/FST/LSM/MA/PC/PR/ST/ZB3288 Advanced UROPS I (Forensic-Science related; subject to approval of Minor programme coordinator)</td></tr>
<tr><td>24.</td><td>9 Sep 2021</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS: Department of Physics – Proposed Revisions to the Second Major in Physics, Minors in Astronomy, Biophysics and Physics

Circular no.: BUS Circular 4 AY21/22

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3.4.2.5 Second Major in Physics

Revised text (additions/changes in red):

To be awarded a second major in Physics, candidates must satisfy the following:

<table>
<tr><th>MODULE LEVEL</th><th>SECOND MAJOR REQUIREMENTS</th><th>CUMULATIVE MAJOR MCS</th></tr>
<tr><td>Level-1000
(16 MCs)</td><td>Pass
PC1141 Introduction to Classical Mechanics
PC1142 Introduction to Thermodynamics and Optics
PC1143 Introduction to Electricity & Magnetism
PC1144 Introduction to Modern Physics</td><td>16</td></tr>
<tr><td>Level-2000
(16 MCs)</td><td>Pass:
• PC2130 Quantum Mechanics I</td><td>32</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>• PC2131/PC2031 Electricity and Magnetism I
• PC2193 Experimental Physics I

Any <u>one</u> from the following:
• PC2132 Classical Mechanics or PC2032 Classical Mechanics I
• PC2134 Mathematical Methods in Physics I
• PC2230 Thermodynamics and Statistical Mechanics</td><td></td></tr>
<tr><td>Level-3000
(16 MCs)</td><td>Pass
Any <u>four</u> from the following
• PC3130 Quantum Mechanics II
• PC3193 Experimental Physics II
• ALL PC32XX and PC42XX modules that can be used to fulfil the requirements for the Major Programme in Physics.</td><td>48</td></tr>
</table>

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3.4.3.14 Minor in Physics

Revised text (additions/changes in red):

To be awarded a minor in Physics, a student must pass the following six modules:

a. Any <u>one</u> from the following:
• PC1141 Introduction to Classical Mechanics
• PC1142 Introduction to Thermodynamics and Optics
• PC1143 Introduction to Electricity & Magnetism
• PC1431 Physics IE or PC1431X Physics IE
b. Any <u>one</u> from the following:
• PC1144 Introduction to Modern Physics
• PC1432/PC1432X Physics IIE
• PC2232 Physics for Electrical Engineers
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			c. Any four modules from the following of which at least two modules must be Level-3000 & above: • PC2130 Quantum Mechanics I • PC2131/PC2031 Electricity and Magnetism I • PC2132 Classical Mechanics or PC2032 Classical Mechanics I • PC2134 Mathematical Methods in Physics I • PC2230 Thermodynamics and Statistical Mechanics • PC2193 Experimental Physics I • PC3130 Quantum Mechanics II • PC3193 Experimental Physics II • ALL PC32XX and PC42XX modules **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201718_FoS.pdf Page 168 of 243 3.4.3.3 Minor in Biophysics **Revised text (additions/changes in red):** To be awarded a minor in Biophysics, the following are the requirements: For students undertaking a major in Life Sciences 1. Read and pass the following three essential modules: a. PC2267 Biophysics I b. PC3267 Biophysics II c. LSM3243 Molecular Biophysics 2. Read and pass three modules from the following (Maximum of two Level-1000 modules): a. PC1142 Introduction to Thermodynamics and Optics or PC1431/PC1431X Physics IE b. PC1143 Introduction to Electricity & Magnetism or PC1432 Physics IIE c. CM1402 General Chemistry d. PC2131/PC2031 Electricity & Magnetism e. PC2230 Thermodynamics & Statistical Mechanics f. LSM2102 Molecular Biology or LSM2232 Genes, Genomes and Biomedical Implications g. LSM2241 Introductory Bioinformatics

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			h. PC4267 Biophysics III i. PC4268 Biophysical Instrumentation and Biomolecular Electronics <u>For students undertaking a major in Physics</u> 1. Read and pass the following three essential modules: d. PC2267 Biophysics I e. PC3267 Biophysics II f. LSM3243 Molecular Biophysics 2. Read and pass three modules from the following (Maximum of two Level-1000 modules): a. LSM1101 Biochemistry of Biomolecules or LSM1106 Molecular Cell Biology b. LSM1102 Molecular Genetics c. CM1131 Physical Chemistry 1 d. PC2131/PC2031 Electricity & Magnetism e. PC2230 Thermodynamics & Statistical Mechanics f. LSM2102 Molecular Biology or LSM2232 Genes, Genomes and Biomedical Implications g. LSM2241 Introductory Bioinformatics h. PC4267 Biophysics III i. PC4268 Biophysical Instrumentation and Biomolecular Electronics <u>For students not undertaking a major in Life Sciences or Physics</u> 1. Read and pass the following three essential modules: a. PC2267 Biophysics I b. PC3267 Biophysics II c. LSM3243 Molecular Biophysics 2. Read and pass three modules from the following (Maximum of two Level-1000 modules): a. PC1142 Introduction to Thermodynamics and Optics or PC1431/PC1431X Physics IE b. PC1143 Introduction to Electricity & Magnetism or PC1432 Physics IIE c. LSM1101 Biochemistry of Biomolecules or LSM1106 Molecular Cell Biology d. LSM1102 Molecular Genetics e. CM1131 Physical Chemistry 1 f. PC2131/PC2031 Electricity & Magnetism g. PC2230 Thermodynamics & Statistical Mechanics h. LSM2102 Molecular Biology or LSM2232 Genes, Genomes and Biomedical Implications

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td>i. LSM2241 Introductory Bioinformatics
j. PC4267 Biophysics III
k. PC4268 Biophysical Instrumentation and Biomolecular Electronics</td></tr>
<tr><td>25.</td><td>2 Dec 2021</td><td>FoS</td><td><u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS_Physics – Proposed Changes to Existing Module (COS2000)

Circular No.: BUS Circular 10 AY21/22

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3.3.1.7 Computational Thinking Requirement

Revised text (additions/changes in red):

<table>
<tr><th>MAJORS</th><th>OPTIONS TO FULFIL COMPUTATIONAL THINKING REQUIREMENT</th></tr>
<tr><td>Life Sciences, Pharmaceutical Science, Physics</td><td>Option 1: COS1000/COS2000 – Computational Thinking for Scientists

or

Option 2: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology

or

Option 3: CS50 Introduction to Computer Science DYOM edX MOOCs</td></tr>
<tr><td>Chemistry, Food Science & Technology</td><td>Option 1: COS1000/COS2000 – Computational Thinking for Scientists

or</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th colspan="2">(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td></td><td></td><td></td><td colspan="2"><table>
<tr><td></td><td>Option 2: CM3267 – Computational Thinking and Programming in Chemistry*

or

Option 3: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology

or

Option 4: CS50 Introduction to Computer Science DYOM edX MOOCs</td></tr>
<tr><td>Pharmacy</td><td>It has been decided that the undergraduates for Cohort 2017/18 would be exempted from taking separate CT modules. Rather, the Pharmacy Department will work with the School of Computing to incorporate CT or elements of programming into the major requirements of Pharmacy.</td></tr>
<tr><td>Bachelor of Environmental Studies</td><td>All undergraduates (from FASS and FoS, in BES, inclusive of BES students in the UTCP or USP programme), will be required to do GET1031A/GET1050 Computational Reasoning. Students may choose to take the modules below as an alternative to fulfil the CT requirement:
• NM2207 Computational Media Literacy
• PH2113 Computation and Philosophy
• EC3305 Programming Tools for Economics
Higher-level computing modules (e.g. CS1010x, COS2000, CM3267) can also be taken in place of GET1050.

BES students doing the UTCP at Residential College 4 (RC4) and have read a Junior Seminar module (i.e., UTC1702%) are exempted from GET1031A/GET1050 as the RC4 programme encourages explicit use of representing thinking, using computer models.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/ School/</th><th>(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)</th></tr>
<tr><td>26.</td><td>13 Jan 2022</td><td>FoS</td><td>
<u>Updates for Bulletin AY17/18</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/Bulletin-Updates-AY1718.pdf

Circular title: FoS_Biological Sciences – Proposal for New Module (LSM2302)

Circular No.: BUS Circular 24 AY20/21

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3.3.1.7 Computational Thinking Requirement

Revised text (additions/changes in red):

<table>
<tr><th>MAJORS</th><th>OPTIONS TO FULFIL COMPUTATIONAL THINKING REQUIREMENT</th></tr>
<tr><td>Life Sciences, Pharmaceutical Science, Physics</td><td>Option 1: COS1000/COS2000 – Computational Thinking for Scientists

or

Option 2: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology

or

Option 3: LSM2302 – Computational Thinking for Life Sciences

or

Option <s>3</s> 4: CS50 Introduction to Computer Science DYOM edX MOOCs</td></tr>
<tr><td>Chemistry,</td><td>Option 1: COS1000/COS2000 – Computational Thinking for Scientists

or</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)	
			Food Science & Technology	Option 2: CM3267 – Computational Thinking and Programming in Chemistry* or Option 3: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology or Option 4: LSM2302 – Computational Thinking for Life Sciences or Option 4 5: CS50 Introduction to Computer Science DYOM edX MOOCs
			Pharmacy	It has been decided that the undergraduates for Cohort 2017/18 would be exempted from taking separate CT modules. Rather, the Pharmacy Department will work with the School of Computing to incorporate CT or elements of programming into the major requirements of Pharmacy.
			Bachelor of Environmental Studies	All undergraduates (from FASS and FoS, in BES, inclusive of BES students in the UTCP or USP programme), will be required to do GET1031A/GET1050 Computational Reasoning. Students may choose to take the modules below as an alternative to fulfil the CT requirement: • NM2207 Computational Media Literacy • PH2113 Computation and Philosophy • EC3305 Programming Tools for Economics Higher-level computing modules (e.g. CS1010x, COS1000/COS2000, CM3267, LSM2302) can also be taken in place of GET1050. BES students doing the UTCP at Residential College 4 (RC4) and have read a Junior Seminar module (i.e., UTC1702%) are exempted from

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			<table><tr><td></td><td>GET1031A/GET1050 as the RC4 programme encourages explicit use of representing thinking, using computer models.</td></tr></table>
27.	13 Jan 2022	FoS	**<u>Updates for Bulletin AY17/18</u>** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201718_FoS.pdf Circular title: FoS: Department of Biological Sciences – Delisting ZB4171 as an LSM-Recognised Elective Module and Changes to Requirements of the Minor in Bioinformatics Circular No.: BUS Circular 11 AY21/22 Page 356 of 370 **<u>3.4.3.3 Minor in Bioinformatics</u>** To be awarded a Minor in Bioinformatics, a student must complete the following modules: **<u>Core Modules (16 MCs)</u>** CS1010/CS1101S Programming Methodology (or its variant) LSM2241 Introductory Bioinformatics LSM3241 Genomic Data Analysis ZB4171 Advanced Topics in Bioinformatics **<u>Elective Modules (8 MCs)</u>** Pass two modules from the following: • CS2040 Data Structures and Algorithms (or its variant) • CS4220 Knowledge Discovery Methods in Bioinformatics • MA3259 Mathematical Methods in Genomics • ZB3288 Advanced UROPS in Computational Biology I • LSM4241 Functional Genomics This minor will be open to all majors except Computational Biology.

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
28.	13 Jan 2022	FoS	**Updates for Bulletin AY17/18** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1819.pdf Circular title: FoS_Pharmacy – Proposal to Revise the Minor in Pharmaceutical Science for Cohorts AY2020/21 and Before Circular no.: BUS Circular 11 AY21/22 Page 338 of 370 3.4.3.12 Minor in Pharmaceutical Science **Revised text (additions/changes in red):** Essential modules: • PR1110 Foundations for Medicinal Chemistry or PHS1110 Foundation for Medicinal and Synthetic Chemistry or PHS1101 Billion Dollar Pill – Bench to Bedside Drug Development • PR2114 Formulation and Technology I or PHS1114 Principles of Pharmaceutical Formulations I or PHS2105 Principles of Pharmaceutical Formulations I • PR2115 Medicinal Chemistry for Drug Design or PHS2115 Basic Principles of Drug Design and Development or PHS2102 Physicochemical Principles of Drug Action • PR3301 Pharmaceutical Dosage Forms or PR3117 Formulations & Technology II or PHS2117 Principles of Pharmaceutical Formulations II or PR5304 Fundamental Topics in Pharmaceutical Science Any two of the following modules: • PR1301 Complementary Medicine and Health • PR2143 Pharmaceutical Analysis for Quality Assurance or PHS2143 Analytical Techniques and Pharmaceutical Applications or PHS2103 ~~Rational Drug Design and Molecular Characterization {placeholder title}~~ Essentials of Pharmaceutical and Synthetic Chemistry • PR2202 Cosmetics and Perfumes • PR3204 Medicinal Natural Products • PR4205 Bioorganic Principles of Medicinal Chemistry • PR4206 Industrial Pharmacy • CN4241R Engineering Principles for Drug Delivery

S/N	Date	Faculty/ School/	(B) Updates for NUS Bulletin 2017-18 after archival (i.e., from 1 July 2018 onwards)
			• SP4263/FSC4203 Forensic Toxicology and Poisons

(13 Jan 2022)