Archived NUS Bulletin 2019-20
Section 22: Bulletin Updates

(A) Updates included in NUS Bulletin 2019-20 before archival (i.e., up to 30 June 2020)

- FASS
- BIZ
- SoC
- SCALE
- SDE
- FoE
- LAW
- NUSMed
- NGS
- YSTCM
- SSHSPH
- FoS
- Yale-NUS
- CFG
- CTPCLC
- UTCP
- OSA
- RO

(B) Updates for NUS Bulletin 2019-120 after archival (i.e., from 1 July 2020 onwards)

- FoS
- SoC

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
1.	21 Jun 2019	FASS	**Special Programmes website – Updates submitted by FASS (21 Jun 2019)** http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/minor-programmes.html Film Production minor to be removed from the list. Tisch is no longer offering the SEP places to make this Minor viable any longer. We are in the midst of getting it formally removed. European Studies's Host Faculty/Department should be changed from Office of Programmes to History. The Chinese Translation Minor should be listed under Multidisciplinary Minors http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html The Social Work link should be updated to : https://www.fas.nus.edu.sg/swk/courses/undergraduates/entry_graduation_requirement The Chinese Languages link should be updated to: http://www.fas.nus.edu.sg/chs/eng/admission/prospective_undergrad.html The Chinese Studies link should be updated to: http://www.fas.nus.edu.sg/chs/eng/admission/prospective_undergrad.html The Political Science link should be updated to: http://www.fas.nus.edu.sg/pol/undergraduate/graduation-requirements-cohort-2016onwards.html The Geography link should be updated to: https://www.fas.nus.edu.sg/geog/undergraduate/graduation-requirements.html The Japanese Studies link should be updated to: https://www.fas.nus.edu.sg/jps/undergraduate/graduation_requirements.html http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-concurrent-joint-degree-programmes-with-overseas-universities.html

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>To add the highlighted words.

JDPs with Australian National University

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) (Not offered with effect from AY2019/2020 onwards)

Joint Bachelor of Science (Honours) NUS and Bachelor of Philosophy (Honours) ANU
(for students in the University Scholars Programme)

http://www.nus.edu.sg/registrar/education-at-nus/graduate-education/special-graduate-programmes/double-degree-and-joint-degree-programmes-with-overseas-universities.html

The link for the MA in Chinese Language with PKU is broken. Please replace the broken link with http://www.fas.nus.edu.sg/chs/eng/admission/double_degree_master_arts.html.

For our JDP with KCL, please change the name to “King’s College London”. The name in the hyperlink is currently reflected as “King’s College of London”.</td></tr>
<tr><td>2.</td><td>10 Sep 2019</td><td>FASS</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

Please link the programme shaded in yellow to the correct link indicated below. Thanks.

<table>
<tr><td>DDP with Sciences Po

• Bachelor with Honours Degree from NUS and Bachelor of Arts from Sciences Po
(for students in the University Scholars Programme)</td><td>Correct link:
http://www.usp.nus.edu.sg/nus-sciencespo/</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 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>3.</td><td>13 Aug 2019</td><td>BIZ</td><td>
<table>
<tr><th>TITLE & NAME</th><th>DESIGNATION/RESPONSIBILITY</th><th>TELEPHONE (6516-XXXX)</th><th>EMAIL (XXXX@NUS.EDU.SG)</th></tr>
<tr><td><s>Prof Bernard YEUNG</s>
Prof Andrew ROSE</td><td>Dean</td><td>6516 3075</td><td>bizdean</td></tr>
<tr><td><s>Prof Kulwant SINGH</s>
Prof HUM Sin Hoon</td><td>Deputy Dean</td><td>6601 1255</td><td>bizdd1</td></tr>
<tr><td>Assoc Prof CHNG Chee Kiong</td><td>Vice-Dean (Undergraduate Studies)</td><td>6516 7272</td><td>bizvd2</td></tr>
<tr><td>Prof Jochen WIRTZ</td><td>Vice-Dean (Graduate Studies)</td><td>6516 3871</td><td>bizgrad</td></tr>
<tr><td><s>Assoc Prof CHONG Juin Kuan</s>
Prof Andrew ROSE</td><td>Vice-Dean (PhD & Research)</td><td>6516 3039</td><td>bizvd5</td></tr>
<tr><td>Dr Jumana ZAHALKA</td><td>Assistant Dean (Undergraduate Academic) / Academic Director (MSc in Management & CEMS MIM)</td><td>6516 5303</td><td>bizad1</td></tr>
<tr><td>Assoc Prof Ravi CHANDRAN</td><td>Assistant Dean (Undergraduate Academic)</td><td>6516 3045</td><td>bizad4</td></tr>
<tr><td>Dr Helen CHAI</td><td>Assistant Dean (Undergraduate Admissions & Student Life)</td><td>6516 5864</td><td>bizad3</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)			
			Assoc Prof Nitin PANGARKAR	Academic Director (The NUS MBA / The NUS MBA with HEC Paris)	6516 5299	bizpn
			Prof Sheila WANG	Academic Director (The NUS MBA Management Practicum)	6516 5967	bizwangs
			Assoc Prof Brian HWARNG	Academic Director (The NUS MBA with Peking University / S3 Asia MBA)	6516 6449	bizhhl
			Assoc Prof Prem N. SHAMDASANI	Academic Director (The NUS Executive MBA)	6516 6264	bizps
			Assoc Prof LAN Luh Luh	Academic Director (UCLA-NUS Executive MBA)	6516 3099	bizlanll
			Assoc Prof WU Yaozhong	Academic Director (The NUS Executive MBA (Chinese))	6516 3022	bizwyz
			Assoc Prof Johan SULAEMAN	Academic Director (MSc in Finance)	6516 1403	bizjoha
			Assoc Prof CHU Junhong	Academic Director (MSc in Marketing Analytics and Insights)	6516 6938	Bizcj
			~~Assoc Prof Charles SHI~~ Prof KE Bin	~~Co-Academic~~ Associate Director (Master in Public Administration & Management)	~~6516 1678~~ 6601 3133	~~Bizshiy~~ bizk
			Prof Edmund KEUNG	Head, Accounting	6516 3024	acchead
			Prof Melvyn SIM	Head, Analytics and Operations	6516 5223	dschead

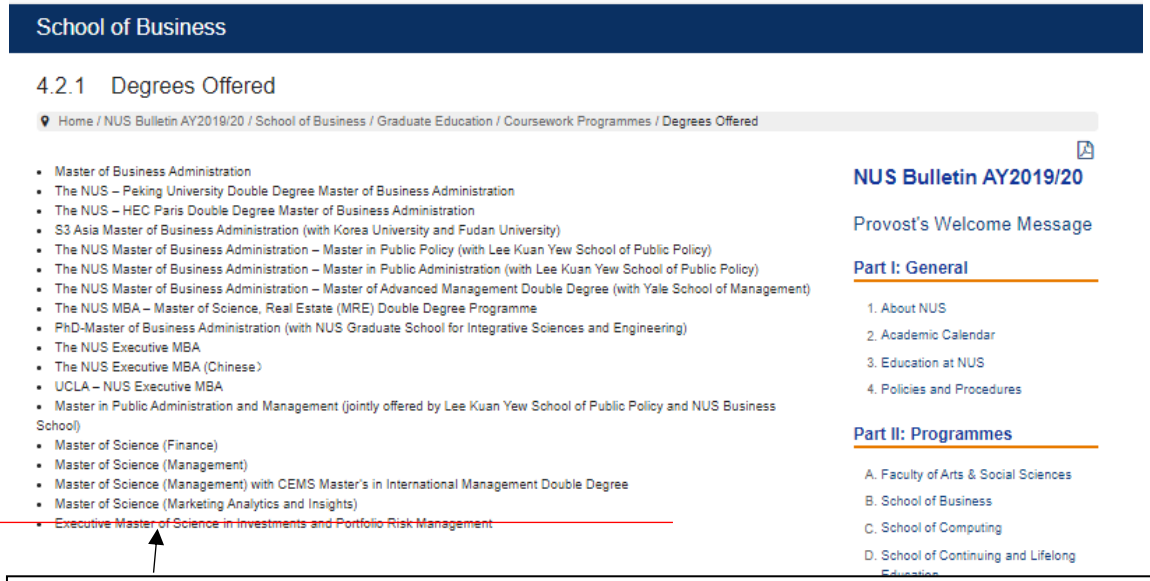
S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)			
			Prof Sumit AGARWAL	Head, Finance	6516 8119	fnbhead
			Assoc Prof LEE Yih Hwai	Head, Marketing	6516 3058	mkthead
			Prof Michael FRESE	Head, Management and Organisation	6516 1500	obrhead
			Prof Andrew DELIOS	Head, Strategy and Policy	6516 3094	bsphead
			Assoc Prof Stephen LYNN	Academic Advisor, Accounting	6516 1418	bizcck
			Assoc Prof CHU Chun Lin Singfat	Academic Advisor, Analytics and Operations	6516 3031	bizchucl
			Assoc Prof Ruth TAN	Academic Advisor, Finance	6516 6265	biztansk
			Assoc Prof Audrey CHIA	Academic Advisor, Management and Organisation	6516 6441	bizchiaa
			Assoc Prof ANG Swee Hoon	Academic Advisor, Marketing	6516 3173	bizangsh
			Assoc Prof TER Kah Leng nee Khew	Academic Advisor, Strategy and Policy	6516 3084	bizterkl
			Ms LAM Yin Wah	Administrative Coordinator, Accounting	6516 7798	accsec

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Ms LEE Chwee Ming</td><td>Administrative Coordinator, Analytics and Operations</td><td>6516 6225</td><td>bizlcm</td></tr>
<tr><td>Ms Callie TOH</td><td>Administrative Coordinator, Finance</td><td>6516 3066</td><td>fnbsec</td></tr>
<tr><td><s>Ms Wendy LIM</s>
Ms LAI Kwai Yoong</td><td>Administrative Coordinator, Management and Organisation</td><td><s>6516 5143</s>
6516 3187</td><td><s>Obrlimw</s>
bizlaik</td></tr>
<tr><td>Ms Jothi S.</td><td>Administrative Coordinator, Marketing</td><td>6516 3058</td><td>mktsec</td></tr>
<tr><td>Ms Azlina bte KASMARI</td><td>Administrative Coordinator, Strategy and Policy</td><td>6516 1321</td><td><s>Bspak</s>
bizazk</td></tr>
</table>
</td></tr>
<tr><td>4.</td><td>2 Oct 2019</td><td>BIZ</td><td><u>Discontinuation of the NUS Executive Master of Science in Investments and Portfolio Risk Management (EMIR) Programme</u>

To remove information about EMIR programme from a few webpages below:
1. Removal of the last programme listed under 4.2.1 Degrees Offered

URL: http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degrees-offered/

Change: Please remove the programme highlighted in red and refer to the screen shot below:
• Master of Business Administration
• The NUS – Peking University Double Degree Master of Business Administration
• The NUS – HEC Paris Double Degree Master of Business Administration
• S3 Asia Master of Business Administration (with Korea University and Fudan University)
• The NUS Master of Business Administration – Master in Public Policy (with Lee Kuan Yew School of Public Policy)</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy) • The NUS Master of Business Administration – Master of Advanced Management Double Degree (with Yale School of Management) • The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme • PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering) • The NUS Executive MBA • The NUS Executive MBA (Chinese） • UCLA – NUS Executive MBA • Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and NUS Business School) • Master of Science (Finance) • Master of Science (Management) • Master of Science (Management) with CEMS Master's in International Management Double Degree • Master of Science (Marketing Analytics and Insights) • Executive Master of Science in Investments and Portfolio Risk Management  School of Business 4.2.1 Degrees Offered Home / NUS Bulletin AY2019/20 / School of Business / Graduate Education / Coursework Programmes / Degrees Offered • Master of Business Administration • The NUS – Peking University Double Degree Master of Business Administration • The NUS – HEC Paris Double Degree Master of Business Administration • S3 Asia Master of Business Administration (with Korea University and Fudan University) • The NUS Master of Business Administration – Master in Public Policy (with Lee Kuan Yew School of Public Policy) • The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy) • The NUS Master of Business Administration – Master of Advanced Management Double Degree (with Yale School of Management) • The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme • PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering) • The NUS Executive MBA • The NUS Executive MBA (Chinese） • UCLA – NUS Executive MBA • Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and NUS Business School) • Master of Science (Finance) • Master of Science (Management) • Master of Science (Management) with CEMS Master's in International Management Double Degree • Master of Science (Marketing Analytics and Insights) • Executive Master of Science in Investments and Portfolio Risk Management NUS Bulletin AY2019/20 Provost's Welcome Message Part I: General 1. About NUS 2. Academic Calendar 3. Education at NUS 4. Policies and Procedures Part II: Programmes A. Faculty of Arts & Social Sciences B. School of Business C. School of Computing D. School of Continuing and Lifelong Education Under 4.2.1. Degrees Offered - to remove the last programme "Executive Master of Science in Investments and Portfolio Risk Management".

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			2. Removal of EMIR Programme from Graduate Education – Coursework Programme URL: http://www.nus.edu.sg/nusbulletin/school-of-business/ Change: Please remove 4.2.2.18 from the list below or refer to the screen shot on the next page: 4.2.2 Degree Requirements 4.2.2.1 Master of Business Administration 4.2.2.2 The NUS – Peking University Double Degree Master of Business Administration 4.2.2.3 The NUS – HEC Paris Double Degree Master of Business Administration 4.2.2.4 S3 Asia MBA 4.2.2.5 The NUS Master of Business Administration – Master in Public Policy (with Lee Kuan Yew School of Public Policy) 4.2.2.6 The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy) 4.2.2.7 The NUS Master of Business Administration – Master of Advanced Management Double Degree (with Yale School of Management) 4.2.2.8 The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme 4.2.2.9 PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering) 4.2.2.10 The NUS Executive MBA 4.2.2.11 The NUS Executive MBA – Chinese 4.2.2.12 UCLA – NUS Executive MBA 4.2.2.13 Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and the NUS Business School)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			4.2.2.14 Master of Science (Finance) 4.2.2.15 Master of Science (Management) 4.2.2.16 Master of Science (Management) with CEMS Master's in International Management Double Degree 4.2.2.17 Master of Science (Marketing Analytics and Insights) 4.2.2.18 Executive Master of Science in Investments and Portfolio Risk Management

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			

School of Business

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4 Graduate Education
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    - 4.2.2.1 Master of Business Administration
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    - 4.2.2.5 The NUS Master of Business Administration – Master in Public Policy (with Lee Kuan Yew School of Public Policy)
    - 4.2.2.6 The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy)
    - 4.2.2.7 The NUS Master of Business Administration – Master of Advanced Management Double Degree (with Yale School of Management)
    - 4.2.2.8 The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme
    - 4.2.2.9 PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering)
    - 4.2.2.10 The NUS Executive MBA
    - 4.2.2.11 The NUS Executive MBA – Chinese
    - 4.2.2.12 UCLA – NUS Executive MBA
    - 4.2.2.13 Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and the NUS Business School)
    - 4.2.2.14 Master of Science (Finance)
    - 4.2.2.15 Master of Science (Management)
    - 4.2.2.16 Master of Science (Management) with CEMS Master's in International Management Double Degree
    - 4.2.2.17 Master of Science (Marketing Analytics and Insights)
    - 4.2.2.18 Executive Master of Science in Investments and Portfolio Risk Management

NUS Bulletin AY2019/20

Provost's Welcome Message

Part I: General
1. About NUS
2. Academic Calendar
3. Education at NUS
4. Policies and Procedures

Part II: Programmes
A. Faculty of Arts & Social Sciences
B. School of Business
C. School of Computing
D. School of Continuing and Lifelong Education
E. Faculty of Dentistry
F. School of Design & Environment
G. Faculty of Engineering
H. NUS Graduate School for Integrative Sciences and Engineering
I. Faculty of Law
J. Yong Loo Lin School of Medicine
K. Saw Swee Hock School of Public Health
L. Faculty of Science
M. University Scholars Programme
N. Duke-NUS Medical School
O. Lee Kuan Yew School of Public Policy
P. Yale-NUS College
Q. Yong Siew Toh Conservatory of Music
R. Teaching Institutions
1. Centre for English Language and Communication
2. Institute of Systems Science
S. Other Multidisciplinary/ Special Programmes
T. Bulletin Updates

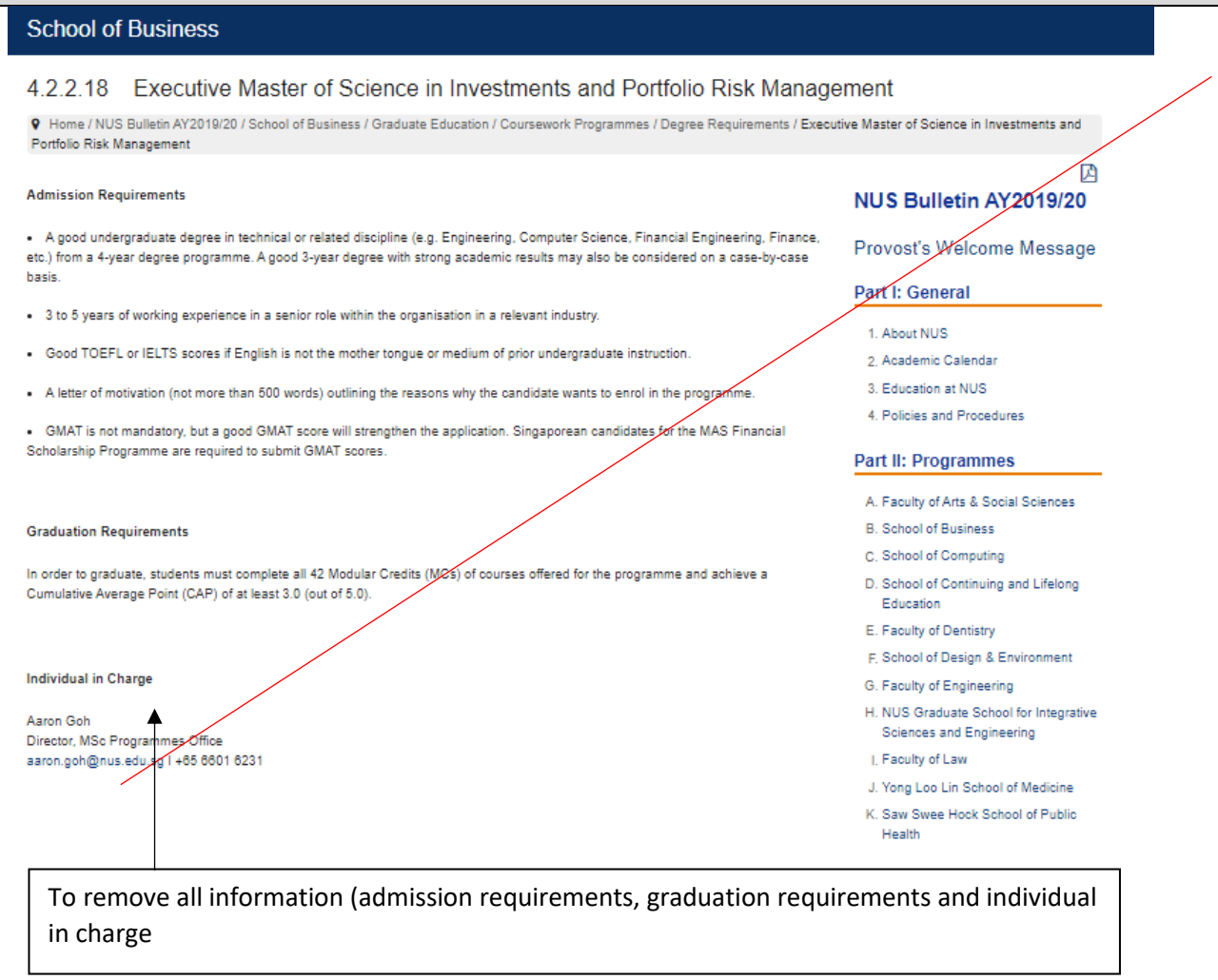
Part III: Modules
Search Modules

Part IV: Archived Bulletins
AY2018/19
AY2017/18
AY2016/17

Under 4.2.2. Degree Requirements - to remove 4.2.2.18 Executive Master of Science in Investments and Portfolio Risk Management

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Under 4.2.1 Degrees Offered - to remove the last programme: Executive Master of Science in Investments and Portfolio Risk Management 3. Removal of EMIR Programme Information under point 4.2.2.18 URL: http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/executive-master-of-science-in-investments-and-portfolio-risk-management/ Change: Kindly remove all information on Admission Requirements, Graduation Requirements and Individual in Charge as highlighted below. Screen shot can be found on the next page. **Admission Requirements** • A good undergraduate degree in technical or related discipline (e.g. Engineering, Computer Science, Financial Engineering, Finance, etc.) from a 4-year degree programme. A good 3-year degree with strong academic results may also be considered on a case-by-case basis. • 3 to 5 years of working experience in a senior role within the organisation in a relevant industry. • Good TOEFL or IELTS scores if English is not the mother tongue or medium of prior undergraduate instruction. • A letter of motivation (not more than 500 words) outlining the reasons why the candidate wants to enrol in the programme. • GMAT is not mandatory, but a good GMAT score will strengthen the application. Singaporean candidates for the MAS Financial Scholarship Programme are required to submit GMAT scores. **Graduation Requirements** In order to graduate, students must complete all 42 Modular Credits (MCs) of courses offered for the programme and achieve a Cumulative Average Point (CAP) of at least 3.0 (out of 5.0).

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Individual in Charge Aaron Goh Director, MSc Programmes Office aaron.goh@nus.edu.sg I +65 6601 6231

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			

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<tr><td></td><td></td><td></td><td>
4. EMIR Programme & Contact Details

URL: http://www.nus.edu.sg/admissions/graduate-studies/graduate-programme-and-contacts.html

Change: to remove EMIR Programme & its contact from Graduate Programme & Contacts (under School of Business) as highlighted below:
<table>
<tr><th>Graduate Studies by Coursework</th><th>Contacts</th></tr>
<tr><td>• Master of Business Administration
• MBA with Specialisation in Real Estate
• Double Degree with Lee Kuan Yew School of Public Policy
• NUS-HEC Paris Double Degree MBA
• NUS-Peking University Double Degree MBA
• S3 Asia MBA</td><td>Tel: [65] 65162068
Tel: [65] 68724423
Email: mba@nus.edu.sg</td></tr>
<tr><td>• The NUS Executive MBA</td><td>Tel: [65] 65167800
Fax: [65] 67759097
Email: apexe@nus.edu.sg</td></tr>
<tr><td>• The NUS Executive MBA (Chinese)</td><td>Tel: [65] 65168656
Fax: [65] 67759097
Email: apexc@nus.edu.sg</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

• UCLA-NUS Executive MBA	Tel: [65] 65161351 Fax: [65] 67759097 Email: ucla@nus.edu.sg
• Master in Public Administration and Management in collaboration with LKYSPP (in Chinese)	Tel: [65] 65168352 Email: bizmpam@nus.edu.sg
• Master of Science in Finance	Tel: [65] 65163370 Email: mscfin@nus.edu.sg
• Master of Science in Management	Tel: [65] 65168660 Email: mscmgt@nus.edu.sg
• Master of Science in Marketing Analytics and Insights	Tel: [65] 65163370 Email: mscmarketing@nus.edu.sg
• Master of Science in Business Analytics	Tel: [65] 65161510 Email: msba@nus.edu.sg
• Executive Master of Science in Investments and Portfolio Risk Management (EMIR)	Tel: [65] 65165180 Email: biz.emir@nus.edu.sg

Below is the screen shot:

Graduate Programme & Contacts

Home / Contact Us

Quick Links

Enquires should be directed to the following Graduate Divisions of the respective Faculties/Schools conducting the programmes.

→ Faculty of Arts & Social Sciences

↓ School of Business

NUS Business School, NUS, 1 Business Link, Singapore 117592

Webpage : http://www.bschool.nus.edu.sg

Graduate Studies by Coursework	Contacts
• Master of Business Administration • MBA with Specialisation in Real Estate • Double Degree with Lee Kuan Yew School of Public Policy • NUS-HEC Paris Double Degree MBA • NUS-Peking University Double Degree MBA • S3 Asia MBA	Tel: [65] 65162068 Tel: [65] 68724423 Email: mba@nus.edu.sg
• The NUS Executive MBA	Tel: [65] 65167800 Fax: [65] 67759097 Email: apexe@nus.edu.sg
• The NUS Executive MBA (Chinese)	Tel: [65] 65168656 Fax: [65] 67759097 Email: apexc@nus.edu.sg
• UCLA-NUS Executive MBA	Tel: [65] 65161351 Fax: [65] 67759097 Email: ucla@nus.edu.sg
• Master in Public Administration and Management in collaboration with LKYSPP (in Chinese)	Tel: [65] 65168352 Email: bizmpam@nus.edu.sg
• Master of Science in Finance	Tel: [65] 65163370 Email: mscfin@nus.edu.sg
• Master of Science in Management	Tel: [65] 65168660 Email: mscmgt@nus.edu.sg
• Master of Science in Marketing Analytics and Insights	Tel: [65] 65163370 Email: mscmarketing@nus.edu.sg
• Master of Science in Business Analytics	Tel: [65] 65161510 Email: msba@nus.edu.sg
• Executive Master of Science in Investments and Portfolio Risk Management (EMIR)	Tel: [65] 65165180 Email: biz.emir@nus.edu.sg

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Please remove Executive Master of Science in Investments and Portfolio Risk Management (EMIR) and its contact details.
5.	15 Jan 2020	BIZ	**1. Request to remove the following page from NUS Bulletin AY2019/20.** The URL is http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/master-in-public-administration-and-management-in-chinese-with-lee-kuan-yew-school-of-public-policy/ The full page (copied below in red in box) shall be removed as BIZ won't offer this coursework programme from AY2019/20 onwards.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			1. **Request to remove the following page from NUS Bulletin AY2019/20.** The URL is http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/master-in-public-administration-and-management-in-chinese-with-lee-kuan-yew-school-of-public-policy/ The full page (copied below in red in box) shall be removed as BIZ won't offer this coursework programme from AY2019/20 onwards. **4.2.2.13 Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and 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, Programme Management (EMBA-C & MPAM) brendacao@nullnus.edu.sg | +65 6516 5271 **Remove the full page and all these contents please.**

2. Request to update the following page in NUS Bulletin AY2019/20.

The URL is http://www.nus.edu.sg/nusbulletin/school-of-business/

The line highlighted in red in box below shall be removed.

School of Business

1 Faculty's Commitment

2 Key Contact Information

3 Undergraduate Education

3.1 Degrees Offered

3.2 Degree Requirements

3.2.1 Admission Requirements

3.2.2 Advanced placement and exemptions

3.2.3 Curriculum Structure and Requirements

3.2.3.1 Bachelor of Business Administration (B.B.A.) / Bachelor of Business Administration with Honours [B.B.A. (Hons.)]

3.2.3.2 Bachelor of Business Administration (Accountancy) / Bachelor of Business Administration (Accountancy) with Honours

3.2.4 Assessment Modes

3.3 Multidisciplinary Opportunities

3.3.1 Double (Second) Major in Management Programme

4.2.2 Degree Requirements

4.2.2.1 Master of Business Administration

4.2.2.2 The NUS – Peking University Double Degree Master of Business Administration

4.2.2.3 The NUS – HEC Paris Double Degree Master of Business Administration

4.2.2.4 S3 Asia MBA

4.2.2.5 The NUS Master of Business Administration – Master in Public Policy (with Lee Kuan Yew School of Public Policy)

4.2.2.6 The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy)

4.2.2.7 The NUS Master of Business Administration – Master of Advanced Management Double Degree (with Yale School of Management)

4.2.2.8 The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme

4.2.2.9 PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering)

4.2.2.10 The NUS Executive MBA

4.2.2.11 The NUS Executive MBA – Chinese

4.2.2.12 UCLA – NUS Executive MBA

Remove the line and its link. Update the numbering if needed please.

4.2.2.13 Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and the NUS Business School)

(Please assist to re-number the following sections here and also go into the individual sections to change the re-numbering accordingly)

4.2.2.14 4.2.2.13 Master of Science (Finance)

4.2.2.15 4.2.2.14 Master of Science (Management)

4.2.2.16 4.2.2.15 Master of Science (Management) with CEMS Master's in International Management Double Degree

4.2.2.17 4.2.2.16 Master of Science (Marketing Analytics and Insights)

4.2.3 Financial Assistance and Awards

3. Request to update the following page in NUS Bulletin AY2019/20

The URL is http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degrees-offered/

The line highlighted in red in box below shall be removed.

4.2.1 Degrees Offered

- Master of Business Administration
- The NUS – Peking University Double Degree Master of Business Administration
- The NUS – HEC Paris Double Degree Master of Business Administration
- S3 Asia Master of Business Administration (with Korea University and Fudan University)
- The NUS Master of Business Administration – Master in Public Policy (with Lee Kuan Yew School of Public Policy)
- The NUS Master of Business Administration – Master in Public Administration (with Lee Kuan Yew School of Public Policy)
- The NUS Master of Business Administration – Master of Advanced Management Double Degree (with Yale School of Management)
- The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme
- PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering)
- The NUS Executive MBA
- The NUS Executive MBA (Chinese)
- UCLA – NUS Executive MBA
- Master in Public Administration and Management (jointly offered by Lee Kuan Yew School of Public Policy and NUS Business School)
- Master of Science (Finance) Master of Science (Management)
- Master of Science (Management) with CEMS Master's in International Management Double
- Degree Master of Science (Marketing Analytics and Insights)

Remove the line please.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			4. Request to update the following page in NUS Bulletin AY2019/20 The URL is http://www.nus.edu.sg/nusbulletin/school-of-business/key-contact-information/ 
6.	4 Mar 2020	BIZ MBA	http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/master-of-business-administration/ 4.2.2.1 Master of Business Administration

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

MODULE CODE	MODULE NAME	MC	REQUIREMENT	REMARK	
Core	BMA5001	Managerial Economics	4	Required	
	BMA5003	Financial Accounting	4	Required	
	BMA5008	Financial Management	4	Required	Recommend to take prior to finance electives
	BMA5009	Marketing Management	4	Required	Recommend to take prior to marketing electives
	BMA5013	Corporate Strategy	4	Required	Strongly recommended to take only after completing BMA5003 and BMA5009
	BMA5016	Leading with Impact	4	Required	
	BMA5017	Managerial Operations & Analytics	4	Required	
	BMA5801	~~Management Communication~~	4	Required	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

		Launch Your Transformation			
	BMA5802	~~Management Skills~~ MBA Survival Kit	4	Required	
	BMA5901	~~Management Practicum~~ MBA Consulting Project	4	Required	
	Total Core Requirements			**40 MCs**	
	Total Elective Requirements			**28 MCs**	
	Total MBA Requirements			**68 MCs**	

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/the-nus-peking-university-double-degree-master-of-business-administration/

4.2.2.2 The NUS – Peking University Double Degree Master of Business Administration

MODULE CODE	MODULE NAME	MC	REMARK
BMA5016	Leading with ~~Impaact~~ Impact	4	Students who read Leadership in Organization elective at PKU may apply to waive this requirement

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

BMA5801	~~Management Communication~~ Launch Your Transformation	4	Students who read Management Communication elective at PKU may apply to waive this requirement
BMA5802	~~Management Skills~~ MBA Survival Kit	4	
BMA5901	~~Management Practicum~~ MBA Consulting Project	4	Students who has done an Integrated Practicum Project module in PKU may apply to waive this requirement
Total Core		**16**	
Total Elective		**28**	**Total elective MCs would depend on the core modules that are waived.**
Total Requirements for NUS		**44**	

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/the-nus-hec-paris-double-degree-master-of-business-administration/

4.2.2.3 The NUS – HEC Paris Double Degree Master of Business Administration

Starting at HEC Paris:

Students starting at HEC Paris are required to meet the following credit requirements at NUS:

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>MODULE CODE</th><th>MODULE NAME</th><th>MC</th><th>REMARK</th></tr>
<tr><td>BMA5801</td><td><s>Management Communication</s>
Launch Your Transformation</td><td>4</td><td>Students who read Communication Management Center workshop (Act Your Success) may apply to waive this module</td></tr>
<tr><td>BMA5802</td><td><s>Management Skills</s>
MBA Survival Kit</td><td>4</td><td></td></tr>
<tr><td>BMA5901</td><td><s>Management Practicum</s>
MBA Consulting Project</td><td>4</td><td></td></tr>
<tr><td colspan="2">Total Core</td><td>12</td><td></td></tr>
<tr><td colspan="2">Total Elective</td><td>44</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 CODE</th><th>MODULE NAME</th><th>MC</th><th>REMARK</th></tr>
<tr><td rowspan="2">Core</td><td>BMA5001</td><td>Managerial Economics</td><td>4</td><td></td></tr>
<tr><td>BMA5003</td><td>Financial Accounting</td><td>4</td><td></td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

BMA5008	Financial Management	4	Recommend to take prior to finance electives
BMA5009	Marketing Management	4	Recommend to take prior to marketing electives
BMA5013	Corporate Strategy	4	Strongly recommended to take only after completing BMA5003 and BMA5009
BMA5016	Leading with Impact	4	
BMA5017	Managerial Operations and Analytics	4	
BMA5801	~~Management Communication~~ Launch Your Transformation	4	
BMA5802	~~Management Skills~~ MBA Survival Kit	4	
BMA5901	~~Management Practicum~~ MBA Consulting Project	4	
Total Core Requirements		**40**	
Total Elective Requirements		**16**	
Total MBA Requirements		**56**	

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/s3-asia-mba/

4.2.2.4 S3 Asia MBA

MODULE CODE	MODULE NAME	MC	REMARK
BMA5013	Corporate Strategy	4	Pre-requisite modules: BMA5003 & BMA5009. Students should have completed the equivalent modules at Fudan University & Korea University
BMA5901	~~Management Practicum~~ MBA Consulting Project	4	Compulsory for students opting to graduate with an NUS MBA degree
Total Core		**8**	
Total Elective		**14**	
Total Requirements for NUS		**22**	

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/the-nus-master-of-business-administration-master-in-public-policy-with-lee-kuan-yew-school-of-public-policy/

4.2.2.5 The NUS Master of Business Administration–Master in Public Policy (with Lee Kuan Yew School of Public Policy)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

NO MPP SPECIALIZATION	WITH MPP SPECIALIZATION		
MODULE CODE	**MODULE NAME**	**MC**	**MC**
BMA5003	Financial Accounting	4	4
BMA5008	Financial Management	4	4
BMA5009	Marketing Management	4	4
BMA5013	Corporate Strategy	4	4
BMA5016	Leading with Impact	4	4
BMA5017	Managerial Operations & Analytics	4	4
BMA5801	~~Management Communication~~ Launch Your Transformation	4	4
BMA5802	~~Management Skills~~ MBA Survival Kit	4	4
BMA5901	~~Management Practicum~~ MBA Consulting Project	4	not required
Total MBA Core		**36**	**32**
Total MBA Electives		**16**	**16**
Total MBA Requirement		**52**	**48**

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/the-nus-master-of-business-administration-master-in-public-administration-with-lee-kuan-yew-school-of-public-policy/

4.2.2.6 The NUS Master of Business Administration –Master in Public Administration (with Lee Kuan Yew School of Public Policy)

Graduation Requirements

		MODULE CODE	MODULE NAME	MC
MBA Modules	Core	BMA5003	Financial Accounting	4
		BMA5008	Financial Management	4
		BMA5009	Marketing Management	4
		BMA5013	Corporate Strategy	4
		BMA5016	Leading with Impact	4
		BMA5017	Managerial Operation & Analytics	4
		BMA5801	~~Management Communication~~ Launch Your Transformation	4
		BMA5802	~~Management Skills~~ MBA Survival Kit	4
		BMA5901	~~Management Practicum~~ MBA Consulting Project	4

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/the-nus-master-of-business-administration-master-of-advanced-management-double-degree-with-yale-school-of-management/

4.2.2.7 The NUS Master of Business Administration–Master of Advanced Management Double Degree (with Yale School of Management)

	MODULE CODE	MODULE NAME	MC	REMARK
Core	BMA5001	Managerial Economics	4	
	BMA5003	Financial Accounting	4	
	BMA5008	Financial Management	4	Recommend to take prior to finance electives
	BMA5009	Marketing Management	4	Recommend to take prior to marketing electives
	BMA5013	Corporate Strategy	4	Strongly recommended to take only after completing BMA5003 & BMA5009
	BMA5016	Leadership with Impact	4	
	BMA5017	Managerial Operations & Analytics	4	
	BMA5801	~~Management Communication~~ Launch Your Transformation	4	
	BMA5802	~~Management Skills~~ MBA Survival Kit	4	
	BMA5901	~~Management Practicum~~ MBA Consulting Project	4	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Total Core Requirements	**40**	
Total Elective Requirements	**4**	
Total MBA Requirements	**44**	

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/the-nus-mba-master-of-science-real-estate-mre-double-degree-programme/

4.2.2.8 The NUS MBA – Master of Science, Real Estate (MRE) Double Degree Programme

MBA Core

MODULE CODE	MODULE NAME	MC	REMARK
BMA5001	Managerial Economics	4	
BMA5003	Financial Accounting	4	
BMA5008	Financial Management	4	
BMA5009	Marketing Management	4	
BMA5013	Corporate Strategy	4	
BMA5016	Leading with Impact	4	
BMA5017	Managerial Operations and Analytics	4	
BMA5801	~~Management Communication~~ Launch Your Transformation	4	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

BMA5802	~~Management Skills~~ MBA Survival Kit	4	
Total Electives		**22**	

http://www.nus.edu.sg/nusbulletin/school-of-business/graduate-education/coursework-programmes/degree-requirements/phd-master-of-business-administration-with-nus-graduate-school-for-integrative-sciences-and-engineering/

4.2.2.9 PhD-Master of Business Administration (with NUS Graduate School for Integrative Sciences and Engineering)

	MODULE CODE	MODULE NAME	MC	REMARK
Core	BMA5001	Managerial Economics	4	
	BMA5003	Financial Accounting	4	
	BMA5008	Financial Management	4	Recommend to take prior to finance electives
	BMA5009	Marketing Management	4	Recommend to take prior to marketing electives
	BMA5013	Corporate Strategy	4	Strongly recommended to take only after completing BMA5003 and BMA5009
	BMA5016	Leading with Impact	4	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

	BMA5017	Managerial Operations and Analytics	4	
	BMA5801	~~Management Communication~~ Launch Your Transformation	4	
	BMA5802	~~Management Skills~~ MBA Survival Kit	4	
	BMA5901	~~Management Practicum~~ MBA Consulting Project	4	
	Total Core Requirements		**40**	
	Total Elective Requirements		**20**	
	Total MBA Requirements		**60**	

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td>7.</td><td>27 Jun 2019</td><td>SoC</td><td>NUS Bulletin 2019-2020 Update

http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-security-coop/

3.2.10 Bachelor of Computing in Information Security – Co-operative Education Programme

Reference Table 5: Summary of degree requirements for Bachelor of Computing (Information Security) – Co-operative Education Programme, the modular credits for Unrestricted Electives should be 20 instead of 32.

<table><tr><td>UNRESTRICTED ELECTIVES[6]</td><td></td><td>32 -> 20</td></tr></table></td></tr>
<tr><td>8.</td><td>27 Feb 2020</td><td>SoC</td><td>NUS Bulletin 2019-2020

http://www.nus.edu.sg/nusbulletin/school-of-computing/undergraduate-education/degree-requirements/bachelor-of-computing-in-information-security-coop/
Please update Table 5 as highlighted in red below:

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><s>108</s> ->120</td></tr><tr><td>Computing Foundation</td><td>36</td><td></td></tr><tr><td>CS1010 Programming Methodology [4]</td><td>4</td><td></td></tr></table></td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
			CS1231S 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	
			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 Either CS4236 Cryptography Theory and Practice; or MA4261 Coding and Cryptography CS4238 Computer Security Practice CS4239 Software Security CS4257 Algorithmic Foundations of Privacy CS4276 IoT Security	12	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

CS5231 Systems Security CS5321 Network Security CS5322 Database Security CS5331 Web Security IS4204 IT Governance CS5332 Biometric Authentication IFS4101 Legal Aspects of Information Security IFS4102 Digital Forensics IFS4103 Penetration Testing Practice IS4233 Legal Aspects of Information Technology IS4234 Compliance and Regulation Technology IS4302 Blockchain and Distributed Ledger Technologies Other modules approved by the SoC UG Office	
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~~
CP3880 Advanced Technology Attachment Programme Internship II	12
Co-operative Scheme Additional Requirements	**12**
IFS2200 Information Security Immersion Programme Internship I	6
IFS4202 Information Security Practicum Programme Part of Internship III	6
IT Professionalism	**8**
IS1103/X IS Innovations in Organisation and Society	4
CS2101 Effective Communication for Computing Professionals	4

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Mathematics</td><td>12</td><td></td></tr>
<tr><td>MA1101R Linear Algebra I</td><td>4</td><td></td></tr>
<tr><td>MA1521 Calculus for Computing</td><td>4</td><td></td></tr>
<tr><td>ST2334 Probability and Statistics[5]</td><td>4</td><td></td></tr>
<tr><td>UNRESTRICTED ELECTIVES[6]</td><td></td><td>20</td></tr>
<tr><td>Grand Total</td><td></td><td>160</td></tr>
</table>
[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 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.
[6] Students without A-level Mathematics are required to complete MA1301 or MA1301X Introductory Mathematics as part of the Unrestricted Electives.
</td></tr>
<tr><td>9.</td><td>2 Jul 2019</td><td>SCALE</td><td>3.4.2 Bachelor of Technology (Civil Engineering)

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

The BTech (Civil Engineering) programme is offered in partnership with the Department of Civil and Environmental Engineering beginning in August 2017. The curriculum for the part-time BTech Programme is formulated based on the current broad based full-time B.Eng. programme but with stronger emphasis on practice.</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			As this is a new programme, we are seeking accreditation from the Engineering Accreditation Board (EAB) of the Institution of Engineers Singapore (IES). We expect to be provisionally accredited for the first 2 years after the launch of the programme and full accreditation will be expected in about 3 years thereafter. With successful accreditation, all signatories in the Washington Accord will recognise the substantial equivalence of this programme in satisfying the academic requirements for the practice of engineering at the professional level in many countries including Canada, United States of America, United Kingdom, Hong Kong, New Zealand, Australia and others. The ***educational objectives*** of the programme are as follows: depth in fundamental knowledge of core civil engineering disciplines; breadth in integrative skills to apply the knowledge gained; appreciation of interactions between engineering, business and technology in modern society; drive for life-long learning and continuous self-development; and understanding of their role as civil engineers in the development of society at the national and global context. In addition, the programme ensures that graduates are equipped with the basic civil engineering core competencies to meet the requirements for the practice of civil engineering in Singapore in accordance to the Professional Engineers Board. The ***student learning outcomes*** are aligned to those required by the Engineering Accreditation Board on outcomes for civil engineering graduates and these are as follows: apply knowledge of mathematics, science and engineering; design and conduct experiments, analyse, interpret data and synthesise valid conclusions; design a system, component, or process, and synthesise solutions to achieve desired needs; identify, formulate, research through relevant literature review, and solve engineering problems reaching substantiated conclusions; use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints; communicate effectively; listening, writing and speaking skills; recognise the need for, and have the ability to engage in lifelong learning; understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development; function effectively within multidisciplinary teams and understand the fundamental precepts of effective project management; and understand professional, ethical and moral responsibility in the workplace. ***Degree Requirements*** Candidates must satisfy the following requirements to be conferred the degree of BTech (Civil Engineering): Complete a minimum of **160 MCs** with a minimum CAP of 2.00; (Note: 20 MCs of programme requirements and 20 MCs of unrestricted elective requirements will normally be given

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			as Advanced Placement Credits (APCs) to holders of relevant diploma or higher qualifications. Students will be required to complete a minimum of **120 MCs** of modules as listed below); Comply with the requirement that the limit on the number of Level-1000 modules to be counted towards fulfilment of graduation requirements being 60 MCs (including the 20 MCs of APCs); and Satisfy any other additional requirements that may be prescribed by SCALE, the Faculty of Engineering, or the University. **List of modules – BTech (Civil Engineering), comprise:** 1. All modules are 4MCs, except when otherwise stated. 2. A module with module code TCExxxx is equivalent to the module CExxxx, OTxxxx, ESExxxx and TPxxxx offered to the full-time students. Subject to the approval from SCALE and the Department of Civil & Environmental Engineering, a student may select a full-time equivalent module in place of any TCExxxx module. **University Level Requirements (20MCs)** Human Cultures (module with prefix GEH) Asking Questions (module with prefix GEQ) Quantitative Reasoning (module with prefix GER) Singapore Studies (module with prefix GES) Thinking and Expression (module with prefix GET) **Programme Requirements (100MCs), comprising** Faculty Requirements (8 MCs) TTG2415 Ethics in Engineering TTG2901 Communications for Engineering Professionals Major Requirements – Essential Modules (80MCs) TCE1109 Statics and Mechanics of Materials TTG1401 Engineering Mathematics I TCE2112 Soil Mechanics TCE2134 Hydraulics TCE2155 Structural Mechanics and Materials TCE2183 Construction Project Management TCE2184 Infrastructure & the Environment TME2401 Engineering Mathematics II TCE2407 Engineering & Uncertainty Analyses TCE3001 Water Quality Engineering TCE3115 Geotechnical Engineering

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			TCE3116 Foundation Engineering TCE3121 Transportation Engineering TCE3132 Water Resources Engineering TCE3155 Structural Analysis TCE3165 Structural Concrete Design TCE3166 Structural Steel Design and System TCE4103 Design Project TCE4104 BTech Dissertation (8MCs) <u>Major Requirements – Elective Modules (12MCs, selected from the list below)</u> Not all elective 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. Subject to the approval from SCALE and the Department of Civil and Environmental Engineering, a student may select one Level-3000 or higher module from other programmes within the Faculty of Engineering. *Construction* TCE4282 Building Information Modeling for Project Management TCE5604 Advanced Concrete Technology TCE5611 Precast Concrete Technology TCE5805 Construction Equipment and Methods *Environmental Engineering and Hydraulics* TCE4247 Treatment Plant Hydraulics TCE4401 Water & Wastewater Engineering 2 TCE4408 Environmental Impact Assessment *Geotechnical Engineering* TCE5106 Ground Improvement TCE5107 Pile Foundations TCE5108 Earth Retaining Structures TCE5113 Geotechnical Investigation & Monitoring *Offshore Engineering* TCE5202 Analysis & Design of Offshore Structures TCE5206 Offshore Foundations *Structural Engineering* TCE4257 Linear Finite Element Analysis TCE4258 Structural Stability & Dynamics

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
TCE5509 Advanced Structural Steel Design
TCE5510 Advanced Structural Concrete Design
Transportation Engineering
TCE4221 Design of Land Transport Infrastructures
TCE5025 Intelligent Transportation Systems
TCE5026 Transportation Management & Policy

Study Schedule
There is only one intake per academic year in Semester 1 (i.e. August). 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 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.

<table>
<tr><th colspan="2">1st Year of studies</th></tr>
<tr><td>Sem 1:</td><td>TCE1109 Statics and Mechanics of Materials (4)
TCE2112 Soil Mechanics (4)
TCE2155 Structural Mechanics and Materials (4)</td></tr>
<tr><td>Sem 2:</td><td>TCE2134 Hydraulics (4)
TCE3115 Geotechnical Engineering (4)
TTG1401 Engineering Mathematics I (4)</td></tr>
<tr><td>SpTerm:</td><td>General Education Module 1 (4)
General Education Module 2 (4)</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			2nd Year of studies
			Sem 1: TCE2183 Construction Project Management (4) TCE2184 Infrastructure & the Environment (4) TME2401 Engineering Mathematics II (4)
			Sem 2: TCE3116 Foundation Engineering (4) TCE3165 Structural Concrete Design (4) TCE3166 Structural Steel Design and System (4)
			SpTerm: General Education Module 3 (4) TCE2407 Engineering & Uncertainty Analyses (4)
			3rd Year of studies
			Sem 1: TCE3001 Water Quality Engineering (4) TCE3132 Water Resources Engineering (4) TCE3155 Structural Analysis (4)
			Sem 2: TTG2901 Communications for Engineering Professionals (4) TCE3121 Transportation Engineering (4) General Education Module 4 (4) (module with prefix GET)
			SpTerm: General Education Module 5 (4) TTG2415 Ethics in Engineering (4)

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td colspan="2">4th Year of studies</td></tr>
<tr><td>Sem 1:</td><td>TCE4103 Design Project (4)
*TCE4104 BTech Dissertation
Elective Module 1 (4)</td></tr>
<tr><td>Sem 2:</td><td>*TCE4104 BTech Dissertation (8)
Elective Module 2 (4)
Elective Module 3 (4)</td></tr>
</table>
</td></tr>
<tr><td>10.</td><td>2 Jul 2019</td><td>SCALE</td><td>3.4.3 Bachelor of Technology (Electronics Engineering)

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

The BTech (Electronics Engineering) is offered in partnership with the Department of Electrical & Computer Engineering. The programme aims to graduate professional electronics engineers who have a strong foundation in the relevant sciences and technology and who are able to contribute to society through innovation, enterprise and leadership. The programme provides students with an education that enhances and complements their knowledge and experiences, offers the requisite balance of breadth and depth for a professional electrical engineering education, and seeks to establish a solid foundation for lifelong learning throughout an electronics engineer’s career.

The programme comprises of three components – a strong core in mathematics, computing and engineering; technical competence through a minimum of breadth and depth modules; and general education. The core – which includes group projects, a product design and innovations project, and individual research and design projects –</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			provides knowledge and skills considered essential for electronics engineers. A minimum number of breadth modules ensures that each student is exposed to many aspects of the state-of-the-art areas; in addition, students can achieve depth in one or two areas of their choice. General education modules complement the technical education through a wide array of modules in humanities, social sciences and professionalism to make our graduates educated members of the global community. The programme is accredited by the Engineering Accreditation Board (EAB) of the Institution of Engineers Singapore (IES). Via this accreditation, all signatories in the Washington Accord recognise the substantial equivalence of this programme in satisfying the academic requirements for the practice of engineering at the professional level in many countries including Canada, United States of America, United Kingdom, Hong Kong, New Zealand, Australia and others. The structure of the BTech (Electronics Engineering) programme is designed to achieve the following ***educational objectives*** to prepare engineers who will have the following attributes: **Technical Skills**: are technically competent to solve complex problems in electronics engineering and can adapt effectively in a fast changing environment. **Critical Thinking**: are able to critically think, analyse and make decisions that give due consideration to global issues in business, ethics, society and the environment. **Leadership & Team Building**: are able to communicate effectively, act with integrity, and have the inter-personal skills needed to engage in, lead, and nurture diverse teams. **Attitude**: are committed to lifelong learning, resourceful, resilient and embrace global challenges and opportunities to make a positive impact in society. The above objectives are achieved by a curriculum designed to graduate students who have attained the following ***learning outcomes***: **Engineering knowledge:** Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Problem Analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. **Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. **Investigation:** Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. **The engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and economic decision-making, and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. **Life-long Learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. **EE Specific Programme Criteria:** Have the knowledge to analyse and design complex electronic devices, software, and systems containing hardware and software components; and understand the principles and applications of the basic sciences, engineering science and advanced mathematics, including probability and statistics, differential and integral calculus, linear algebra and complex variables. ***Degree Requirements*** Candidates must satisfy the following requirements to be conferred the degree of BTech (Electronics Engineering): • Complete a minimum of **160 MCs** with a minimum CAP of 2.00; (Note: 20 MCs of programme requirements and 20 MCs of unrestricted elective requirements will normally be

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			given as Advanced Placement Credits (APCs) to holders of relevant diploma or higher qualifications. Students will be required to complete a minimum of **120 MCs** of modules as listed below.) • Comply with the requirement that the limit on the number of Level-1000 modules to be counted towards fulfilment of graduation requirements being 60 MCs (including the 20 MCs of APCs); and • Satisfy any other additional requirements that may be prescribed by SCALE, the Faculty of Engineering, or the University. **List of modules – BTech (Electronics Engineering), comprise:** 1. All modules are 4MCs, except when otherwise stated. 2. A module with module code TEExxxx is equivalent to the module EExxxx offered to the full-time students. Subject to the approval from SCALE and the Department of Electrical and Computer Engineering, a student may select a full-time equivalent module in place of any TEExxxx module. **University Level Requirements (20MCs)** Human Cultures (module with prefix GEH) Asking Questions (module with prefix GEQ) Quantitative Reasoning (module with prefix GER) Singapore Studies (module with prefix GES) Thinking and Expression (module with prefix GET) **Programme Requirements (84MCs), comprising** A. 1. Faculty Requirements (4MCs) • TTG2415 Ethics in Engineering 2. Major Requirements – Essential Modules (60MCs) • TTG1401 Engineering Mathematics I • TEE2002 Engineering Mathematics II • TEE2003 Advanced Mathematics for Engineers • TEE2011 Engineering Electromagnetics • TEE2023 Signals & Systems • TEE2026 Digital Design • TEE2027 Electronic Circuits • TEE2028 Microcontroller Programming and Interfacing • TEE2033 Integrated System Lab

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• TEE2101 Programming Methodology • TEE3031 Innovation & Enterprise I • TEE3506 Electrical Energy Systems • TEE4001 BTech Dissertation (12MCs) 3. Major Requirements – Elective Modules (20MCs, selected from the list below) Not all elective 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. Unless approval for exemption is obtained from SCALE and the Department of Electrical and Computer Engineering, a student must read at least ~~three~~ two Level-4000 electives and three ~~outer core~~ other electives ~~(from: TEE3013, TEE3104, TEE3131, TEE3331, TEE3431, TEE3408, TEE3501, TEE3731 and TEE3201)~~ selected from the list below. *Communications* • ~~TEE3104 Introduction to RF and Microwave Systems & Circuits~~ • TEE3131 Communication Systems • ~~TEE3731 Signal Processing Methods~~ • TEE4101 RF Communications • ~~TEE4112 Radio Frequency Design and Systems~~ • ~~TEE4113 Digital Communications and Coding~~ *Computer Engineering* • TEE3201 Software Engineering • ~~TEE3207 Computer Architecture~~ • ~~TEE3208 Embedded Computer Systems Design~~ • ~~TEE3731 Signal Processing Methods~~ • TEE4204 Computer Networks • TEE4210 Network Protocols and Applications

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			~~• TEE4214 Real-Time Embedded Systems~~ ~~• TEE4704 Introduction to Computer Vision and Image Processing~~ *Microelectronics* ~~• TEE3408 Integrated Analog Design~~ ~~• TEE3431 Microelectronics Materials and Devices~~ ~~• TEE4415 Integrated Digital Design~~ ~~• TEE4435 Modern Transistors and Memory Devices~~ • TEE4407 Analog Electronics • TEE4436 Fabrication Process Technology *General* • TIE2130 Quality Engineering I ~~• TEE3013 Labview for Electrical Engineers~~ • TEE3331 Feedback Control Systems • TEE3501 Power Electronics ~~• TEE4303 Industrial Control Systems~~ • TEE4305 Introduction to Fuzzy/Neural Systems • TEE4211 Data Science for the Internet of Things ~~• TEE3801 Robust Design of Electronic Circuits~~ • TME4245 Robot Mechanics and Control **Unrestricted Elective Modules (16MCs)** ***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'

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
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.

<table>
<tr><td colspan="2">1st Year of studies</td></tr>
<tr><td>Sem 1:</td><td>General Education Module 1 (4)
TTG1401 Engineering Mathematics I (4)
TEE2027 Electronic Circuits (4)</td></tr>
<tr><td>Sem 2:</td><td>TEE2002 Engineering Mathematics II (4)
TEE2026 Digital Design (4)
TEE2101 Programming Methodology (4)</td></tr>
<tr><td>SpTerm:</td><td>General Education Module 2 (4)
General Education Module 3 (4)</td></tr>
<tr><td colspan="2">2nd Year of studies</td></tr>
<tr><td>Sem 1:</td><td>TEE2003 Advanced Mathematics for Engineers (4)
TEE2028 Microcontroller Programming and Interfacing (4)
General Education Module 4 (4)</td></tr>
<tr><td>Sem 2:</td><td>TEE2011 Engineering Electromagnetics (4)
TEE2023 Signals & Systems (4)
Unrestricted Elective (4)</td></tr>
<tr><td>SpTerm:</td><td>General Education Module 5 (4)</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 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td colspan="2">3rd Year of studies</td></tr>
<tr><td>Sem 1:</td><td>*TTG3002 Industrial Practice
Elective Module 1 (4)
Elective Module 2 (4)
Unrestricted Elective Module (4)</td></tr>
<tr><td>Sem 2:</td><td>*TTG3002 Industrial Practice (8)
TEE2033 Integrated System Lab (4)
TEE3031 Innovation & Enterprise I (4)
Elective Module 3 (4)</td></tr>
<tr><td>SpTerm:</td><td>TTG2415 Ethics in Engineering (4)
TEE3506 Electrical Energy Systems (4)</td></tr>
<tr><td colspan="2">4th Year of studies</td></tr>
<tr><td>Sem 1:</td><td>*TEE4001 BTech Dissertation
Elective Module 4 (4)
Elective Module 5 (4)</td></tr>
<tr><td>Sem 2:</td><td>*TEE4001 BTech Dissertation (12)
<s>Elective 6</s></td></tr>
</table>
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
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 2:	TEE2026 Digital Design (4) TEE2101 Programming Methodology (4) TTG1401 Engineering Mathematics I (4)
			SpTerm:	General Education Module 1 (4) General Education Module 2 (4)
			Sem 1:	General Education Module 3 (4) TEE2002 Engineering Mathematics II (4) TEE2027 Electronic Circuits (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:	General Education Module 5 (4) TEE2028 Microcontroller Programming and Interfacing (4) *TTG3002 Industrial Practice Unrestricted Elective Module (4)
			3rd Year of studies	
			Sem 2:	TEE2033 Integrated System Lab (4) TEE3031 Innovation & Enterprise I (4) *TTG3002 Industrial Practice (8) Elective Module 1 (4)
			SpTerm:	TTG2415 Ethics in Engineering (4) TEE3506 Electrical Energy Systems (4)

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Sem 1:</td><td>Elective Module 2 (4)
Elective Module 3 (4)
Unrestricted Elective Module (4)</td></tr>
<tr><td colspan="2">4th Year of studies</td></tr>
<tr><td>Sem 2:</td><td>*TEE4001 BTech Dissertation
Elective Module 4 (4)
Elective Module 5 (4)</td></tr>
<tr><td>SpTerm:</td><td>*TEE4001 BTech Dissertation</td></tr>
<tr><td>Sem 1:</td><td>*TEE4001 BTech Dissertation (12)
<s>Elective Module 6 (4)</s></td></tr>
</table>
</td></tr>
<tr><td>11.</td><td>5 Jul 2019</td><td>SCALE</td><td>2.Key Contact Information
http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/
https://scale.nus.edu.sg/about-us/contact-us.html --> outdated website

https://scale.nus.edu.sg/contact/contact-us</td></tr>
<tr><td>12.</td><td>8 Jul 2019</td><td>SCALE</td><td>3.4.6 Bachelor of Technology (Supply Chain Management)

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

Bachelor of Technology (Supply Chain Management)

The BTech (Supply Chain Management) programme is building on the suite of five existing BTech programmes (Electronics Engineering, Mechanical Engineering, Chemical Engineering, Industrial & Management Engineering and Civil Engineering) offered by the School of Continuing and Lifelong Education (SCALE) and the Faculty of Engineering in NU S. The programme will provide an avenue for suitably qualified polytechnic diploma holders who are currently employed to pursue a part-time degree at NUS, while allowing them to stay economically productive during the course. The part-time programme will marry key components from the broad-based full-time Bachelor of Engineering (BEng)</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			(ISE) programme with essential elements of strong industry relevance that will be immediately useful in the workplace. In this way, it will fulfil the strong aspiration of the growing number of capable polytechnic graduates to obtain a degree without the need to go overseas or give up their jobs. The BTech (Supply Chain Management) programme is aligned with the Faculty's educational philosophy which emphasises the learning of scientific fundamentals of engineering as a foundation for proficient and innovative practice. Interactive classroom lectures are augmented by hands-on laboratory sessions and design and research experience. The ***educational objectives*** of the programme are as follows: • A deep fundamental knowledge of core supply chain management, supply chain engineering and general business disciplines such as international trade law; • Broad integrative skills to apply the knowledge gained; • An appreciation of the interactions between modern logistics and supply chains, with engineering, business and technology in modern society; • A drive for life-long learning and continuous self-development; and • An understanding of their roles as supply chain analysts/ engineers in the development of Singapore society at the national and global levels. In addition, the programme ensures that our graduates are equipped with the necessary logistics and supply chain management and engineering core competencies to meet the requirements for the practice of engineering in Singapore as stipulated by the Professional Engineers Board. The ***student learning outcomes*** are aligned to those required by the Engineering Accreditation Board on outcomes for engineering graduates and these are as follows: • Apply knowledge of mathematics, science and engineering to logistics and supply chain management; • Design and conduct experiments, analyse, interpret data and synthesise valid conclusions; • Design a system, component, or process, and synthesise solutions to achieve desired needs; • Identify and formulate research through relevant literature review, and solve engineering problems with substantiated conclusions; • Use the techniques, skills and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints; • Communicate effectively (including listening, writing and speaking skills);

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• Recognise the need for, and have the ability to engage in life-long learning; • Understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development; • Function effectively within multidisciplinary teams and understand the fundamental precepts of effective logistical and supply chain related project management; and • Understand professional, ethical and moral responsibilities in the workplace. **Degree Requirements** Candidates must satisfy the following requirements to be conferred the degree of BTech (Supply Chain Management): • Complete a minimum of **160 MCs** with a minimum CAP of 2.00; (Note: 20 MCs of programme requirements and 20 MCs of unrestricted elective requirements will normally be given as Advanced Placement Credits (APCs) to holders of relevant diploma or higher qualifications. Students will be required to complete a minimum of **120 MCs** of modules as listed below.) • Comply with the requirement that the limit on the number of Level-1000 modules to be counted towards fulfilment of graduation requirements being 60 MCs (including the 20 MCs of APCs); and, • Satisfy any other additional requirements that may be prescribed by SCALE, the Faculty of Engineering, or the University. **List of modules – BTech (Supply Chain Management), comprise:** 1. All modules are 4MCs, except when otherwise stated. 2. A module with module code TIExxxx is equivalent to the module IExxxx offered to full-time students. Subject to the approval from SCALE and the Department of Industrial Systems Engineering and Management, a student may select a full-time equivalent module in place of any TIExxxx module. **A. <u>University Level Requirements (20MCs)</u>** • Quantitative Reasoning (module with prefix GER) • Thinking and Expression (module with prefix GET) • Human Cultures (module with prefix GEH) • Asking Questions (module with prefix GEQ) • Singapore Studies (module with prefix GES)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			B. <u>Programme Requirements (88MCs), comprising</u> 1. <u>Faculty Requirements (4MCs)</u> • TTG2415 Ethics in Engineering 2. <u>Major Requirements – Essential Modules (68MCs)</u> • TTG1401 Engineering Mathematics I • TIE2020 Probability and Statistics • TIE2030 Programming Methodology with Python • TIE2100 Probability Models with Applications • TIE2110 Operations Research I • TIE2140 Engineering Economy • TIE3101 Statistics for Engineering Applications • TIE4220 Supply Chain Modelling • TSC3100 Systems Chain Design (8MCs) • TSC3222 Global Sourcing and Supply Management • TSC3223 Supply Chain Financial Analysis and Management • TSC3224 Distribution and Warehousing • TSC3226 Transportation Management • TSC4101 BTech Dissertation (8MCs) • TSC4225 Port Logistics 3. <u>Major Requirements – Elective Modules (16MCs or 17MCs, select from the list below)</u> a) A student who reads 17 MCs under the Electives may have his/ her UEM requirements reduced to 11 MCs b) *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. Subject to the approval from SCALE and the Department of Industrial Systems Engineering and Management, a student may select one Level-3000 or higher module from other programmes within the Faculty of Engineering.* • TIE3010 Systems Thinking and Design • TIE3110 Simulation (5MCs) • TIE4242 Cost Analysis and Management

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>

TIE4240 Project Management
TIE4203 Decision Analysis in Industrial & Operations Management
TIE4212 Advanced Modeling in Operations Management
TIE4252 Introduction to Systems Engineering
TIE4229 Selected Topics in Logistics
TIE4249 Selected Topics in Engineering Management
TIE4259 Selected Topics in Systems Engineering
TIE4299 Selected Topics in Industrial Engineering

C. <u>Unrestricted Elective Modules (12MCs)</u>

Study Schedule

There are two intakes per academic year, in Semester 1 (i.e. August) and Semester 2 (i.e. January). The sample study schedule 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.

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.

<table>
<tr><th colspan="2">1st Year of studies</th></tr>
<tr><td>Sem 1:</td><td>TTG1401 Engineering Mathematics I (4)
TIE2030 Programming Methodology with Python (4)
TIE2110 Operations Research I (4)</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 2:	TIE2020 Probability & Statistics (4) TIE2100 Probability Models with Applications (4) TIE2140 Engineering Economy (4)
			SpTerm:	General Education Module 1 (4) General Education Module 2 (4)
			2nd Year of studies	
			Sem 1:	TIE3101 Statistics for Engineering Application (4) TSC3223 Supply Chain Financial Analysis & Management (4) Elective Module 1 (4)
			Sem 2:	TIE4220 Supply Chain Modelling (4) TSC3222 Global Sourcing & Supply Management (4) Elective Module 2 (4)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			SpTerm : TTG2415 Ethics in Engineering (4) General Education 3 (4)
			3rd Year of studies
			Sem 1: TSC3226 Transportation Management *TSC3100 Systems Chain Design *TTG3001 Industrial Practice
			Sem 2: TSC3224 Distribution and Warehousing *TSC3100 Systems Chain Design (8MCs) *TTG3001 Industrial Practice (12MC)
			SpTerm : General Education 4 (4) General Education 5 (4)
			4th Year of studies
			Sem 1: TSC4225 Port Logistics (4) *TSC4101 BTech Dissertation Elective Module 3 (4)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Sem 2:	*TSC4101 BTech Dissertation (8) Elective Module 4 (4)

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) TIE2020 Probability & Statistics (4) TIE2140 Engineering Economy (4)
SpTerm:	General Education Module 1 (4) General Education Module 2 (4)
Sem 1:	TIE2030 Programming Methodology with Python (4)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
				TIE2110 Operations Research I (4) TIE3101 Statistics for Engineering Application (4)
			2nd Year of studies	
			Sem 2:	TIE2100 Probability Models with Applications (4) TSC3222 Global Sourcing & Supply Management (4) TIE4220 Supply Chain Modelling (4)
			SpTerm:	TTG2415 Ethics in Engineering (4) General Education 3 (4)
			Sem 1:	TSC3223 Supply Chain Financial Analysis & Management (4) TSC3226 Transportation Management (4) *TTG3001 Industrial Practice
			3rd Year of studies	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 2:	*TSC3100 Systems Chain Design TSC3224 Distribution and Warehousing (4) *TTG3001 Industrial Practice (12MC)
			SpTerm:	General Education 4 (4) General Education 5 (4) *TSC3100 Systems Chain Design
			Sem 1:	TSC4225 Port Logistics (4) *TSC3100 Systems Chain Design (8MCs) Elective Module 1 (4)
			4th Year of studies	
			Sem 2:	*TSC4101 BTech Dissertation Elective Module 2 (4)
			SpTerm:	*TSC4101 BTech Dissertation Elective Module 3 (4)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Sem 2: *TSC4101 BTech Dissertation (8) Elective Module 4 (4)
13.	12 Nov 2019	SCALE	Please assist to update SCALE Bulletin as below. (Link: http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-chemical-engineering/) **Amendments are in Red.** **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**

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Sem 1:	TTG1401 Engineering Mathematics 1 (4) TCN1005 MATLAB Programming for Chemical Engineers (4) GE Requirements 1 (4)
Sem 2:	TCN1422 Materials for Chemical Engineers (4) TCN1111 Chemical Engineering Principles (4) GE Requirements 2 (4)
SpTerm:	TCN2411 Mathematics for Chemical Engineers 2 (4) GE Requirements 3 (4)
2nd Year of studies	
Sem 1:	GE Requirements 4 (4) TCN2121 Chemical Engineering Thermodynamics (4) TCN2122 Fluid Mechanics (4)
Sem 2:	TCN2116 Chemical Kinetics & Reactor Design (4) TCN2125 Heat and Mass Transfer (4) TCN3124 Particle Technology (4)
SpTerm:	TCN3135 Process Safety, Health and Environment (3) GE Requirements 5 (4)
3rd Year of studies	
Sem 1:	TCN3121 Process Dynamics & Control (4) TCN3132 Separation Processes (5) TCN3421 Process Modeling & Numerical Simulation (4)
Sem 2:	*TCN4119 BTech Dissertation /Technical Elective Module (4) Technical Elective Module 1 (4) Technical Elective Module 2 (4)
SpTerm:	TTG2415 Ethics in Engineering (4) *TCN4119 BTech Dissertation

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

4th Year of studies	
Sem 1:	*TCN4119 BTech Dissertation (8) /Technical Elective Module (4) TCN4122 Process Synthesis and Simulation (3) *TTG3001 Industrial Practice /Unrestricted Elective Module (4)
Sem 2:	*TCN4124 Final Year Design Project *TTG3001 Industrial Practice /Unrestricted Elective Module (4) Technical Elective Module 3 (4)
SpTerm:	*TCN4124 Final Year Design Project (6) *TTG3001 Industrial Practice (12) /Unrestricted Elective Module (4)

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:	TCN1111 Chemical Engineering Principles (4) TTG1401 Engineering Mathematics 1 (4) TCN1422 Materials for Chemical Engineers (4)
SpTerm:	General Education Module 1 (4) TCN2411 Mathematics for Chemical Engineers 2 (4)
Sem 1:	TCN1005 MatLab Programming for Chemical Engineers (4) TCN2121 Chemical Engineering Thermodynamics (4) TCN2122 Fluid Mechanics (4)
2nd Year of studies	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 2:	TCN2116 Chemical Kinetics & Reactor Design (4) TCN2125 Heat and Mass Transfer (4) TCN3124 Particle Technology (4)
			SpTerm:	General Education Module 2 (4) TCN3135 Process Safety, Health and Environment (3)
			Sem 1:	TCN3121 Process Dynamics & Control (4) TCN3132 Separation Processes (5) TCN3421 Process Modelling & Numerical Simulation (4)
			3rd Year of studies	
			Sem 2:	General Education Module 3 (4) *TCN4119 BTech Dissertation / Elective Module (4) Elective Module 1 (4)
			SpTerm:	General Education Module 4 (4) TTG2415 Ethics in Engineering (4) *TCN4119 BTech Dissertation
			Sem 1:	*TTG3001 Industrial Practice / Unrestricted Elective Module (4) *TCN4119 BTech Dissertation (8) / Elective Module (4) TCN4122 Process Synthesis and Simulation (3)
			4th Year of studies	
			Sem 2:	General Education Module 5 (4) *TTG3001 Industrial Practice (12) / Unrestricted Elective Module (4) *TCN4124 Final Year Design Project
			SpTerm:	*TCN4124 Final Year Design Project (6) Unrestricted Elective Module (4)
			Sem 1:	Elective Module 2 (4) Elective Module 3 (4)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
14.	8 Oct 2019	SCALE	Please assist to update SCALE Bulletin as below. (Link: http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-civil-engineering/) Below is what you see in the current bulletin page: The ***educational objectives*** of the programme are as follows: • depth in fundamental knowledge of core civil engineering disciplines; • breadth in integrative skills to apply the knowledge gained; • appreciation of interactions between engineering, business and technology in modern society; • drive for life-long learning and continuous self-development; and • understanding of their role as civil engineers in the development of society at the national and global context. **Please assist to amend accordingly as highlighted in yellow below:** • depth in fundamental knowledge of core civil engineering disciplines; • breadth in integrative skills to apply knowledge across disciplines; • appreciation of interactions between engineering, business and technology in modern society; • drive for life-long learning and continuous self-development; • understanding of their role as civil engineers in the sustainable developments of society at the national and global context; and • to ensure that our graduates are equipped with the basic civil engineering core competencies to meet the requirements for the practice of civil engineering in Singapore in accordance to the Professional Engineers Board.
15.	29 Oct 2019	SCALE	To update SCALE Bulletin as below. (Link: http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-chemical-engineering/) **To replace TCN 1411 with TTG1401. (please see below amendments in red)** 2. Major Requirements – Essential Modules (65MCs)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			TCN1005 MatLab Programming for Chemical Engineers TCN1111 Chemical Engineering Principles ~~**TCN1411 Mathematics for Chemical Engineers 1**~~ TTG1401 Engineering Mathematics 1 TCN1422 Materials for Chemical Engineers TCN2116 Chemical Kinetics and Reactor Design TCN2121 Chemical Engineering Thermodynamics TCN2122 Fluid Mechanics TCN2125 Heat and Mass Transfer TCN2411 Mathematics for Chemical Engineers 2 TCN3121 Process Dynamics and Control TCN3124 Particle Technology TCN3132 Separation Processes (5MCs) TCN3135 Process Safety, Health and Environment (3MCs) TCN3421 Process Modelling & Numerical Simulation TCN4122 Process Synthesis and Simulation (3MCs) TCN4124 Design Project (6MCs) ***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.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>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>TCN1111 Chemical Engineering Principles (4)
<s>TCN1411 Mathematics for Chemical Engineers 1 (4)</s> TTG1401 Engineering Mathematics 1 (4)
TCN1422 Materials for Chemical Engineers (4)</td></tr>
<tr><td>SpTerm:</td><td>General Education Module 1 (4)
TCN2411 Mathematics for Chemical Engineers 2 (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>
</table></td></tr>
<tr><td>16.</td><td>14 Aug 2019</td><td>SCALE</td><td>Please update SCALE’s NUS Bulletin on the following (the additional paragraph is in red below):

Home / NUS Bulletin AY2019/20 / School of Continuing and Lifelong Education / Undergraduate Education / Financial Assistance:
http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/financial-assistance/

Under Para 3.5 Financial Assistance (after para B), please add the following para C (in red).

B. Singapore Digital Scholarship (Undergraduate)

Eligible students who are enrolled in BTech (Business Analytics), BTech (Cybersecurity) and BTech (Software Engineering) programmes may apply. Please visit this link for more information and enquiries: https://www.imda.gov.sg/imtalent/programmes/sgd-undergraduate.

C. BCA-Industry Built Environment Undergraduate Sponsorship (for part-time degree)

For eligible students who are enrolled in the BTech (Civil Engineering), this programme co-funds the undergraduate sponsorship offered by industry firms to upgrade and retain their high potential local employees, whom the firms wish</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			to groom to take up higher management and professional roles within the built environment sector. For more information and enquiries, please visit this website: https://www.bca.gov.sg/workforce/besp.html.
17.	19 Aug 2019	SCALE	3.4.3 Bachelor of Technology (Electronics Engineering) http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/btech-engineering/bachelor-of-technology-electronics-engineering/ The BTech (Electronics Engineering) is offered in partnership with the Department of Electrical & Computer Engineering. The programme aims to graduate professional electronics engineers who have a strong foundation in the relevant sciences and technology and who are able to contribute to society through innovation, enterprise and leadership. The programme provides students with an education that enhances and complements their knowledge and experiences, offers the requisite balance of breadth and depth for a professional electrical engineering education, and seeks to establish a solid foundation for lifelong learning throughout an electronics engineer's career. The programme comprises of three components – a strong core in mathematics, computing and engineering; technical competence through a minimum of breadth and depth modules; and general education. The core – which includes group projects, a product design and innovations project, and individual research and design projects – provides knowledge and skills considered essential for electronics engineers. A minimum number of breadth modules ensures that each student is exposed to many aspects of the state-of-the-art areas; in addition, students can achieve depth in one or two areas of their choice. General education modules complement the technical education through a wide array of modules in humanities, social sciences and professionalism to make our graduates educated members of the global community. The programme is accredited by the Engineering Accreditation Board (EAB) of the Institution of Engineers Singapore (IES). Via this accreditation, all signatories in the Washington Accord recognise the substantial equivalence of this programme in satisfying the academic requirements for the practice of engineering at the professional level in many

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			countries including Canada, United States of America, United Kingdom, Hong Kong, New Zealand, Australia and others. The structure of the BTech (Electronics Engineering) programme is designed to achieve the following ***educational objectives*** to prepare engineers who will have the following attributes: **Technical Skills**: are technically competent to solve complex problems in electronics engineering and can adapt effectively in a fast changing environment. **Critical Thinking**: are able to critically think, analyse and make decisions that give due consideration to global issues in business, ethics, society and the environment. **Leadership & Team Building**: are able to communicate effectively, act with integrity, and have the inter-personal skills needed to engage in, lead, and nurture diverse teams. **Attitude**: are committed to lifelong learning, resourceful, resilient and embrace global challenges and opportunities to make a positive impact in society. The above objectives are achieved by a curriculum designed to graduate students who have attained the following ***learning outcomes***: **Engineering knowledge:** Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems. **Problem Analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. **Design/development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations. **Investigation:** Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations. **The engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice. **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and economic decision-making, and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. **Life-long Learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. **EE Specific Programme Criteria:** Have the knowledge to analyse and design complex electronic devices, software, and systems containing hardware and software components; and understand the principles and applications of the basic sciences, engineering science and advanced mathematics, including probability and statistics, differential and integral calculus, linear algebra and complex variables. ***Degree Requirements*** Candidates must satisfy the following requirements to be conferred the degree of BTech (Electronics Engineering): • Complete a minimum of **160 MCs** with a minimum CAP of 2.00; (Note: 20 MCs of programme requirements and 20 MCs of unrestricted elective requirements will normally be given as Advanced Placement Credits (APCs) to holders of relevant diploma or higher qualifications. Students will be required to complete a minimum of **120 MCs** of modules as listed below.) • Comply with the requirement that the limit on the number of Level-1000 modules to be counted towards fulfilment of graduation requirements being 60 MCs (including the 20 MCs of APCs); and • Satisfy any other additional requirements that may be prescribed by SCALE, the Faculty of Engineering, or the University. **List of modules – BTech (Electronics Engineering), comprise:** 1. All modules are 4MCs, except when otherwise stated. 2. A module with module code TEExxxx is equivalent to the module EExxxx offered to the full-time students. Subject

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			to the approval from SCALE and the Department of Electrical and Computer Engineering, a student may select a full-time equivalent module in place of any TEExxxx module. **<u>University Level Requirements (20MCs)</u>** Human Cultures (module with prefix GEH) Asking Questions (module with prefix GEQ) Quantitative Reasoning (module with prefix GER) Singapore Studies (module with prefix GES) Thinking and Expression (module with prefix GET) **<u>Programme Requirements (84MCs), comprising</u>** A. 1. <u>Faculty Requirements (4MCs)</u> • TTG2415 Ethics in Engineering 2. <u>Major Requirements – Essential Modules (60MCs)</u> • TTG1401 Engineering Mathematics I • TEE2002 Engineering Mathematics II • TEE2003 Advanced Mathematics for Engineers • TEE2011 Engineering Electromagnetics • TEE2023 Signals & Systems • TEE2026 Digital Design • TEE2027 Electronic Circuits • TEE2028 Microcontroller Programming and Interfacing • TEE2033 Integrated System Lab • TEE2101 Programming Methodology • TEE3031 Innovation & Enterprise I • TEE3506 Electrical Energy Systems

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• TEE4001 BTech Dissertation (12MCs) 3. Major Requirements – Elective Modules (20MCs, selected from the list below) Not all elective 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. Unless approval for exemption is obtained from SCALE and the Department of Electrical and Computer Engineering, a student must read at least Level-4000 electives and three electives selected from the list below. *Communications* • TEE3131 Communication Systems • TEE4101 RF Communications *Computer Engineering* • TEE3201 Software Engineering • TEE4204 Computer Networks • TEE4210 Network Protocols and Applications *Microelectronics* • TEE4407 Analog Electronics • TEE4436 Fabrication Process Technology *General* • TIE2130 Quality Engineering I

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• TEE3331 Feedback Control Systems • TEE3501 Power Electronics • TEE4305 Introduction to Fuzzy/Neural Systems • TEE4211 Data Science for the Internet of Things • TME4245 Robot Mechanics and Control **<u>Unrestricted Elective Modules (16MCs)</u>** ***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 (4) TTG1401 Engineering Mathematics I (4) TEE2027 Electronic Circuits (4)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 2:	TEE2002 Engineering Mathematics II (4) TEE2026 Digital Design (4) TEE2101 Programming Methodology (4)
			SpTerm :	General Education Module 2 (4) ~~TEE3506 Electrical Energy Systems (4)~~ General Education Module 3 (4)
			2nd Year of studies	
			Sem 1:	TEE2003 Advanced Mathematics for Engineers (4) TEE2028 Microcontroller Programming and Interfacing (4) ~~General Education Module 3 (4)~~ TEE3506 Electrical Energy Systems (4)
			Sem 2:	TEE2011 Engineering Electromagnetics (4) TEE2023 Signals & Systems (4) Unrestricted Elective (4)
			SpTerm :	General Education Module 4 (4) ~~General Education Module 5 (4)~~
			3rd Year of studies	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 1:	*TTG3002 Industrial Practice Elective Module 1 (4) Elective Module 2 (4) ~~Unrestricted Elective Module (4)~~ General Education Module 5 (4)
			Sem 2:	*TTG3002 Industrial Practice (8) TEE2033 Integrated System Lab (4) TEE3031 Innovation & Enterprise I (4) Elective Module 3 (4)
			SpTerm : 	TTG2415 Ethics in Engineering (4)
			4th Year of studies	
			Sem 1:	*TEE4001 BTech Dissertation Elective Module 4 (4) Elective Module 5 (4)
			Sem 2:	*TEE4001 BTech Dissertation (12) Unrestricted Elective Module (4)
			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.	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			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:	TEE2026 Digital Design (4) TEE2101 Programming Methodology (4) TTG1401 Engineering Mathematics I (4)
SpTerm:	General Education Module 1 (4) General Education Module 2 (4)
Sem 1:	General Education Module 3 (4) TEE2002 Engineering Mathematics II (4) TEE2027 Electronic Circuits (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)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			Sem 1:	General Education Module 5 (4) TEE2028 Microcontroller Programming and Interfacing (4) *TTG3002 Industrial Practice ~~Unrestricted Elective Module (4)~~ TEE3506 Electrical Energy Systems (4)
			3rd Year of studies	
			Sem 2:	TEE2033 Integrated System Lab (4) TEE3031 Innovation & Enterprise I (4) *TTG3002 Industrial Practice (8) Elective Module 1 (4)
			SpTerm:	TTG2415 Ethics in Engineering (4) ~~TEE3506 Electrical Energy Systems (4)~~
			Sem 1:	Elective Module 2 (4) Elective Module 3 (4) Unrestricted Elective Module (4)
			4th Year of studies	
			Sem 2:	*TEE4001 BTech Dissertation Elective Module 4 (4) Elective Module 5 (4)
			SpTerm:	*TEE4001 BTech Dissertation

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Sem 1: *TEE4001 BTech Dissertation (12) Unrestricted Elective Module (4)
18.	12 Sep 2019	SCALE	http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/ School of Continuing and Lifelong Education Home / NUS Bulletin AY2018/19 / School of Continuing and Lifelong Education 1 Faculty's Commitment 2 Key Contact Information 3 Undergraduate Education 3.1 Degrees Offered 3.2 Curriculum Structure and General Academic Matters 3.3 Bachelor of Technology (BTech) Computing 3.3.1 Bachelor of Technology (Business Analytics) 3.3.2 Bachelor of Technology (Cybersecurity) 3.3.3 Bachelor of Technology (Software Engineering) 3.4 Bachelor of Technology (BTech) Engineering 3.4.1 Bachelor of Technology (Chemical Engineering) 3.4.2 Bachelor of Technology (Civil Engineering) 3.4.3 Bachelor of Technology (Electronics Engineering) 3.4.4 Bachelor of Technology (Industrial & Management Engineering) 3.4.5 Bachelor of Technology (Mechanical Engineering) 3.4.6 Bachelor of Technology (Supply Chain Management) 3.5 Financial Assistance 4 Graduate Education *(create a new section and indicate 4.1 Master of Science (Industry 4.0) therein)* 4.1 Master of Science (Industry 4.0) *(create a new section including the details below)*

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			4.1 Master of Science (Industry 4.0) The MSc (Industry 4.0) is an inter-disciplinary programme offered in collaboration with the Faculty of Engineering, Faculty of Science, School of Computing and Institute of Systems Science. The MSc (Industry 4.0) programme will enable student to attain, by the time of graduation: • Breadth in ability to understand technology core concepts from a management viewpoint, including key emerging technology and business areas • Understanding of key business and processes, including supply chain management, systems design and change management • Ability to use both breadth and depth to be more effective functional specialists, or to move up management ranks. • Ability to drive change and transformation projects in a company, through technical understanding, understanding of business processes, and effective leadership Period of Candidature Both full-time and part-time studies are offered. The period of candidature are as follows: • *Full-time studies can be completed in 12-18 months. The maximum candidature is 24 months.* • *Part-time studies can be completed in 18-36 months. The maximum candidature is 48 months.* Degree Requirements Candidates must satisfy the following requirements to be conferred the degree of MSc (Industry 4.0): • *Complete a minimum of 40 MCs with 20 MCs in essential core modules and 20 MCs in graduate certificates and elective modules;* • *Complete at least one Graduate Certificate listed under "List of Modules" below;* • *Attain a minimum CAP of 3.00; and* • *Satisfy any other additional requirements that may be prescribed by the Programme Management Committee for MSc (Industry 4.0), or the University.*

List of Modules

Modules are generally 4 MCs, except when otherwise stated.

I. Essential Core Modules (20MCs)

- *IND5001 Introduction to Industry 4.0 and Applications*
- *IND5002 Digital Physical Integration in Industry 4.0*
- *IND5003 Data Analytics for Sense-making*
- *IND5004 Digital Infrastructure and Transformation*
- *IND5005 Industry Consulting and Application Project*

II. Graduate Certificates & Elective Modules:

All required electives must be completed for the award of the graduate certificate that will be issued by the respective faculties. In addition to the graduate certificate, candidates may select any elective offered to meet the 40-MC graduation requirement.

Faculty	Module Title	MCs
FoE	**Additive Manufacturing (Choose 6 modules)**	**12**
	ME5608A Principles and Processes of Additive Manufacturing	2
	ME5608B Hybrid Manufacturing	2
	ME5615A Design and Pre-processing for Additive Manufacturing	2
	ME5615B Post-processing for Additive Manufacturing	2
	ME5614A Special Project in Additive Manufacturing	2
	ME5513A Fatigue Analysis for Additive Manufacturing	2

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
				MLE5301 Metallic & Ceramic Materials in Additive Manufacturing MLE5302 Polymer Materials in Additive Manufacturing	2 2
				Internet of Things (Choose 5 modules)	**10**
				EE5020 Data Science for Internet of Things EE5021 Cloud Based Services for Internet of Things EE5022 Cyber Security for Internet of Things EE5023 Wireless Networks EE5024 Sensor Networks EE5060 Sensors and Instrumentation for Automation EE5061 Industrial Control and IEC Programming EE5027 Statistical Pattern Recognition EE5026 Machine Learning for Data Analytics EE5025 Intellectual Property: Innovations in IoT	2 2 2 2 2 2 2 2 2 2
			FoS	**Data Mining and Interpretation**	**8**
				ST5227 Applied Data Mining DSA5203 Visual Data Processing and Interpretation	4 4
				Deep Learning for Industry	**8**

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
				DSA5102 Foundations of Machine Learning DSA5204 Deep Learning and Applications	4 4
				Quality Assurance and Yield Optimization	**8**
				ST5203 Design of Experiments for Product Design and Process Improvements ST5208 Analytics for Quality Control and Productivity Improvements	4 4
			SCALE	**Digital Supply Chain**	**12**
				IND5021 Managing the Digital Supply Chain IND5022 Data Analytics for Smart Manufacturing DSC5221A Managing the Financial Supply Chain IND5024 Strategic Procurement in a Digital World	4 4 2 2
			SoC	**Principles and Practice of Secure Systems (Choose 3 modules)**	**12**
				CS5322 Database Security CS5332 Biometric Authentication CS5331 Web Security CS5321 Network Security CS5439 Software Security	4 4 4 4

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

	Digital Business (Choose 3 modules)	**12**
	IS5007 Strategising for Global IT-enabled Business Success IS5116 Digital Entrepreneurship IS5117 Digital Government IS5151 Information System Security Policy and Management	4 4 4 4

Study Schedule
One intake is admitted every year to start in Semester 1 (i.e. August) of the academic year. The recommended study schedule for full-time and part-time studies are illustrated as below.

Full-time Study Schedule	
1st Year of studies, Sem 1:	Core Modules (12 MCs) Preallocated three 4-MC modules Elective Modules (8 MCs) Select from 2-MC and 4-MC modules
1st Year of studies, Sem 2:	Core Modules (8 MCs) Preallocated core and capstone modules

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

	Elective Modules (12 MCs) Select from 2-MC and 4-MC modules
Part-time Study Schedule	
1st Year of studies, Sem 1:	Core Modules (12 MCs) Preallocated three 4-MC modules
1st Year of studies, Sem 2:	Core Modules (4 MCs) Preallocated module Elective Modules (8 MCs) Select from 2-MC and 4-MC modules
2nd Year of studies, Sem 1:	Core Modules (4 MCs) Preallocated capstone module Elective Modules (4 MCs) Select from 2-MC and 4-MC modules
2nd Year of studies, Sem 2:	Elective Modules (8 MCs) Select from 2-MC and 4-MC modules

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			--- http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/ School of Continuing and Lifelong Education Home / NUS Bulletin AY2018/19 / School of Continuing and Lifelong Education 1 Faculty's Commitment 2 Key Contact Information 3 Undergraduate Education 3.1 Degrees Offered 3.2 Curriculum Structure and General Academic Matters 3.3 Bachelor of Technology (BTech) Computing 3.3.1 Bachelor of Technology (Business Analytics) 3.3.2 Bachelor of Technology (Cybersecurity) 3.3.3 Bachelor of Technology (Software Engineering) 3.4 Bachelor of Technology (BTech) Engineering 3.4.1 Bachelor of Technology (Chemical Engineering) 3.4.2 Bachelor of Technology (Civil Engineering) 3.4.3 Bachelor of Technology (Electronics Engineering) 3.4.4 Bachelor of Technology (Industrial & Management Engineering) 3.4.5 Bachelor of Technology (Mechanical Engineering) 3.4.6 Bachelor of Technology (Supply Chain Management) 3.5 Financial Assistance 4 Graduate Education *(create a new section and indicate 4.1 Master of Science (Industry 4.0) therein)*

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			4.1 Master of Science (Industry 4.0) *(create a new section including the details below)* **4.1 Master of Science (Industry 4.0)** The MSc (Industry 4.0) is an inter-disciplinary programme offered in collaboration with the Faculty of Engineering, Faculty of Science, School of Computing and Institute of Systems Science. The MSc (Industry 4.0) programme will enable student to attain, by the time of graduation: • Breadth in ability to understand technology core concepts from a management viewpoint, including key emerging technology and business areas • Understanding of key business and processes, including supply chain management, systems design and change management • Ability to use both breadth and depth to be more effective functional specialists, or to move up management ranks. • Ability to drive change and transformation projects in a company, through technical understanding, understanding of business processes, and effective leadership Period of Candidature Both full-time and part-time studies are offered. The period of candidature are as follows: • *Full-time studies can be completed in 12-18 months. The maximum candidature is 24 months.* • *Part-time studies can be completed in 18-36 months. The maximum candidature is 48 months.* Degree Requirements Candidates must satisfy the following requirements to be conferred the degree of MSc (Industry 4.0): • *Complete a minimum of 40 MCs with 20 MCs in essential core modules and 20 MCs in graduate certificates and elective modules;* • *Complete at least one Graduate Certificate listed under "List of Modules" below;* • *Attain a minimum CAP of 3.00; and* • *Satisfy any other additional requirements that may be prescribed by the Programme Management Committee for MSc (Industry 4.0), or the University.*

List of Modules

Modules are generally 4 MCs, except when otherwise stated.

III. Essential Core Modules (20MCs)

- *IND5001 Introduction to Industry 4.0 and Applications*
- *IND5002 Digital Physical Integration in Industry 4.0*
- *IND5003 Data Analytics for Sense-making*
- *IND5004 Digital Infrastructure and Transformation*
- *IND5005 Industry Consulting and Application Project*

IV. Graduate Certificates & Elective Modules:

All required electives must be completed for the award of the graduate certificate that will be issued by the respective faculties. In addition to the graduate certificate, candidates may select any elective offered to meet the 40-MC graduation requirement.

Faculty	Module Title	MCs
	Additive Manufacturing (Choose 6 modules)	**12**
FoE	ME5608A Principles and Processes of Additive Manufacturing ME5608B Hybrid Manufacturing ME5615A Design and Pre-processing for Additive Manufacturing ME5615B Post-processing for Additive Manufacturing ME5614A Special Project in Additive Manufacturing ME5513A Fatigue Analysis for Additive Manufacturing	2 2 2 2 2 2

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
				MLE5301 Metallic & Ceramic Materials in Additive Manufacturing MLE5302 Polymer Materials in Additive Manufacturing	2 2
				Internet of Things (Choose 8 modules)	**16**
				EE5020 Data Science for Internet of Things EE5021 Cloud Based Services for Internet of Things EE5022 Cyber Security for Internet of Things EE5023 Wireless Networks EE5024 Sensor Networks EE5060 Sensors and Instrumentation for Automation EE5061 Industrial Control and IEC Programming EE5027 Statistical Pattern Recognition EE5026 Machine Learning for Data Analytics EE5025 Intellectual Property: Innovations in IoT	2 2 2 2 2 2 2 2 2 2
			FoS	**Data Mining and Interpretation**	**8**
				ST5227 Applied Data Mining DSA5203 Visual Data Processing and Interpretation	4 4
				Deep Learning for Industry	**8**

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
				DSA5102 Foundations of Machine Learning DSA5204 Deep Learning and Applications	4 4
				Quality Assurance and Yield Optimization	**8**
				ST5203 Design of Experiments for Product Design and Process Improvements Analytics for Quality Control and Productivity Improvements ST5208	4 4
			SCALE	**Digital Supply Chain**	**12**
				IND5021 Managing the Digital Supply Chain IND5022 Data Analytics and Smart Manufacturing DSC5221A Managing the Financial Supply Chain IND5024 Strategic Procurement in a Digital World	4 4 2 2
			SoC	**Principles and Practice of Secure Systems (Choose 3 modules)**	**12**
				CS5322 Database Security CS5332 Biometric Authentication CS5331 Web Security CS5439 Software Security	4 4 4 4

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

	Digital Business (Choose 3 modules)	**12**
	IS5007 Strategising for Global IT-enabled Business Success IS5116 Digital Entrepreneurship IS5117 Digital Government IS5151 Information System Security Policy and Management	4 4 4 4

Study Schedule
One intake is admitted every year to start in Semester 1 (i.e. August) of the academic year. The recommended study schedule for full-time and part-time studies are illustrated as below.

Full-time Study Schedulez	
1st Year of studies, Sem 1:	Core Modules (12 MCs) Preallocated three 4-MC modules Elective Modules (8 MCs) Select from 2-MC and 4-MC modules
1st Year of studies, Sem 2:	Core Modules (8 MCs) Preallocated core and capstone modules

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

	Elective Modules (12 MCs) Select from 2-MC and 4-MC modules
Part-time Study Schedule	
1st Year of studies, Sem 1:	Core Modules (12 MCs) Preallocated three 4-MC modules
1st Year of studies, Sem 2:	Core Modules (4 MCs) Preallocated module Elective Modules (8 MCs) Select from 2-MC and 4-MC modules
2nd Year of studies, Sem 1:	Core Modules (4 MCs) Preallocated capstone module Elective Modules (4 MCs) Select from 2-MC and 4-MC modules
2nd Year of studies, Sem 2:	Elective Modules (8 MCs) Select from 2-MC and 4-MC modules

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>19.</td><td>12 Dec 2019</td><td>SCALE</td><td>
Amendments are in Red.

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.

<table>
<tr><td colspan="2">1st Year of studies</td></tr>
<tr><td>Sem 1:</td><td>TTG1401 Engineering Mathematics 1 (4)
TCN1005 MATLAB Programming for Chemical Engineers (4)
GE Requirements 1 (4)</td></tr>
<tr><td>Sem 2:</td><td>TCN1422 Materials for Chemical Engineers (4)
TCN1111 Chemical Engineering Principles (4)
GE Requirements 2 (4)</td></tr>
<tr><td>SpTerm:</td><td>TCN2411 Mathematics for Chemical Engineers 2 (4)
GE Requirements 3 (4)</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			2nd Year of studies
			Sem 1: GE Requirements 4 (4) TCN2121 Chemical Engineering Thermodynamics (4) TCN2122 Fluid Mechanics (4)
			Sem 2: TCN2116 Chemical Kinetics & Reactor Design (4) TCN2125 Heat and Mass Transfer (4) TCN3124 Particle Technology (4)
			SpTerm: TCN3135 Process Safety, Health and Environment (3) GE Requirements 5 (4)
			3rd Year of studies

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Sem 1:	TCN3121 Process Dynamics & Control (4) TCN3132 Separation Processes (5) TCN3421 Process Modeling & Numerical Simulation (4)
Sem 2:	*TCN4119 BTech Dissertation /Technical Elective Module (4) Technical Elective Module 1 (4) Technical Elective Module 2 (4)
SpTerm:	TTG2415 Ethics in Engineering (4) *TCN4119 BTech Dissertation
4th Year of studies	
Sem 1:	*TCN4119 BTech Dissertation (8) /Technical Elective Module (4) TCN4122 Process Synthesis and Simulation (3) *TTG3001 Industrial Practice /Unrestricted Elective Module (4)

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Sem 2:</td><td>*TCN4124 Final Year Design Project
*TTG3001 Industrial Practice (12) /Unrestricted Elective Module (4)
Technical Elective Module 3 (4)</td></tr>
<tr><td>SpTerm::</td><td>*TCN4124 Final Year Design Project (6)
*Unrestricted Elective Module (4)</td></tr>
</table>
</td></tr>
<tr><td>20.</td><td>13 Feb 2020</td><td>SCALE</td><td>http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/financial-assistance/

Screenshot from current bulletin

B. Singapore Digital Scholarship (Undergraduate)

Eligible students who are enrolled in BTech (Business Analytics), BTech (Cybersecurity) and BTech (Software Engineering) programmes may apply. Please visit this link for more information and enquiries: https://www.imda.gov.sg/imtalent/programmes/sgd-undergraduate.

Instruction from SCALE: Changes in red text below

B. SkillsFuture Study Award for Infocomm Technology
Eligible students who are enrolled in BTech (Business Analytics), BTech (Cybersecurity) and BTech (Software Engineering) programmes may apply. Please visit this link for more information and enquiries. ~~: https://www.imda.gov.sg/imtalent/programmes/sgd-undergraduate.~~</td></tr>
<tr><td>21.</td><td>14 Feb 2020</td><td>SCALE</td><td>http://www.nus.edu.sg/nusbulletin/school-of-continuing-and-lifelong-education/undergraduate-education/financial-assistance/</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Screenshot from current bulletin **C. BCA-Industry Built Environment Undergraduate Sponsorship (for part-time degree)** For eligible students who are enrolled in the BTech (Civil Engineering), this programme co-funds the undergraduate sponsorship offered by industry firms to upgrade and retain their high potential local employees, whom the firms wish to groom to take up higher management and professional roles within the built environment sector. For more information and enquiries, please visit this website: https://www.bca.gov.sg/workforce/besp.html. Instruction from SCALE: Changes in red text below **C. BCA-Industry iBuiltSG Undergraduate Sponsorship Programme (Part-Time)** For eligible students who are enrolled in the BTech (Civil Engineering) or BTech (Mechanical Engineering), this programme co-funds the undergraduate sponsorship offered by industry firms to upgrade and retain their high potential local employees, whom the firms wish to groom to take up higher management and professional roles within the built environment sector. For more information and enquiries, please visit this website: https://www.buildingcareers.gov.sg/Programmes-Initiatives/Scholarship-and-Sponsorship-Programmes/Part-Time-Sponsorships
22.	23 Sep 2019	SDE	**Second Major programmes website – Update by SDE (23 Sep2019)** http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html . . . . ➢ Philosophy ➢ Physics ➢ Political Science ➢ Psychology ➢ Real Estate Finance *(please link this to the faculty website at URL: http://www.rst.nus.edu.sg/undergraduate/Major-in-Real-Estate-Finance.html)*

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			➢ Social Work ➢ Sociology ➢ Southeast Asian Studies ➢ South Asian Studies ➢ Statistics ➢ Systems Engineering ➢ Theatre Studies
23.	2 Jul 2019	FoE	**Updates for Bulletin AY2019/20 (as of 2 Jul 2019)** **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):** 17/18 onwards (19/20 in this case) **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-physics/ **Current text:** 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 / PC2020 Electromagnetism for Electrical Engineers • 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 **Revised text:** Any four modules from the following of which at least two modules must be Level-3000 & above:

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• PC2130 Quantum Mechanics I • PC2131 Electricity and Magnetism I ~~/ PC2020 Electromagnetism for Electrical Engineers~~ • 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 **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):** AY15/16 onwards (19/20 for this word doc) **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/special-programmes/undergraduate-professional-internship-programme-upip/ **Current text:** For more information, visit URL: http://science.nus.edu.sg/students/upip **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):** AY12/13 onwards (19/20 for this word doc) Link: http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-financial-mathematics/

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Current text: To be awarded a minor in Financial Mathematics, a student must pass at least 24 MC's from non-overlapping modules of the following type: Pass at least 8 MCs from MA1xxx, except MA1301/MA1301X; and Pass MA2216/ST2131 or ST2334; and Pass MA3269 and (QF3101 or FIN3102 [for BIZ students] or FIN3702 [for BIZ students]) ; and ST3131 The 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; 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

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			QF3101 Investment Instruments: Theory and Computation FIN3101 Corporate Finance FIN3102/FIN3702* Investment Analysis and Portfolio Management ST2334 Probability and Statistics ST3131 Regression Analysis --- **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):** AY13/14 onwards (19/20 for this word doc) Link: http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-mathematics/ **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~~ Note that these ST and MA modules are crosslisted: ST2131 with MA2216, ST3236 with MA3238, and ST4238 with MA4251. **Revised text:**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
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, except those coded MA33XX.
Note that these ST and MA modules are cross-listed:
• ST2131 with MA2216
• ST3236 with MA3238
• ST4238 with MA4251

To re-word the Major-Minor combination of QF Major + ST minor for clarity (no change) in NUS Bulletin (did not come about from any circulars/meetings) from AY19/20

Link: http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/double-major-and-major-minor-combinations/

<u>Current text:</u>
Table 1: Major-Minor Combinations
<table>
<tr><th>MAJOR-MINOR COMBINATIONS</th><th>RESTRICTIONS</th></tr>
<tr><td>Major in Quantitative Finance and Minor in Statistics</td><td><s>Only MA1102R, ST2131/MA2216 and ST3131 can be used to satisfy both major and minor requirements. You must read 1 additional ST module at level 3000 or above, and which is not overlapping with any other modules used to satisfy the major and minor requirements.</s></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 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Please refer to https://www.stat.nus.edu.sg/index.php/current-students/undergraduate-programme/faq for more details.</td></tr>
</table>

<u>Revised text:</u>
Table 1: Major-Minor Combinations
<table>
<tr><th>MAJOR-MINOR COMBINATIONS</th><th>RESTRICTIONS</th></tr>
<tr><td>Major in Quantitative Finance and Minor in Statistics</td><td>While MA1102R, ST2131/MA2216, ST3131 are in both sets of Major and minor requirements, only 8MCs are allowed to be double counted towards both sets of requirements. Thus, you must read 1 additional ST module at level 3000 and above, and which is not overlapping with any other modules used in order to fulfil both the major and minor requirements

Please refer to https://www.stat.nus.edu.sg/index.php/current-students/undergraduate-programme/faq for more details.</td></tr>
</table>
</td></tr>
<tr><td>24.</td><td>6 Sep 2019</td><td>FoE</td><td>http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/graduate-education/coursework-programmes/master-of-science-safety-health-and-environmental-technology/degree-requirements/</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Elective Modules in Industrial Hygiene SH5101 Industrial Toxicology SH5102 Occupational Ergonomics SH5104 Occupational Health SH5105 Noise and Other Physical Hazards SH5106 Radiation SH5107 Industrial Ventilation SH5108 Chemical Hazard Management SH5109 Biostatistics and Epidemiology SH5110 Chemical Hazard Evaluation Elective Modules in Process Safety SH5002 Fundamentals in Industrial Safety SH5201 Hazard Identification and Evaluation Techniques SH5202 Quantified Risk Analysis SH5203 Emergency Planning SH5204 Safety Engineering SH5205 Incident Management SH5206 Human Factors in Process Safety SH5401 Safety, Health, Environment and Quality Management System OR ESE5602 Environmental Management Systems Other Elective Modules SH5003 Fundamentals in Environmental Protection SH5402 Advanced Safety, Health & Environment Management SH5403 Independent Study SH5404 Safety Health and Environmental Project ESE5202 Air Pollution Control Technology ESE5204 Toxic and Hazardous Waste Management ESE5205 Sludge and Solid Waste Management ESE5402 Industrial Wastewater Control ESE5403 Water Reclamation & Reuse ESE5603 Pollution Minimization and Prevention SH5880 Topics in Industrial Hygiene SH5881 Topics in Process Safety SH5882 Topics in Environment Protection

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			MSc (SHE) ~~**without specialisation**~~ A candidate (full-time and part-time) must successfully complete a programme of study consisting of: a) at least 3 modules from (i) Elective Modules in Industrial Hygiene, b) at least 3 modules from (ii) Elective Modules in Process Safety, and c) any remaining modules from part (i) Elective Modules in Industrial Hygiene, (ii) Elective Modules in Process Safety, (iii) Other Elective Modules, and up to 2 other modules subjected to the approval of the Department. **MSc (SHE) with specialisation in Industrial Hygiene** A candidate (full-time and part-time) must successfully complete a programme of study consisting of: a) at least 6 modules from part (i) Elective Modules in Industrial Hygiene, b) at least 2 modules from (ii) Elective Modules in Process Safety, and c) any remaining modules from part (i) Elective Modules in Industrial Hygiene, (ii) Elective Modules in Process Safety, (iii) Other Elective Modules, and up to 2 other modules subjected to the approval of the Department. **MSc (SHE) with specialisation in Process Safety** A candidate (full-time and part-time) must successfully complete a programme of study consisting of: a) at least 6 modules from part (ii) Elective Modules in Process Safety, b) at least 2 modules from (i) Elective Modules in Industrial Hygiene, and c) any remaining modules from part (i) Elective Modules in Industrial Hygiene, (ii) Elective Modules in Process Safety, (iii) Other Elective Modules, and up to 2 other modules subjected to the approval of the Department.
25.	13 Jan 2020	FoE	**NUS Bulletin 2019/20 – Updates submitted by FoE (13 Jan 2020)** Please update **EG1603 via NUS bulletin** (http://www.nus.edu.sg/nusbulletin/faculty-of-engineering/undergraduate-education/enhancement-programmes/technopreneurship-and-incubation-programme/) as follows: To replace **Old version:** EG1603 TIP – Product & Business Plan Competition (2 MCs) The first TIP module is setup as a competition to emulate the competitive nature of industry and intensify the learning. Students will engage in a two-day Technopreneur boot camp at the start of the course and will apply their newly acquired knowledge and skills to real-life problem statements by writing a business plan that includes a real (technical) solution with validated business models. Students will receive advice from mentors as they develop their solution and business models. They are expected to present their final business plan to a panel of judges at the end of the course. By

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td><u>New and correct version:</u>
EG1603 InnoVenture - Leadership & Innovation Challenge (4 MCs)

InnoVenture is an experiential learning module in which students are challenged to design viable solutions for real engineering problems faced by enterprises. The course is set up to emulate the competitive nature of industry and intensify the learning. Students acquire business knowledge required to develop their solution through a series of foundational workshops, and hone innovation and influencing skills through direct interaction with industry as they develop their tech business solution. Throughout the process they will be guided by mentors to refine their ideas, and to strengthen team and leadership skills.</td></tr>
<tr><td>26.</td><td>18 Jun 2019</td><td>LAW</td><td>(A) http://www.nus.edu.sg/nusbulletin/faculty-of-law/key-contact-information/

<table>
<tr><th>TITLE & NAME</th><th>DESIGNATION/RESPONSIBILITY</th><th>EMAIL (XXXX@NUS.EDU.SG)</th></tr>
<tr><td>Prof Simon CHESTERMAN</td><td>Dean and Head</td><td>lawsac</td></tr>
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<tr><td>Assoc Prof Eleanor WONG</td><td>Vice-Dean (Student Affairs)</td><td>lawwonge</td></tr>
<tr><td>Prof Damian CHALMERS</td><td>Vice-Dean (Research)</td><td>lawjep</td></tr>
<tr><td>Ms GOH Mia Yang</td><td>Associate Dean</td><td>lawgohmy</td></tr>
</table>

Academic Advisors
<table>
<tr><th>TITLE & NAME</th><th>DESIGNATION/RESPONSIBILITY</th><th>TELEPHONE</th><th>EMAIL (XXXX@NUS.EDU.SG)</th></tr>
<tr><td>Prof David TAN</td><td>Vice-Dean (Academic Affairs)</td><td>651 66781</td><td>lawdtkh</td></tr>
<tr><td>Assoc Prof Eleanor WONG</td><td>Vice-Dean (Student Affairs)</td><td>651 63587</td><td>lawwonge</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Prof Damian CHALMERS	Vice-Dean (Research)	660 13460	lawjep

(B) http://www.nus.edu.sg/nusbulletin/faculty-of-law/graduate-education/research-programmes/degrees-offered/
Close and regular supervision will be provided by members of the academic staff of the Faculty of Law, whose research interests vary across many fields of law. In particular, the Faculty's research strength lies in the areas of international and commercial law.

The Faculty offers the following research degree:

- Doctor of Philosophy (Ph.D.)

As Asia's Global Law School, the Faculty of Law is committed to fostering excellence in research by building a strong core of doctoral research students.
The NUS PhD comprises: (i) coursework (up to 6 graduate courses, taken in the first year), followed by (ii) a thesis of not more than 80,000 words. Successful applicants will commence their candidature as probationary PhD students and will work under the supervision of a Faculty member at NUS Law. Within 12-18 months of their candidature, probationary PhD students must orally defend an outline of the proposed PhD thesis at the Doctoral Candidate Qualifying Examination. Candidates who succeed at the DCQE will have their PhD candidature confirmed and may proceed to write the thesis.
The Ph.D. is awarded on the submission of a thesis of not more than 80,000 words that is a substantial piece of original research in a particular field of law, or a critical interpretation worthy of publication, written under supervision by a Faculty academic member.
Most PhD candidates complete their thesis within three to four years. The minimum period of candidature is two years, and the maximum five years.
For more information, please visit: *http://www.law.nus.edu.sg/admissions/research_prog.html*

(C) http://www.nus.edu.sg/nusbulletin/faculty-of-law/graduate-education/coursework-programmes/degree-requirements/specialised-master-of-laws-ll-m-by-coursework/

The Faculty offers the following specialisations:

- Master of Laws (Asian Legal Studies)
- Master of Laws (Corporate & Financial Services Law)
- Master of Laws (Intellectual Property & Technology Law)

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• Master of Laws (International Arbitration and Dispute Resolution) • Master of Laws (International & Comparative Law) • Master of Laws (Maritime Law) • Candidates must possess a good LL.B. Honours Degree from a reputable university. A candidate is required to read a total of 40-44 credits of modules, whereby 24 credits of modules must be from the relevant module grouping. Candidates may opt to do a directed research paper in lieu of 4 credits of modules. (D) http://www.nus.edu.sg/nusbulletin/faculty-of-law/graduate-education/coursework-programmes/degree-requirements/master-of-laws-international-business-law/ Since 2005, NUS Law has offered a specialised LL.M. in International Business Law which is taught at NUS in Singapore and the East China University of Political Science and Law (ECUPL) in Shanghai. This programme is taught entirely in English, and is offered partly in Singapore, and partly in Shanghai. It is the first overseas degree programme to be offered by NUS Law. Students who successfully complete the degree requirements will obtain an LL.M. (International Business Law) degree conferred solely by NUS (this is not a joint degree). Candidates must possess a good LL.B. Honours Degree from a reputable University. Candidates will spend the entire first semester in NUS, and spend the second semester in Shanghai at premises set aside for the NUS Faculty of Law within ECUPL's campus. Candidates will read a total of 40-44 credits of modules in the programme. The programme is conducted on a full-time basis over a period of two semesters and is fully by coursework. The minimum period of candidature is one year (two semesters) and the maximum is three years (six semesters). For more information, please visit: *http://law.nus.edu.sg/admissions/coursework/llm_ibl.html* (E) http://www.nus.edu.sg/nusbulletin/faculty-of-law/graduate-education/coursework-programmes/graduate-diploma-in-maritime-law-arbitration/ This programme is designed for master mariners and non-lawyer professionals working in the maritime industry. Candidates in the programme are required to read 32-36 credits of modules. 12 of these credits may be taken from the modules offered in the Faculty's Graduate Certificate in International Arbitration programme, with the remaining 20-24 credits of modules drawn from modules in the Maritime Law grouping. Overseas candidates accepted into the programme will pursue it full-time within two semesters. Candidates working for companies based in Singapore who are supported by the Maritime and Port Authority of Singapore will normally pursue the programme part-time and complete it within four semesters. The programme is fully by coursework. The minimum period of candidature for full-time programme is one year (two semesters) and the maximum is three years (six semesters). The minimum period of candidature for part-time programme is two years (four semesters) and the maximum is three years (six semesters). For more information, please visit: *https://law.nus.edu.sg/admissions/graddip/dip_mlarb.html*

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<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
(F) http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/joint-degree-programmes-concurrent-degree-programmes-double-degree-programmes-with-overseas-universities/nus-master-of-laws-international-arbitration-and-dispute-resolution-geneva-master-of-laws-in-international-dispute-settlement-mids-double-degree-programme/
The NUS Master of Laws (International Arbitration and Dispute Resolution)–Geneva Master of Laws in International Dispute Settlement (MIDS) Double Degree Programme (DDP) is available to students in the NUS LL.M. (International Arbitration & Dispute Resolution) programme. Under this arrangement, students will complete the curriculum for the LL.M. (IADR) at NUS and then go to Geneva to read the LL.M. in International Dispute Settlement (MIDS) for one semester. Upon successful completion of their studies at Geneva, NUS law students will graduate with an LL.M. (IADR) from NUS and LL.M. in International Dispute Settlement (MIDS) from Geneva.

For more information, please visit: http://law.nus.edu.sg/student_matters/grad_prog/nus_geneva_ddp.html

(G) http://www.nus.edu.sg/nusbulletin/faculty-of-law/undergraduate-education/degree-requirements/bachelor-of-laws/

(Order of the modules sorted by Year-Long -> 1 -> 2)

Compulsory Core LL.B. Curriculum
<table>
<tr><th>Year One</th><th>Sem</th><th>Credits</th></tr>
<tr><td>Law of Contract</td><td>Year-Long</td><td>8</td></tr>
<tr><td>Legal Analysis, Research & Communication</td><td>Year-Long</td><td>8</td></tr>
<tr><td>Law of Torts</td><td>1</td><td>8</td></tr>
<tr><td>Singapore Law in Context</td><td>1</td><td>4</td></tr>
<tr><td>Criminal Law</td><td>2</td><td>8</td></tr>
<tr><td>Introduction to Legal Theory</td><td>2</td><td>4</td></tr>
<tr><td>Total</td><td></td><td>40</td></tr>
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<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Year Two</td><td>Sem</td><td>Credits</td></tr>
<tr><td>Company Law</td><td>1</td><td>8</td></tr>
<tr><td>Legal Systems of Asia</td><td>1</td><td>4</td></tr>
<tr><td>Principles of Property Law</td><td>1</td><td>8</td></tr>
<tr><td>Corporate Deals OR Trial Advocacy</td><td>2</td><td>4</td></tr>
<tr><td>Constitutional & Administrative Law</td><td>2</td><td>8</td></tr>
<tr><td>Equity & Trusts</td><td>2</td><td>8</td></tr>
<tr><td>Pro Bono Services</td><td>–</td><td>0</td></tr>
<tr><td>Total</td><td></td><td>40</td></tr>
<tr><td>Year Three</td><td>Sem</td><td>Credits</td></tr>
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2 Key Contact Information
Home / NUS Bulletin AY2019/20 / Faculty of Law / Key Contact Information
<table>
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Ms GOH Mia Yang	Associate Dean	lawgohmy

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Assoc Prof Eleanor WONG	Vice-Dean (Student Affairs)	651 63587	lawwonge
Prof Damian CHALMERS	Vice-Dean (Research)	660 13460	lawdami

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Ms Adeline TAN	Assistant Dean (Graduate Coursework Programmes)	651 61318	lawtmla
Mr KOH Chao Xiong Desmond	Manager (Undergraduate Programme)	6601 1575	deskohcx
Ms Karen NGIAM	Assistant Manager (Graduate Coursework Programmes)	651 64280	lawnlkk
~~Ms Joanne TAN~~	~~Assistant Manager ((Undergraduate Programmes)~~	~~660 11575~~	~~lawjtbl~~
Ms Kuldeep KAUR	Management Assistant Officer	651 65507	lawkkaur
Ms Ophelia LOH	Management Assistant Officer	651 63604	lawlohpc

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Ms SHAMSIAH Dasuki</td><td>Management Assistant Officer</td><td>651 63604</td><td>lawsd</td></tr>
<tr><td>Ms NORMAH Mahmood</td><td>Management Assistant Officer</td><td>651 63630</td><td>lawnm</td></tr>
<tr><td>Ms ZANARIAH Zainol</td><td>Management Assistant Officer</td><td>651 63630</td><td>lawzzam</td></tr>
<tr><td>Ms ROHANAH Mohamad</td><td>Management Assistant Officer</td><td>651 64142</td><td>lawrm</td></tr>
</table>
</td></tr>
<tr><td>28</td><td>23 Jan 2020</td><td>NUSMed</td><td>
<u>Changes to NUS Bulletin AY2019-2020 from NUS Medicine</u>

Home / NUS Bulletin AY2019/20 / Yong Loo Lin School of Medicine / Key Contact Information:

http://www.nus.edu.sg/nusbulletin/yong-loo-lin-school-of-medicine/key-contact-information/

<table>
<tr><th>Title & Name</th><th>Designation/Responsibility</th><th>Telephone</th><th>Email (XXXX@nus.edu.sg)</th></tr>
<tr><td>Assoc Prof TI Lian Kah</td><td>Head, Department of Anaesthesia</td><td>6772 4200</td><td>anahead</td></tr>
<tr><td>Assoc Prof Shaikali Thameem DHEEN</td><td>Head, Department of Anatomy</td><td>6516 3127</td><td>anthead</td></tr>
<tr><td>Prof Markus R WENK</td><td>Head, Department of Biochemistry</td><td>6516 3624</td><td>bchhead</td></tr>
<tr><td>Assoc Prof QUEK Swee Tian</td><td>Head, Department of Diagnostic Radiology</td><td>6772 4211</td><td>dnrhead</td></tr>
<tr><td>Assoc Prof DAN Yock Young</td><td>Head, Department of Medicine</td><td>6772 4362</td><td>mdchead</td></tr>
</table>
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<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Prof Nicholas Robert John GASCOIGNE</td><td>Head, Department of Microbiology and Immunology</td><td>6516 3275</td><td>michead</td></tr>
<tr><td>Prof Emily ANG Neo Kim</td><td>Head, Alice Lee Centre for Nursing Studies</td><td>6516 5088</td><td>nurhead</td></tr>
<tr><td><s>Prof YONG Eu Leong</s> Assoc Prof CHOOLANI Mahesh Arjandas</td><td>Head, Department of Obstetrics and Gynaecology</td><td>6772 4285</td><td>obghead</td></tr>
<tr><td>Assoc Prof Clement TAN Woon Teck</td><td>Head, Department of Ophthalmology</td><td>6772 5338</td><td>ophhead</td></tr>
<tr><td><s>Prof Kandiah SATKUNANANTHAM</s> Prof HUI Hoi Po, James</td><td><s>Acting</s> Head, Department of Orthopaedic Surgery</td><td><s>6772 4326</s> 6772 4331</td><td>doshead</td></tr>
<tr><td>Assoc Prof LOH Woei Shyang</td><td>Head, Department of Otolaryngology</td><td>6772 5372</td><td>enthead</td></tr>
<tr><td>Prof LEE Yung Seng</td><td>Head, Department of Paediatrics</td><td>6772 4112</td><td>paehead</td></tr>
<tr><td>Assoc Prof TAN Soo Yong</td><td>Head, Department of Pathology</td><td>6772 4300</td><td>pathead</td></tr>
<tr><td>Assoc Prof Fred WONG Wai-Shiu</td><td>Head, Department of Pharmacology</td><td>6516 3266</td><td>phchead</td></tr>
<tr><td><s>Assoc Prof LIM Kah Leong</s> Assoc Prof Reshma Taneja</td><td>Acting Head, Department of Physiology</td><td>6516 3222</td><td>phshead</td></tr>
<tr><td>Assoc Prof WONG Chee Meng John</td><td>Head, Department of Psychological Medicine</td><td>6772 4511</td><td>pcmhead</td></tr>
<tr><td>Prof Krishnakumar MADHAVAN</td><td>Head, Department of Surgery</td><td>6772 4220</td><td>surhead</td></tr>
<tr><td>Assoc Prof CHEN Fun Gee, Edward</td><td>Director, Division of Graduate Medical Studies</td><td>6601 4949</td><td>gsmhead</td></tr>
</table>
</td></tr>
<tr><td>29.</td><td>13 Jun 2019</td><td>NGS</td><td>Special Programmes – Update by NGS (13 Jun 2019)

• Graduate Concurrent Degree Programmes
http://www.nus.edu.sg/registrar/education-at-nus/graduate-education/special-graduate-programmes/concurrent-degree-programmes.html</td></tr>
</table>

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<tr><td></td><td></td><td></td><td>PhD (in Science, Engineering, or Life Sciences) and MBA (please link to https://www.nusnni.nus.edu.sg/nus-phd-mba/</td></tr>
<tr><td>30.</td><td>19 Sep 2019</td><td>YSTCM</td><td><u>NUS Bulletin 2019/20 – YSTCM – Updates (19 Sep 2019)</u>

Please update as indicated in red below and also see comments in purple.

1. NUS Bulletin 2019/20 – Yong Siew Toh Conservatory of Music, 3.2.2.1 Graduation Requirements for Students http://www.nus.edu.sg/nusbulletin/yong-siew-toh-conservatory-of-music/undergraduate-education/degree-requirements/curriculum-structure-and-requirements/graduation-requirements-for-students/

Curriculum Outline for <s>Recording Arts and Science</s> Audio Arts and Sciences Majors matriculated in AY 2018/2019 and beyond

<table>
<tr><th colspan="2">Major Requirements (72 MC)</th></tr>
<tr><td>Fundamentals of Music Production and Recording 1 and 2</td><td>8 MC</td></tr>
<tr><td>Critical Listening 1 and 2</td><td>8 MC</td></tr>
<tr><td>Live Sound Reinforcement</td><td>4 MC</td></tr>
<tr><td>Live Sound Reinforcement Project</td><td>4 MC</td></tr>
<tr><td>Final Project</td><td>8 MC</td></tr>
<tr><td>Multitrack Recording 1 and 2</td><td>8 MC</td></tr>
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</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)	
			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
			Faculty Requirements (36 MC)	
			Introduction to Musical Concepts & Materials	4 MC
			Compositional Engagement Modules *(3 modules, 1 per semester in semesters 2-4)*	12 MC
			Foundations for Musical Discovery	4 MC
			Contextual Engagement Module	4 MC
			Introduction to Professional Integration	4 MC
			Leading and Guiding Through Music	4 MC

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Musical Pathways	4 MC
University Requirements (20 MC)	
General Education Modules *(5 modules from GER, GEQ, GEH, GET, GES)*	
Unrestricted Electives (32 MC)	
Conservatory Requirements (no MC)	
Noon Recitals *(6 semesters of satisfactory attendance)* Ensemble Activities *(as required by the Ensembles & Professional Development Office*	

Curriculum Breakdown for ~~Recording Arts and Science~~ Audio Arts and Sciences Majors

2. NUS Bulletin 2019/20 – Yong Siew Toh Conservatory of Music – 3.2.2 Curriculum Structure and Requirements
http://www.nus.edu.sg/nusbulletin/yong-siew-toh-conservatory-of-music/undergraduate-education/degree-requirements/curriculum-structure-and-requirements/

3.2.2.1 Graduation Requirements for YST Students
3.2.2.2 Departmental Requirements
3.2.2.3 ~~Bachelor of Music (Audio Arts & Sciences Major)~~Second Major in Audio Arts and Sciences

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			(retain the same link but to change the title of the url accordingly) 3.2.2.4 Joint Degree Programme --- 3. NUS Bulletin 2019/20 – Yong Siew Toh Conservatory of Music – Second Major in Audio Arts and Sciences http://www.nus.edu.sg/nusbulletin/yong-siew-toh-conservatory-of-music/undergraduate-education/degree-requirements/curriculum-structure-and-requirements/bachelor-of-music-recording-arts-and-sciences-major/ 3.2.2.3 Second Major in Audio Arts and Sciences Home / NUS Bulletin AY2019/20 / Yong Siew Toh Conservatory of Music / Undergraduate Education / Degree Requirements / Curriculum Structure and Requirements / Second Major in Audio Arts and Sciences In line with the University's initiative to introduce Double Major Programmes in NUS, the Yong Siew Toh Conservatory of Music (YSTCM) offers a Second Major in Audio Arts and Sciences by combining courses in recording arts with the sciences and engineering. In conjunction with their primary major, this second major programme aims to equip students from various schools/faculties with a strong foundation as well as knowledge in key advanced topics in the burgeoning area of audio arts and sciences, and thus better prepare them for career opportunities in engineering and related fields focused on development of audio and music technologies. Structure of the Second Major a. In line with University guidelines, the second major will require students to complete 48 MCs (12 modules) within the following structure: 1. Completion of the following five compulsory modules: Foundational Core Modules: MUA1170 Fundamentals of Music Production and Recording 1 MUA1171 Fundamentals of Music Production and Recording 2 MUA2170 Multitrack Recording 1

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			MUA2173 Room Acoustics MUA1172 Critical Listening 1 *(leave a line spacing here)* 2. Completion of the following two Audio Programme Post-Production modules: MUA3170 Audio Postproduction 1 MUA4170 Audio Postproduction 2 *(leave a line spacing here)* 3. Completion of the following five new modules which are project-based: MUA2175 AAS Project 1 MUA2176 AAS Project 2 MUA3175 AAS Project 3 MUA4175 AAS Project 4 MUA4176 AAS Final Project (leave a line spacing here) 4. At most two modules of the Second Major may be double-counted with other programmes. ~~b. Students applying for this major must have read H2 Maths and H2 Physics.~~ b. The plan is to continue to accept a small intake size of 2-4 students for each cohort year. c. Entry into the programme would be based on: • application by students to YST at the end of their first year of study. • ~~completion of the modules in (b)~~ • a live audition to be conducted whenever deemed necessary d. Students are advised begin this Second Major in Year 2 Semester 1, as it is planned for completion over six semesters with a strict semestral schedule for module offerings.
31.	6 Mar 2020	YSTCM	**Double Major Programmes website – Updates submitted by YSTCM (6 Mar 2020)** Registrar's Office website > Academic Information/Policies > Undergraduate Education > Special Programmes > Double Major Programmes http://www.nus.edu.sg/registrar/academic-information-policies/undergraduate-students/special-programmes/double-major-programmes • **Music-related** *(hyperlink to: https://www.ystmusic.nus.edu.sg/programmes-access-for-nus-students/)*

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			○ Audio Arts and Sciences *(hyperlink to: https://www.ystmusic.nus.edu.sg/programmes-second-major-aas/)* ○ Composition ~~○ Music and Society~~ ~~○ Music, Collaboration and Production~~ ○ Voice ~~○ *Instruments*~~ *Instrumental Performance:* ▪ Bassoon ▪ Cello ▪ Clarinet ▪ Double Bass ▪ Flute ▪ Harp ▪ Horn ▪ Oboe ▪ Percussion ▪ Piano ▪ Trumpet ▪ Trombone ▪ Tuba ▪ Violin

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>▪ Viola</td></tr>
<tr><td>32..</td><td>12 Dec 2019</td><td>SSHSPH</td><td>http://www.nus.edu.sg/nusbulletin/saw-swee-hock-school-of-public-health/graduate-education/coursework-programmes/degree-requirements/mph/

<table><tr><th>GENERAL</th><th>SPECIALISATION</th></tr><tr><td>[Default]</td><td>[Optional]</td></tr><tr><td></td><td>• Epidemiology and Quantitative Methods
• Global Health
• Health Policy and Services
• Health Promotion
• Occupational Health</td></tr></table>
All to link to New URL:
https://sph.nus.edu.sg/education/mph/curriculum/</td></tr>
<tr><td>33</td><td>19 Jun 2019</td><td>FoS</td><td>UG Special Programmes

Changes to be made on respective websites – FoS (as of 19 Jun 2019)

• Double/Concurrent/Joint Degree Programmes with Overseas Universities
http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-concurrent-joint-degree-programmes-with-overseas-universities.html

2. JDP with University of North Carolina at Chapel Hill (correct link should be http://www.lifesciences.nus.edu.sg/info/lsm_jdpuncch.pdf)
3. JDP with Dundee (link wrong: correct link should be http://www.lifesciences.nus.edu.sg/info/lsm_jdpuodundee.pdf)

• Double Major Programmes</td></tr>
</table>

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			http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/double-major-programmes.html - Mathematics **(correct link should be: http://ww1.math.nus.edu.sg/undergraduates.aspx?f=UP-MA2)** - Physics **(correct link should be https://www.physics.nus.edu.sg/student/ugrad_course-structure.html)** • **FAQs on DDP, CDP and DM** ➢ http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/faqs-for-ddp-cdp-and-dm.html#CDP To remove programmes in **red** and add the one in **green**: • Bachelor of Science (Computational Biology) Honours from NUS and Scientiae Magister in Computer Science (Computational Biology) from Brown University • Bachelor of Science (Honours) in Life Sciences from NUS and Master of Research (M.Res.) in Molecular Biophysics from Department of Biomedical Sciences, King's College London (KCL) • Concurrent Programme in Bachelor of Science in Life Sciences of National University of Singapore and Doctor of Veterinary Medicine of University of Melbourne • **Minor Programmes** http://www.nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes/minor-programmes.html - Biophysics (offering dept is stated as "Department of Physics and Life Sciences Programme" but "Life Sciences Programme" should be replaced with "Department of Biological Sciences" instead)
34.	15 Jul 2019	FoS	Change #1 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/key-contact-information/ 2 Key Contact Information *Deanery* ~~Assoc Prof CHAN Yin Thai Assistant Dean, Research and Graduate Studies 8780 scichany~~ Replace with Assoc Prof ZHAO Yu Assistant Dean, Research and Graduate Studies 8780 scizyu

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Heads of Departments / Directors of Programmes
(to add one row in between the two)

Prof CHAN Hock Peng	Head, Statistics and Applied Probability	2945	stahead
Assoc Prof LIOU Yih-Cherng	Director, Science Communication Programme	7711	dbslyc
Assoc Prof TAN Hwee Huat	Director, Quantitative Finance Programme	6144	mattanhh

Graduate Programmes

Prof Eric CHAN Chun Yong	EXCO member, Pharmacy	6137	phaccye
Assoc Prof Ramanathan MAHENDIRAN	EXCO member, Physics	2616	phyrm
Assoc Prof LI Jialiang	EXCO member, Statistics and Applied Probability	8932	stalj

Administrative Coordinators

Ms Carrie WONG Suk Tak	Manager, Chemistry [Undergraduate Programmes, Graduate Programmes (Coursework)]	6361	chmwst
Ms June CHAN	Manager, Chemistry ~~[Graduate Programmes (Coursework – TUM)~~]	8102	chmcsc

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			Ms Suriawati Binte SAAD — Executive, Chemistry (Graduate Programmes) — 2660 — chmss Change #2 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/ 4.2.2.7 Master of Science in Pharmaceutical Sciences and Technology (Part-Time) Change #3 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/masters-of-science-in-science-communication/ 4.2.2.12 Joint Master of Science in Science Communication (NUS-ANU)(Full-Time or Part-Time) The MSc in Science Communication is a joint MSc degree offered by NUS and the Centre for the Public Awareness of Science (CPAS) ~~College of Science~~, Australian National University (ANU). The programme aims to foster the skills necessary to: •be competent, confident communicators of science and technology to the general public and school-age audiences; •develop materials for effective communication to non-specialist audiences; •propose and supervise project work and other scientific activities; and •develop confidence in lifelong learning. Admission Requirements Applicants have to fulfil the admission requirements for both universities in order to gain admission to the joint degree programme. Applicants seeking admission must have: •a Bachelor degree in Science with Honours (or equivalent) from a reputable university •Applicants whose native tongue or medium of instruction is not completely in English should submit TOEFL/IELTS scores as evidence of their proficiency in the English Language. •The minimum requirement for TOEFL score is: •Paper-Based Test: 580 •Computer-Based Test: 260 •Internet-Based Test: 85 with at least 22 for the Writing component, 18 for the Speaking component and 18 for the Listening component. •The minimum requirement for IELTS score is 6.5 with at least 6 for each component. • Applicants should also ensure they meet the ANU English Language requirements before they submit their application. •Applicants without an honours degree in science will be considered on a case-by-case basis.

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			Programme Structure The course can be taken full-time over one year or part-time over two years with a maximum candidature of three years for full-time and four years for part-time. Full-time students will spend one semester at NUS and one semester at ANU. Part-time students will complete the entire programme at NUS. The ANU modules will be conducted in intensive mode at the ANU Campus or via E-Learning mode. All students can work on their dissertation (project) concurrently with their modules or during the subsequent year. Students have to fulfill the following conditions: a. Read and pass the following 2 essential modules (9 MCs) •NUS Module: MW5201 Topics in Science Communication (4 MCs) •ANU Module: SCOM8014 (MW5152) Communicating Science with the Public (5 MCs) b. Read and pass 1 elective module from List A (4 MCs) and 3 elective modules from List B (15 MCs) List A •NUS Module: MW5202 Innovations in Science Teaching (4 MCs) •NUS Module: MW5203 Frontier Topics in Science (4 MCs) List B •ANU Module: SCOM6015 (MW5255) Speaking of Science (5 MCs) •ANU Module: SCOM6003 (MW5258) Science in Popular Fiction (5 MCs) •ANU Module: SCOM6012 (MW5271) Science Communication and the Web (5 MCs) •ANU Module: SCOM6016 (MW5256) Science in the Media (5 MCs) •ANU Module: SCOM6017 (MW5254) Public Events for Science Engagement (5 MCs) •ANU Module: SCOM6029 (MW5259) Cross Cultural Perspectives in Science Communication (5 MCs) •ANU Module: SCOM6030 (MW5272) Science Dialogue Theory and Practice (5 MCs) •ANU Module: SCOM6032 (MW5273) Making Modern Science (5 MCs) •ANU Module: SCOM6501 (MW5270) Strategies in Science Communication (5 MCs) •ANU Module: SCOM6027 (MW5257) Science and Politics ~~Public Policy~~ (5 MCs) •ANU Module: SCOM6031 (MW5151) Science, Risk and Ethics (5 MCs) •ANU Module: SCOM8020 (MW5150) Science Communication in Schools and Public (5 MCs) •ANU Module: POPH8115 (MW5264) Health Promotion and Protection (5 MCs)

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			c. Complete a research project (MW5200) amounting to 12 MCs d. Obtain a minimum Cumulative Average Point (CAP) of 3.00 Change #4 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/master-of-science-in-quantitative-finance-part-time-or-full-time/ 4.2.2.9 Master of Science in Quantitative Finance (Full-Time and Part-Time) Programme Structure Students have to fulfil all the following conditions: 1. Read and pass the following ~~six~~ five essential modules: • MA4269 Mathematical Finance II • QF4102 Financial Modelling • QF5210 Financial Time Series: Theory and Computation • QF5202 Structured Products • QF5203 Risk Management 2. Read and pass ~~four~~ five elective modules chosen from the following list: • DSA5205 Data Science in Quantitative Finance • MA5233 Computational Mathematics • MA5248 Stochastic Analysis in Mathematical Finance • QF5201 Interest Rate Theory and Credit Risk • QF5204 Numerical Methods in Quantitative Finance • QF5205 Topics in Quantitative Finance I • QF5206 Topics in Quantitative Finance II • QF5207 Investment and Portfolio Selection • QF5208 AI & FinTech • EC5102 Macroeconomic Theory • EC5103 Econometric Modelling & Applications I • EC5332R Money and Banking • ~~ECA5315 Financial Econometrics~~ • ECA5334 Corporate Finance • ST5207 Non-parametric regression • ST5210 Multivariate Data Analysis • ST5218 Advanced Statistical Methods in Finance Change #5

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			Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/joint-masters-of-science-in-industrial-chemistry-nus-tum/ 4.2.2.11 Joint Master of Science in Industrial Chemistry (NUS-TUM)(Full-Time) **Objective** ~~This programme aims to groom future leaders in selected areas of technology. Specifically, the Masters of Science in Industrial Chemistry will be an enabling postgraduate course for specialist engineers for the pharmaceutical, as well as the fine and speciality chemical industries. The degree will be jointly awarded by Technische Universität München (TUM) and the National University of Singapore (NUS).~~ This programme aims to equip students with the knowledge to prepare them for careers in both research and in the industry, which will help to pave their way towards being leaders in the fields of pure- and applied-chemistry. **Admission Requirements** ~~1.An applicant must have completed at least a 3-year Bachelor Degree (Honors) or European/German FH Diploma or its equivalent in areas of Chemical Engineering / Chemistry or closely related discipline from a university with recognized standing with at least a 2nd Upper Honors or equivalent.~~ 1. In order to be eligible for the programme, the applicant must have at least a Bachelor Degree (completed in at least three years, depending on factors such as the rest of the applicant's education background) in Chemical Engineering or Chemistry or in a closely related discipline with remarkable results. ~~2.The applicant must be able to demonstrate a satisfactory level of the language. Applicant whose native tongue or medium of instruction from previous studies (Bachelor / FH Diploma) is not English must submit the TOEFL result with a minimum of 605 for Paper-based test, or 88 for Internet-based test, or 234 for Computer-based test OR IELTS result of at least 6.5 OR CAE grade A, B, or C.~~ 2. The applicant must be able to demonstrate a satisfactory level of the language. Applicant whose native tongue or medium of instruction from previous studies (Bachelor) is not English must submit the TOEFL result with a minimum of 88 for Internet-based test OR IELTS result of at least 6.5. 3.Additionally, an Akademische Prüfstelle (APS) certificate is required for applicants with education qualifications from China, Vietnam or Mongolia. The APS certificate is compulsory if your Bachelor studies was completed in a Chinese, Vietnamese or Mongolian university, regardless of nationality. **Curriculum and Course Structure** ~~The Master of Science in Industrial Chemistry degree is a 20 month full-time programme. Students must complete 11 months of coursework with 3 months of internship placement and 6 months of Master Thesis / Dissertation.~~ ~~In 11 months of coursework, candidates must successfully complete 2 pre-essential compulsory modules, 4 core modules, 6 elective modules, and 3 cross-discipline modules.~~ The Master of Science in Industrial Chemistry degree is a 2-year full-time programme. Students must complete the coursework, an internship module and the Master Thesis / Dissertation during the course of study. ~~Continuation and Termination of Candidature~~

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			~~In order for a student to graduate on time, the student must obtain a minimum overall CAP score of 2.50. TUM-Asia will issue an academic warning to students if their CAP scores fall below 2.50. There is also a risk of candidature termination for failure in any modules if overall CAP score falls below 2.50.~~ **Programme Intake** There is one intake per academic year in August. **More Information** For more details of the programme, please refer to: http://tum-asia.edu.sg/admissions/graduate/msc-industrial-chemistry/ Change #6 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/master-of-science-in-statistics-part-time-or-full-time/ **Admission Requirements** Candidates may be admitted to one of two study tracks which are catered to candidates with different levels of qualification. For admission to Track 1 (40 MCs), a candidate must have •A local honours degree in related fields, or equivalent •An equivalent overseas degree (a four-year Bachelor's degree) •Good performance in Math modules For admission to Track 2 (80 MCs), a candidate must have •At least a three-year Bachelor's degree in related fields or equivalent, with a satisfactory GPA. •Good performance in Math modules In addition, a candidate whose native tongue or medium of undergraduate instruction is not English must have a TOEFL score of at least 580 for Paper-based test, 260 for Computer-based test or 85 for Internet-based test (with at least 22 for the writing component) or an IELTS score of at least 6. Change #7 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/master-of-science-in-pharmaceutical-sciences-and-technology/ ~~The Master of Science in Pharmaceutical Sciences and Technology is designed to cater to special interest groups of prospective students who are already working or aspiring to enter the pharmaceutical industry. This may be in areas~~

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			~~of manufacturing and quality assurance of active pharmaceutical ingredients (API) and/or finished pharmaceutical products, regulatory affairs, medication utilisation review and drug registration.~~ ~~According to the feedback from the pharmaceutical industry, there is a lack of knowledge and skills in the area of formulation science, pharmaceutical process validation and pharmaceutical product quality assurance among the current workforce in Singapore, compared to those of India, Ireland, USA and UK. However, it remains necessary for the pharmaceutical industry to continue hiring people equipped with relevant core competencies, for example chemical engineering, organic synthetic chemistry, chemical analysis, biotechnology, biomedical sciences etc.~~ ~~Therefore, it will be useful for these people to have gained on-the-job skills and sufficient work experience to enable them to appreciate how their core competency is related to the general operations in pharmaceutical manufacturing and development of drug products.~~ ~~This programme aims to address the gap in manpower training by introducing topics in pharmaceutical sciences and pharmaceutical technology that focus on the processing and manufacturing of the active pure drugs right through to the formulation and quality assurance of the final product.~~ ~~**Learning Outcomes**~~ ~~Graduates from this programme will enhance their on-the-job competency by:~~ ~~•Gaining in-depth knowledge and practical skills for formulation and process manufacturing of chemical and biological drugs into a range of pharmaceutical dosage forms, ranging from tablets to injectables.~~ ~~•Acquiring understanding of the regulatory and quality compliance of pharmaceuticals in the process of drug development and manufacturing.~~ ~~**Admission Requirements**~~ ~~To be admitted into the programme (part-time option only), candidates must be holders of one of the following degrees, or their equivalent:~~ ~~•Bachelor of Science (Honours) in Chemistry~~ ~~•Bachelor of Science (Honours) in Life Sciences~~ ~~•Bachelor of Applied Science (Honours) in Food Science & Technology~~ ~~•Bachelor of Applied Science (Honours) in Applied Chemistry (Drug Option)~~ ~~•Bachelor of Science in Pharmacy (Honours)~~ ~~•Bachelor of Engineering (Chemical Engineering) (Honours).~~ ~~Candidates without a Bachelor degree in Pharmacy will have to read and pass PR3301 Pharmaceutical Dosage Forms as a bridging module.~~ ~~**Special Criteria for Admission**~~ ~~•Candidates who do not have Honours classification in the degree prerequisites as stipulated above may apply for admission with GRE results.~~ ~~•Candidates who hold equivalent degrees from overseas universities may apply for admission with GRE and TOEFL results.~~

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			~~**Programme Structure**~~ ~~Candidates admitted into the Master degree program must read and pass a total of 10 modules (40 MC), comprising 3 essential modules and 7 elective modules:~~ ~~Three Essential Modules, 4 MCs each:~~ ~~1. PR5211 Pharmaceutical Analysis IV~~ ~~2. PR5217 Formulation Science~~ ~~3. PR5218 Practical in Product Development – Lab Rotation~~ ~~Seven Elective Modules, 4 MCs each – choose from the following:~~ ~~Group A Cluster: Process & Technology~~ ~~1. PR5213 Pharmaceutical Process Validation~~ ~~2. PR5214 Advances in Tablet Technology~~ ~~3. PR5216 Advances in Drug Delivery~~ ~~4. PR5220 Bioprocess Technology~~ ~~5. PR5225 Preformulation Science~~ ~~Group B Cluster: Regulatory & Management~~ ~~6. PR5224 Pharmacoepidemiology~~ ~~2. PR5219 Product Quality Management~~ ~~3. PR5230 Pharmacoeconomics and Outcomes Research~~ ~~4. PR5302 Regulation of Drug Development or GMS5011 Fundamentals of Pharmaceutical Regulation~~ ~~5. PR5303 Good Regulatory Practices or GMS5012 Chemistry, Manufacturing and Controls~~ ~~**Graduation Requirements**~~ ~~To graduate with the degree in Master of Science (Pharmaceutical Sciences & Technology), candidates must have achieved a CAP of at least 3.00. The maximum candidature for a part-time student is four years.~~ NUS Department of Pharmacy has been running the Master of Science (Pharmaceutical Science and Technology) [MPST] programme since 2008. This part-time course-work based programme was initiated in response to directions from EDB to train science, pharmacy and engineering personnel to be proficient and knowledge-ready to meet the needs of the pharmaceutical / biopharmaceutical industry in Singapore. To make our students relevant in the future pharmaceutical / biopharmaceutical industry, we have adopted a broad-based approach in our curriculum, to encompass the various stages of pharmaceutical/biopharmaceutical development. Prospective students who are already working in or aspiring to enter the pharmaceutical / biopharmaceutical industry are invited to apply for this programme. Currently, the programme is only available in the part-time mode and students are allowed up to 4 years to complete the programme. Upon graduation, the graduates are capable of

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			contributing in various aspects of the pharmaceutical / biopharmaceutical industry, ranging from research, formulation, processing, manufacturing, quality assurance, product management and regulatory compliance. **Learning Outcomes** Graduates from this programme will enhance their on-the-job competency by: • Gaining in-depth knowledge and practical skills for formulation and process manufacturing of chemical and biological drugs into a range of pharmaceutical dosage forms, ranging from tablets to injectables. • Acquiring understanding of the regulatory and quality compliance of pharmaceuticals in the process of drug development and manufacturing. **Admission Requirements** Prospective students will have two pathways towards the MPST part-time programme: A) Direct admission route; B) 'Stackable' route (including graduate certificate). Note: Students who have started on a selected pathway are not allowed to switch over to the other route. **A) Direct admission route** To be admitted directly into the MPST part-time programme, candidates must be holders of at least a 2nd Class Lower Honours classification (or equivalent) in one of the following degrees, or their equivalent: – Bachelor of Science (Honours) in Chemistry, or – Bachelor of Science (Honours) in Life Sciences, or – Bachelor of Applied Science (Honours) in Food Science & Technology, or – Bachelor of Applied Science (Honours) in Applied Chemistry (Drug Option), or – Bachelor of Science in Pharmacy (Honours), or – Bachelor of Engineering (Chemical Engineering) (Honours) Candidates, who do not have Honours classification in the degree pre-requisites as stipulated above, may apply for admission with GRE results. Candidates, who hold equivalent degrees from overseas universities, may apply for admission with GRE and TOEFL results. Such candidates, if found suitable, would be considered on a case-by-case basis. **B) 'Stackable' route (including graduate certificate)** The 'stackable route is for students who had completed individual modular courses and who subsequently decide to pursue the MPST degree by crediting the relevant modules taken. Candidates will require a relevant degree as listed under direct admission requirements. Students who do not fulfil the degree requirement outright can appeal with justification, and the case will be reviewed individually.

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			For more information on the 'Stackable' route (including graduate certificate), please refer to "Admission Requirements" at http://pharmacy.nus.edu.sg/msc-pharmaceutical-sciences-technology/ **Programme Structure** Candidates admitted into the Master's degree programme must read and pass a total of 10 modules (40 MC), comprising 5 core modules and 5 elective modules: 5 Core Modules, 4 MCs each: • PR5211 Pharmaceutical Analysis IV • PR5217 Formulation Science • PR5218 Methodologies in Product Development (Capstone module) • PR5198 Graduate Seminar Module in Pharmacy • PR5304 Fundamental Topics in Pharmaceutical Science 5 Elective Modules, 4 MCs each; To be chosen from any of the following: • PR5213 Pharmaceutical Process Validation • PR5214 Advances in Tablet Technology • PR5216 Advances in Drug Delivery • PR5220 Bioprocess Technology • PR5225 Preformulation Science • PR5219 Product Quality Management • PR5224 Pharmacoepidemiology • PR5230 Pharmacoeconomics and Outcomes Research • GMS5011 Fundamentals of Pharmaceutical Regulation *(offered by Centre of Regulatory Excellence (CoRE), Duke-NUS Medical School)* • GMS5012 Chemistry, Manufacturing and Controls *(offered by Centre of Regulatory Excellence (CoRE), Duke-NUS Medical School)* For more information, please refer to "Programme Structure" at http://pharmacy.nus.edu.sg/msc-pharmaceutical-sciences-technology/ **Graduation Requirements** To graduate with the degree in Master of Science (Pharmaceutical Science and Technology), candidates must have achieved a CAP of at least 3.00. Change #8 Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/doctor-of-pharmacy-pharmd/

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			~~**Criteria for Admission**~~ ~~•Candidates must be holders of the following degree, or its equivalent:~~ ~~Bachelor of Science in Pharmacy (Honours).~~ ~~•Candidates must have fulfilled the pre-registration pharmacist training requirements and registered to practise Pharmacy.~~ ~~•Preference for those with relevant work experience as a pharmacist (hospital, community etc.)~~ ~~•Candidates will also be evaluated based on an interview, their written statement of career goals and at least three letters of recommendation.~~ ~~**Special Criteria for Admission**~~ ~~•Candidates, who do not have Honours classification in the degree pre-requisites as stipulated above, may apply for admission with GRE results. Candidates, who hold equivalent degrees from overseas universities, may apply for admission with GRE and TOEFL results. Such candidates, if found to be suitable, would be submitted for approval by Board of Graduate Studies on a case-by-case basis.~~ ~~•Candidates, who have not read and passed the following 6 essential Pharmacy modules or their equivalents, will have to read and obtain good passes for them prior to admission. •PR1103 Pharmacy Practice I~~ ~~•PR3105 Pharmacotherapy I~~ ~~•PR3107 Pharmacy Practice II~~ ~~•PR4101 Pharmacotherapy II~~ ~~•PR4102 Pharmacotherapy III~~ ~~•PR4104 Pharmacy Practice III~~ ~~**Programme Structure**~~ ~~1.Length of Study~~ ~~Full-Time Programme may be completed over 2 academic years. The didactic component may be completed during the first 10-months followed by the clerkship rotations over the following 40-50 weeks.~~ ~~Part-Time Programme may be completed over 4-6 academic years. The didactic component may be completed over a period of 22 to 34 months followed by the clerkship rotations during the following 2 to 3 academic years, by completing 2-3 rotations per academic year.~~ ~~2.Curriculum~~ ~~The didactic component of the programme consists of 12 modules, comprising 8 essential Level 5000 modules and 4 elective Level 5000 modules as described below:~~

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			~~Didactic Coursework~~ ~~Essential Modules (28 MC)~~ ~~•PR5113 Clinical Pharmacokinetics and Therapeutic Drug Monitoring (4 MC)~~ ~~•PR5130 Advanced Pharmacotherapy I (Infectious Diseases, Neuropsychiatric Disorders) (4 MC)~~ ~~•PR5131 Advanced Pharmacotherapy II (Thyroid Disorders, Fluid and Electrolyte Disorders, Cardiovascular Therapeutics, Toxicology, Emergency Medicine) (4 MC)~~ ~~•PR5132 Advanced Pharmacotherapy III (Haematologic, Oncologic and Immunologic disorders) (4 MC)~~ ~~•PR5133 Advanced Pharmacotherapy in Special Populations (Paediatric and Geriatric Diseases/Conditions) (2 MC)~~ ~~•PR5134 Physical Assessment and Diagnostic Tests (Medication History, Communication Skills, Physical Assessment Skills) (4 MC)~~ ~~•PR5135 Foundations in Advanced Pharmacy Practice (Literature Evaluation & Drug Information, Biostatistics, Research Methodology & Clinical Research) (4 MC)~~ ~~•PR5136 PharmD Seminar (2 MC)~~ ~~Elective Modules (16 MC) – undertake all coursework modules OR the clinical research project (PR5239) + coursework module(s)~~ ~~•PR5230 Pharmacoeconomics and Outcomes Research (4 MC)~~ ~~•PR5231 Complementary and Alternative Medicine (4 MC)~~ ~~•PR5232 Nutrition, Disease Prevention and Health Promotion (2 MC)~~ ~~•PR5233 Pharmacy Practice Management (4 MC)~~ ~~•PR5234 Pharmacogenomics and Pharmacogenetics (4 MC)~~ ~~•PR5235 Ethics in Pharmacy Practice (2 MC)~~ ~~•PR5239 Clinical Pharmacy Research Project (12 MC)~~ ~~Clerkships~~ ~~All PharmD candidates must complete 40 weeks of clerkship consisting eight 5-week attachments at various practice settings. The clerkship component of the programme aims to provide hands-on application of the knowledge gained in the first-year modules, and to develop the clinical skills necessary to provide advanced pharmaceutical care.~~ ~~•Compulsory clerkships (25 MC) (5 weeks each, total of 25 weeks)~~ ~~This will consist of clerkships in the following areas:~~ ~~•PR5150 Ambulatory Care (5 MC)~~ ~~•PR5151 Adult Acute Care Medicine (5 MC)~~ ~~•PR5152 Adult General Medicine (5 MC)~~ ~~•PR5153 Critical Care Medicine (5MC)~~ ~~•PR5154 Drug Information (5 MC)~~

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			~~•Elective clerkships (15 MC) (5 weeks each, total of 15 weeks)~~ ~~This will consist of three 5-week attachments to allow students to gain exposure to a broad range of pharmacy practice settings, as well as to allow them to pursue areas of personal interest. Options for elective clerkships will depend on available resources and clerkship sites.~~ ~~•PR5250 Elective Clerkship I (5 MC)~~ ~~•PR5251 Elective Clerkship II (5 MC)~~ ~~•PR5252 Elective Clerkship III (5 MC)~~ ~~Graduation Requirements~~ ~~Candidates will need to complete 44 MC worth of modules plus clerkships (40 MC) as indicated in the curriculum. To graduate with the PharmD degree, the candidate must have achieved a CAP of at least 3.5 for all 12 modules, in addition to passes for all eight clinical clerkships.~~ **Criteria for Admission** Candidates must be holders of the following degree, or its equivalent: Bachelor of Science in Pharmacy (Honours). Candidates must have fulfilled the pre-registration pharmacist training requirements and registered to practise Pharmacy in Singapore. Preference for those with relevant work experience as a pharmacist (hospital, community etc.) Candidates will also be evaluated based on an interview, their written statement of career goals and at least three letters of recommendation. **Programme Structure** gth of Study Full-Time Programme may be completed over 2 academic years. The didactic component may be completed during the first 10-months followed by the clerkship rotations over the following 40-50 weeks. Part-Time Programme may be completed over 4-6 academic years. The didactic component may be completed over a period of 22 to 34 months followed by the clerkship rotations during the following 2 to 3 academic years, by completing 2-3 rotations per academic year. riculum

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			The didactic component of the programme consists of 16 modules, comprising 10 essential Level 5000 modules and 6 elective Level 5000 modules as described below. Students must read the 10 essential Level 5000 modules and choose upto 3 elective Level 5000 modules. **Didactic Coursework** **Essential Modules (38 MC)** • PR5135 Foundations in Advanced Pharmacy Practice (4 MC) ○ Statistics, research methodology, clinical research, drug information, literature evaluation, quality improvement, drug use evaluation • PR5134 Advanced Skills in Pharmacy Practice (4 MC) ○ History taking, clinical documentations, communication skills, basic physical assessment skills, simulation-based training • PR5136 Pharm.D. Seminar & Teaching (4 MC) ○ Presentation skills, peer evaluation, teaching of undergraduate students • PR5113 Clinical Pharmacokinetics and Therapeutic Drug Monitoring (4 MC) ○ Basic pharmacokinetics, pharmacokinetics and dynamics in renal impairment, hepatic impairment, oncology, vancomycin, aminoglycosides, antiepileptics, immunosuppressants, antifungals • PR5130 Advanced Pharmacotherapy I (2 MC) ○ Infectious diseases, hepatology • PR5131 Advanced Pharmacotherapy II (2 MC) ○ Acute cardio, stroke, fluid and electrolytes • PR5132 Advanced Pharmacotherapy III (2 MC) ○ Oncology & supportive care • PR5133 Advanced Pharmacotherapy in Special Populations (2 MC) ○ Pediatrics, women's health • PR5133 Advanced Pharmacotherapy in Geriatrics (2 MC) • PR5239 Clinical Pharmacy Research Project (12 MC) ○ Study design, IRB application, data collection and analysis, research report, presentations. **Elective Modules (6 MC)** – undertake 2 to 3 elective modules to make up 6 MC • PR5230 Pharmacoecomomics and Outcomes Research (4 MC) ○ Pharmacoeconomics studies (CEA, CUA, CBA, CMA), HRQoL, modelling • PR5230A Pharmacoecomomics (2 MC) • PR5237 Management of Older Patients (2 MC) • PR5131A Advanced Pharmacotherapy IIA (2 MC) ○ Emergency medicine and critical care

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• PR5132A Advanced Pharmacotherapy IIIA (2 MC) ○ Haematology and immunology • PR5234A Concepts in Pharmacogenomics (2 MC) **Clerkships** All PharmD candidates must complete 40 weeks of clerkship consisting eight 5-week attachments at various practice settings. The clerkship component of the programme aims to provide hands-on application of the knowledge gained in the didactic modules, and to develop the clinical skills necessary to provide advanced pharmaceutical care. • Compulsory clerkships (20 MC) (5 weeks each, total of 20 weeks) This will consist of clerkships in the following areas: ○ PR5150 Ambulatory Care (5 MC) ○ PR5151 Adult Acute Care Medicine (5 MC) ○ PR5152 Adult General Medicine (5 MC) ○ PR5154 Drug Information (5 MC) • Elective clerkships (20 MC) (5 weeks each, total of 20 weeks) This will consist of four 5-week attachments to allow students to gain exposure to a broad range of pharmacy practice settings, as well as to allow them to pursue areas of personal interest. Options for elective clerkships will depend on available resources and clerkship sites. ○ PR5250 Elective Clerkship I (5 MC) ○ PR5251 Elective Clerkship II (5 MC) ○ PR5252 Elective Clerkship III (5 MC) ○ PR5253 Elective Clerkship IV (5 MC) **Graduation Requirements** Candidates will need to complete 44 MC worth of modules plus clerkships (40 MC) as indicated in the curriculum. To graduate with the PharmD degree, the candidate must have achieved a CAP of at least 3.5 for all essential and elective modules, in addition to passes for all eight clinical clerkships.
35.	26 Jul 2019	FoS	**Updates for Bulletin AY2019/20 (as of 26 Jul 2019)**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
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 (AY19/20 in this case)

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

<u>Current text:</u>
<table>
<tr><td>Statistics (ST)</td></tr>
<tr><td>Statistics (with specialisation in Biostatistics) (ST)</td></tr>
<tr><td>Statistics (with specialisation in Finance and Business Statistics) (ST)</td></tr>
</table>
<u>Revised text:</u>
<table>
<tr><td>Statistics (ST)</td></tr>
<tr><td>Statistics (with specialisation in Biostatistics) (ST) (For Cohort 2015 and earlier)</td></tr>
<tr><td>Statistics (with specialisation in Data Science) (For Cohort 2016 onwards)</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Statistics (with specialisation in Finance and Business Statistics) (ST) --- **General clean-up of page links for consistency (did not arise from any circular/meeting)** **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/ **Current text:** 3.4.4 Double Degree Programmes in Law [LLB (Hons)] 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~~ **Revised text:** 3.4.4 Double Degree Programmes in Law [LLB (Hons)] 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

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			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 Joint Bachelor of Science (Honours) in Life Sciences from National University of Singapore and Bachelor of Science (Honours) in Biological Sciences/Biomedical Sciences from University of Dundee 3.4.9 Concurrent Programme in Bachelor of Science in Life Sciences of National University of Singapore and Doctor of Veterinary Medicine of University of Melbourne 3.4.10 Concurrent MSc (Mgt) and BSc (Hons) / BApplSc (Hons)
36.	19 Aug 2019	FoS	**Updates for Bulletin AY2019/20 (as of 19 Aug 2019)** **Circular title:** FoS: Mathematics and DSAP – Proposal to Restrict Statistics Major Students from taking the Minor in Financial Mathematics **Circular no.:** BUS Cir01, AY2019/20 dated 8 August 2019 **To be changed for cohort number(s):** AY19/20 only **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-financial-mathematics/ **Current text:** 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. **Revised text:** This minor is not awarded with the primary major in Applied Mathematics, Statistics, Quantitative Finance, Mathematics, Data Science and Analytics, and second major in Mathematics, Data Analytics.
37.	23 Sep 2019	FoS (GD)	**NUS Bulletin 2019/20 – Updates by FoS (GD) - 23 Sep 2019**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>Dept of Pharmacy needs to make a change for one of their modules. Please amend as indicated in red below:

Page: http://www.nus.edu.sg/nusbulletin/faculty-of-science/graduate-education/coursework-programmes/degree-requirements/doctor-of-pharmacy-pharmd/

• Elective clerkships (20 MC) (5 weeks each, total of 20 weeks)

This will consist of four 5-week attachments to allow students to gain exposure to a broad range of pharmacy practice settings, as well as to allow them to pursue areas of personal interest. Options for elective clerkships will depend on available resources and clerkship sites.

○ PR5250 Elective Clerkship I (5 MC)
○ PR5251 Elective Clerkship II (5 MC)
○ PR5252 Elective Clerkship III (5 MC)
○ ~~PR5253 Elective Clerkship IV (5 MC)~~
○ PR5153 Critical Care Clerkship (5 MC)</td></tr>
<tr><td>38.</td><td>1 Nov 2019</td><td>FoS</td><td><u>Updates for Bulletin AY2019/20 (as of 1 Nov 2019)</u>

To be changed for cohort number(s): AY19/20 only

Link: http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/bachelor-of-science-pharmacybachelor-of-science-pharmacy-hons-b-sc-pharm-b-sc-pharm-hons/

<u>Current text:</u>
<table><tr><td>Level-4000 (28 MCs)</td><td>Pass <u>either</u>:
(i) The following 4 modules:
PR4138 Pharmacy Professional Skills Development IV</td><td>124</td></tr></table></td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
				PR4197A Pharmacy Internship I PR4198A Pharmacy Internship II PR4196 Pharmacy Research Project and Scientific Communication **OR** (ii) PR4195 Scientific Evaluation, Analysis and Communication (12 MCs) **and** any one of the following modules: PR3202 Community Health & Preventive Care PR4201 Pharmaceutical Marketing PR4205 Bioorganic Principles of Medicinal Chemistry PR4207 Applied Pharmacokinetics & Toxicokinetics	
			Revised text:		
			Level-4000 (28 MCs)	Pass ~~either:~~ ~~(i) The following 4 modules:~~ PR4138 Pharmacy Professional Skills Development IV PR4197A Pharmacy Internship I PR4198A Pharmacy Internship II **Final Year Project** PR4196 Pharmacy Research Project and Scientific Communication **OR**	12 4

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			(ii) PR4195 Scientific Evaluation, Analysis and Communication (12 MCs) **and** any one of the following modules: PR3202 Community Health & Preventive Care PR4201 Pharmaceutical Marketing PR4205 Bioorganic Principles of Medicinal Chemistry PR4207 Applied Pharmacokinetics & Toxicokinetics
39.	17 Dec 2019	FoS	**Updates for Bulletin AY2019/20 (as of 17 Dec 2019)** **To be changed for cohort number(s):** AY19/20 and onwards **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/ **Current text:** 3.3.3 Bachelor of Science/Bachelor of Science (Hons.) Programme Requirements [B.Sc./B.Sc. (Hons.)] 3.3.3.1 Chemistry 3.3.3.2 Computational Biology

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			3.3.3.3 Food Science and Technology 3.3.3.4 Data Science and Analytics 3.3.3.5 Life Sciences 3.3.3.6 Mathematics and Applied Mathematics 3.3.3.7 Pharmaceutical Science 3.3.3.8 Physics 3.3.3.9 Quantitative Finance 3.3.3.10 Statistics 3.3.4 Bachelor of Science (Pharmacy)/Bachelor of Science (Pharmacy) (Hons.) [B.Sc. (Pharm.)/B.Sc. (Pharm.) (Hons.)] 3.4 Multidisciplinary Opportunities **Revised text:** 3.3.3 Bachelor of Science/Bachelor of Science (Hons.) Programme Requirements [B.Sc./B.Sc. (Hons.)] 3.3.3.1 Chemistry 3.3.3.2 Computational Biology 3.3.3.3 Food Science and Technology 3.3.3.4 Data Science and Analytics 3.3.3.5 Life Sciences 3.3.3.6 Mathematics and Applied Mathematics 3.3.3.7 Pharmaceutical Science 3.3.3.8 Physics

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			3.3.3.9 Quantitative Finance 3.3.3.10 Statistics 3.3.4 Bachelor of Science (Pharmacy)/Bachelor of Science (Pharmacy) (Hons.) [B.Sc. (Pharm.)/B.Sc. (Pharm.) (Hons.)] 3.3.5 Bachelor of Environmental Studies Programme 3.4 Multidisciplinary Opportunities
40.	7 Jan 2020	FoS	**Updates for Bulletin AY2019/20 (as of 17 Dec 2019)** **To be changed for cohort number(s):** AY19/20 and onwards **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degrees-offered/ **Current text:** **Pharmacy, Computational Biology, Data Science and Analytics, and Pharmaceutical Science are strict four-year programmes, while all other programmes allow for graduation after three years with a general Bachelor of Science degree.* **Revised text:** **Pharmacy, Computational Biology, Data Science and Analytics, Food Science and Technology and Pharmaceutical Science are strict four-year programmes, while all other programmes allow for graduation after three years with a general Bachelor of Science degree.* **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/honours-eligibility-and-honours-projects/

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Current text: 1. Students who matriculated in and after AY2012/2013 (excluding those majoring four-year programmes: Computational Biology, Data Science and Analytics, Pharmaceutical Science and Quantitative Finance), and students who matriculate in and after AY2014/15 majoring in Quantitative Finance will be eligible for Honours if they have: 2. The Computational Biology, Data Science and Analytics, Pharmaceutical Science majors are four-year programmes leading to a Bachelor of Science (Hons.) degree, subject to a minimum CAP attainment. **Revised text:** 1. Students who matriculated in and after AY2012/2013 (excluding those majoring four-year programmes: Computational Biology, Data Science and Analytics, Pharmaceutical Science, Food Science & Technology and Quantitative Finance), and students who matriculate in and after AY2014/15 majoring in Quantitative Finance will be eligible for Honours if they have: 2. The Computational Biology, Data Science and Analytics, Pharmaceutical Science and Food Science & Technology majors are four-year programmes leading to a Bachelor of Science (Hons.) degree, subject to a minimum CAP attainment. --- **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degree-requirements/curriculum-structure-and-graduation-requirements/faculty-requirements/ **Current text:**

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

University Scholars Programme (USP)	Students who have passed the following Inquiry modules under the USP revised curriculum (for Cohort 2012/13 onwards) can count it towards Faculty requirements as follows: UITXXXX- Counted towards Computing Sciences subject group UPC2209 – Counted towards Physical Sciences subject group UPC2208-Counted towards Chemical Sciences subject group UPC2207- Counted towards Physical Sciences subject group UPC2206- Counted towards Physical Sciences subject group ULSXXXX- Counted towards Life Sciences subject group UQRXXXX- Counted towards Mathematical & Statistical Sciences group UNLXXXX- Counted towards Multidisciplinary & Interdisciplinary Sciences group

Revised text:

University Scholars Programme (USP)	Students who have passed the following Inquiry modules under the USP revised curriculum (for Cohort 2012/13 onwards) can count it towards Faculty requirements as follows: UITXXXX- Counted towards Computing Sciences subject group UPC2209 - Counted towards Physical Sciences subject group UPC2208-Counted towards Chemical Sciences subject group UPC2207- Counted towards Physical Sciences subject group UPC2206- Counted towards Physical Sciences subject group ULSXXXX- Counted towards Life Sciences subject group UBMXXXX - Counted towards Life Sciences subject group

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>UQRXXXX- Counted towards Mathematical & Statistical Sciences group
UNLXXXX- Counted towards Multidisciplinary & Interdisciplinary Sciences group
UPC2210 - Counted towards Multidisciplinary & Interdisciplinary Sciences group
UPC2204 - Counted towards Multidisciplinary & Interdisciplinary Sciences group
UPC2211 - Counted towards Multidisciplinary & Interdisciplinary Sciences group</td></tr>
<tr><td>41.</td><td>13 Mar2020</td><td>FoS</td><td><u>Updates for Bulletin AY2019/20 (as of 13 March 2020)</u>

To be changed for cohort number(s): Cohort AY19/20 onwards

Link: Phttp://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/second-major-programmes/

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

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

4. Mathematics	H2 pass in Mathematics or equivalent
5. Physics	H2 pass in Physics or equivalent
6. Statistics	H2 pass in Mathematics or equivalent

Revised text:

SECOND MAJOR	PREREQUISITES
1. Chemistry	H2 pass in Chemistry or equivalent
2. Data Analytics	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.
3. Food Science	Good H2 pass in at least two science subjects; one of them should be Chemistry
~~3.~~ 4 Life Sciences	H2 passes or equivalent in Biology, Chemistry AND either Mathematics or Physics
~~4.~~ 5 Mathematics	H2 pass in Mathematics or equivalent
~~5.~~ 6 Physics	H2 pass in Physics or equivalent
~~6.~~ 7 Statistics	H2 pass in Mathematics or equivalent

To be changed for cohort number(s): Cohort AY19/20 onwards

Link: http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/double-major-and-major-minor-combinations/

Current text:

Up to 8MC of the Minor may be double counted with the Primary Major or Second Major requirements, and up to 16 MCs of the Second Major may be double counted with the Primary Major requirements. Please refer to the following Faculty of Science website for the complete double-counting rules: http://www.science.nus.edu.sg/undergraduate-studies/ugfaq/faq-current#dblcount [Please refer to both 1. What is double-counting and when is double counting allowed? and 2. Is Faculty requirement part of the double counting policy?].

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Revised text: Up to 8MC of the Minor may be double counted with the Primary Major or Second Major requirements, and up to 16 MCs of the Second Major may be double counted with the Primary Major requirements. Please refer to the following Faculty of Science website for the complete double-counting rules: ~~http://www.science.nus.edu.sg/undergraduate-studies/ugfaq/faq-current#dblcount~~ https://www.science.nus.edu.sg/wp-content/uploads/2020/02/UG_FAQ-1.pdf [Please refer to both 1. What is double-counting and when is double counting allowed? and 2. Is Faculty requirement part of the double counting policy?].
42.	8 Apr 2020	FoS	**Updates for Bulletin AY2019/20 (as of 8 April 2020)** **To be changed for cohort number(s): Cohort AY19/20 onwards** **Link:** Page http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/degrees-offered/ **Current text:** The Chemistry, Life Sciences, Applied Mathematics, Physics and Statistics majors offer general B.Sc.(Hons.) programmes as well as B.Sc.(Hons.) programmes with specialisation. **Revised text:** The Chemistry, Life Sciences, Applied Mathematics, Physics and Statistics majors offer general B.Sc./ B.Sc.(Hons.) programmes as well as B.Sc.(Hons.) programmes with specialisation.
43.	21 May 2020	FoS	**Updates for Current Bulletin AY19/20** **Link:** http://www.nus.edu.sg/nusbulletin/faculty-of-science/ **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

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

Link: 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/

Current and Revised text:

Programme Requirements		MCs
Level-1000 / 2000 Essential [1]		
CS1010S or CS1010X Programming Methodology [3]	4	
CS2040 Data Structures and Algorithms	4	
CS1231 Discrete Structures or MA1100 Fundamental Concepts of Mathematics	4	
LSM1106 Molecular Cell Biology	4	
MA1102R Calculus	4	~~32 – 36~~ 36
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	

Programme Requirements	MCs
Level-3000 Electives [4] (Choose Four Modules) – [Any two modules from option A and any two modules from option B]	16
Option A	
CS2102 Database System	
CS3103 Computer Networks Practice	
CS3225 Combinatorial Methods in Bioinformatics	
CS3230 Design and Analysis of Algorithms	
CS3223 Database Systems Implementation	
CS3240 Interaction Design	
CS3241 Computer Graphics	

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)			
			CS3243 Introduction to Artificial Intelligence CS3244 Machine Learning <u>Option B</u> LSM3211 Fundamental Pharmacology LSM3223 Immunology LSM3225 Molecular Microbiology LSM3231 Protein Structure and Function LSM3232 Microbiology LSM3233 Developmental Biology LSM3243 Molecular Biophysics 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 <u>OR</u> <u>ZB4299</u> Applied Project in Computational Biology	12	~~20~~ 16	
			ZB4171 Advanced Topics in Bioinformatics	4		

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

~~LSM4241 Functional Genomics~~	~~4~~	

Programme Requirements		MCs
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]		12
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	
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	

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>LSM4241 Functional Genomics
LSM4242 Protein Engineering

<u>Option C</u>
MA4251/ ST4238 Stochastic Processes II
PC4267 Biophysics III
ST4231 Computer Intensive Statistical Methods
ST4234 Bayesian Statistics
ST4242 Analysis of Longitudinal Data
ST4248 Statistical Learning II</td><td></td></tr>
<tr><td>Unrestricted Elective Modules [4]</td><td><s>32 – 36</s>
36</td></tr>
</table>

Note 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).

<s>*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.</s></td></tr>
<tr><td>44.</td><td>4 Jun 2020</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: http://www.nus.edu.sg/nusbulletin/faculty-of-science/undergraduate-education/multidisciplinary-opportunities/minor-programmes/minor-in-pharmaceutical-science/</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Circular title: FoS: Department of Pharmacy – Major Revision to the Minor Programme in Pharmaceutical Science **Circular no.:** Senate Circular No. 14 AY2019-20 **Current text:** **Curriculum Structure and Requirements** Essential modules: PR1110 Foundations for Medicinal Chemistry PR2114 Formulation and Technology I PR2115 Medicinal Chemistry for Drug Design Either (i) PR3301 Pharmaceutical Dosage Forms or PR3117 Formulation and Technology II Choose TWO from the following elective modules: PR1301 Complementary Medicine and Health PR2143 Pharmaceutical Analysis for Quality Assurance PR3204 Medicinal Natural Products 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:

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			PR1301 Complementary Medicine and Health 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
45.	20 Jun 2020	FoS	**Weblink:** 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/physics/ **3.3.3.8 Physics** Changes to be made in red: **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; and (iii) Quantum Technologies. These programmes will prepare graduates with in-depth knowledge in each area of specialisation.
46.	28 Feb 2020	Yale-NUS	Senior Vice Provost Prof Bernard Tan had approved Yale-NUS' request for updates to the Yale-NUS transcript (14 Jan 2020). Included the Latin Honours under Yale-NUS at 'Transcript Information and Grade Legend' webpage (http://www.nus.edu.sg/registrar/docs/info/administrative-policies-procedures/transcript-information-grade-legend.pdf).

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
Honours Awards
The College awards Latin Honours to the top 35 percent of the graduating class as follows:

<table>
<tr><td>Summa Cum Laude</td><td>To not more than the top 5 percent of the graduating class.</td></tr>
<tr><td>Magna Cum Laude</td><td>To not more than the next 10 percent of the graduating class.</td></tr>
<tr><td>Cum Laude</td><td>To not more than the next 20 percent of the graduating class.</td></tr>
<tr><td colspan="2">• Latin Honours will go to no more than 35 percent of a graduating class.

• The graduating class is defined as graduates who entered the College at the same time unless the student has been tagged by the College to graduate with a later cohort due to promotion rules or other official reasons.</td></tr>
</table>

The Latin Honours are based on the Cumulative Average Point (CAP). In addition, no more than 60% or 6 of the students (whichever is larger) in any one major will receive honours at the Cum Laude level or above, and no more than 40% or 4 (whichever is larger) at the Magna Cum Laude level or above. In cases where the number of students might exceed these limits, only the top students down to the designated limits will receive the relevant honour.
</td></tr>
<tr><td>47.</td><td>1 Jul 2019</td><td>CFG</td><td>
Centre for Future-ready Graduates (CFG)
CFG is a new-era career centre that helps students thrive in a world of constant change, ensuring they are ready for their future careers. The Centre provides students with access to career-readiness programmes, on-demand career support, employer engagement events, real-world experiences, and more.

• Career-Readiness Programmes: (change this subheading’s font color to black)
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Career Catalyst: It's never too early to start thinking about career preparation. CFG's foundational career preparation module helps year one students to kick start their career planning early so they can maximise their time at university. ***Career Booster Workshop Series:*** Conducted by experts in their respective fields, these workshops provide students with advanced interviewing techniques to help them secure their first job. Workshops cover topics such as assessment centres, digital interviews, case interviews and presentations. ***Career Accelerator:*** The future is all about skills. CFG organises skill-building programmes throughout the semester to help increase student employability – focusing on transferable soft skills such as collaboration, resilience, adaptability and productivity. • On-Demand Career Support: *(change this subheading's font color to black)* For immediate career support, a range of digital resources is available to students, 24/7. Students may visit CFG's website to access digital feedback tools and how-to guides on digital interviewing practice, resume writing, and job search strategies. For personalised expert advice, students may request a meeting with one of CFG's certified Career Advisors on NUS TalentConnect. • Employer Engagement: *(change this subheading's font color to black)* Employers look for talent throughout the year. That's why CFG fills each semester with career fairs, recruitment talks, and networking sessions – giving students plenty of opportunities to find their next opportunity. • Real-World Experience: *(change this subheading's font color to black)*

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>One of the best ways for students to prepare for the working world is to immerse themselves in it. CFG helps facilitate internship opportunities for students in Singapore and overseas – from non-profit organisations and MNCs, to SMEs and start-ups.

• NUS TalentConnect: (change this subheading's font color to black)
The dedicated job portal for NUS students and alumni. Students may log on to access more than 1,000 jobs and internships in Singapore and overseas.</td></tr>
<tr><td>48.</td><td>13 Feb 2020</td><td>CTPCLC</td><td>Minor Programmes website (13 Feb 2020)

Please create hyperlink for the CTPCLC's minor programme as highlighted in red below. Thanks.

http://www.nus.edu.sg/registrar/academic-information-policies/undergraduate-students/special-programmes/minor-programmes

<table>
<tr><th>Minor</th><th>Host Faculty/Department</th><th>Type</th></tr>
<tr><td>University Scholars Programme (USP)</td><td></td><td></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>
<tr><td>Chua Thian Poh Community Leadership Centre</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Community Development and Leadership *Please hyperlink this minor to the specific section on **'Minor in Community Development & Leadership' at** CTPCLC's website **(https://ctpclc.nus.edu.sg/curriculum)***	Chua Thian Poh Community Leadership Centre	Open
49.	24 Dec 2019	UTCP	**Bulletin 4.1 Admission Requirements** (http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/university-town-college-programme/admission-requirements/) Incoming freshmen may apply for the UTCP concurrently with or after their NUS application. Admission into the UTCP is contingent upon the acceptance of an offer to pursue an undergraduate degree programme in NUS. A small number of current undergraduates may be admitted on a case-by-case basis. The senior admissions exercise is not applicable to: • Students enrolled or previously enrolled in the UTCP at College of Alice & Peter Tan, Residential College 4 and Tembusu College; • Students enrolled or previously enrolled in the University Scholars Programme; and • Students enrolled or previously enrolled in Ridge View Residential College Programme. Interested applicants should submit an online application via the Joint Residential College Application System. Shortlisted candidates will be invited for an interview. You will be assessed based on your essay(s) and interview, in addition to your academic achievements and co-curricular experiences.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			In your application you may indicate your preference, if any, for either College of Alice & Peter Tan, Residential College 4 or Tembusu College, but your eventual placement (if selected) may be different. Only one application may be submitted per Academic Year. **Bulletin 4.2 Programme Requirements** (http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/university-town-college-programme/programme-requirements/) Incoming Freshmen admitted to the UTCP will be offered a two-year residency in either College of Alice & Peter Tan, Residential College 4 or Tembusu College, during which you should complete the UTCP curriculum comprising five modules: • A Junior Seminar and Ideas & Exposition 1 typically in the first year, and • Two Senior Seminars (one with a Singapore Studies focus) and Ideas & Exposition 2 typically in the second year. Alternative learning pathways are designed for students from Law, Medicine, Dentistry, and selected programmes with curricular restrictions (e.g. Nursing, Music, and Joint Degree Programmes) to still read modules as part of the residential college experience. For current undergraduates, the residency and curricular requirements are as follows: • Current undergraduates admitted in your Year 1 Semester 2 will be offered a three-semester residency during which you are expected to read four modules (and strongly encouraged to complete the five-module UTCP curriculum).

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>• Current undergraduates from Year 2 onwards will be offered a one-year residency if you are admitted in Semester 1, or a one-semester residency if you are admitted in Semester 2. For both cases, you should read one module with your College during the offered residency period.</td></tr>
<tr><td>50.</td><td>17 Feb 2020</td><td>UTCP</td><td>4.3 UTCP and Fulfilment of Graduation Requirements
(http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/university-town-college-programme/utcp-and-fulfilment-of-graduation-requirements/)

Students from faculties in the modular system are required to complete five General Education (GE) modules under the NUS GE curriculum. For cohorts admitted from AY2016/2017 onwards, students who complete the UTCP are exempted from four of the five modules of the GE curriculum. This means that four UTCP modules will be read in place of the GE modules and the fifth UTCP module is taken as an Unrestricted Elective (UE) or Faculty requirements (if applicable).
The university requires all undergraduates (with the exception of Law, Medicine, Dentistry and Nursing) to complete the GER1000 Quantitative Reasoning (QR) module. This is the fifth GE module, and serves to complete the GE requirement for UTCP students. This module will be pre-allocated for you to read in your first or second semester. Students who do not have the opportunity to complete the UTCP may seek exemptions from certain GE pillars based on the UTCP modules read to date, subject to the GE Committee's approval.
In some instances, Ideas & Exposition modules may be read in lieu of other writing / communication modules offered by the Centre for English Language Communication, which are graduation requirements for selected Faculties. Notwithstanding, each I&E module may only count towards either Faculty requirements or University Level Requirements but not double-counted towards both.

<table>
<tr><th>UTCP Module</th><th>Graduation Requirement to Fulfil</th><th>Module to Substitute</th></tr>
<tr><td>Ideas & Exposition 1 (UTW1001x*)
OR
Ideas & Exposition 2 (UTW2001x*)</td><td>Engineering: Critical Thinking and Writing requirement</td><td>ES1531 (for students admitted in AY2018/2019 & earlier)

ES2531 (for students admitted from</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 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>AY2019/2020 onwards)</td></tr>
<tr><td></td><td>Art and Social Sciences: Writing, Expression and Communication requirement</td><td>FAS1101</td></tr>
<tr><td></td><td>Science (except Pharmacy and Environmental Studies): Faculty writing requirement</td><td>SP1541</td></tr>
</table>
*x represents a letter suffix which denotes the topic of the Ideas & Exposition module
Students whose programmes do not have University Level Requirements (namely Law, Medicine, Dentistry, Nursing, and students on Joint Degree Programmes with overseas universities) should check with their respective programme administrators on how or whether the UTCP modules may be classified for graduation.

4.4 Relevant website (http://www.nus.edu.sg/nusbulletin/other-multidisciplinaryspecial-programmes/university-town-college-programme/relevant-website/)

For more information, please visit ~~http://utown.nus.edu.sg/.~~ http://www.nus.edu.sg/osa/campus-living/residential-options/residential-colleges.

For more information on the Colleges offering the UTCP, visit http://capt.nus.edu.sg/, http://rc4.nus.edu.sg/, and http://tembusu.nus.edu.sg/</td></tr>
<tr><td>51.</td><td>19 Jul 2019</td><td>OSA</td><td>Office of Student Affairs

The Office of Student Affairs (OSA) is committed to provide a rich and memorable student experience in NUS. OSA considers students' perspectives and creates opportunities to enrich their campus life. OSA endeavours to develop a student-centric environment and administration through a wide range of support services, educational, cultural, social programming, and resources.

The type of services, programmes and activities OSA offers:</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• **Student Service Centre**: A convenient contact point for students to obtain information and services related to academic/administrative student records, tuition fees and financial matters; • **Hostel Admission Services**: Manage student housing, application eligibility and procedures; • **Residential Life**: Assist students to settle in and experience a positive and vibrant residential life through social, cultural and sports activities, and enrichment programmes; • **Student Organisations**: Provide a framework of governance for NUS student organisations to thrive and contribute to student life and campus vibrancy; • **Community Engagement**: Promote and support student engagement with the community within the university, and with society beyond the university; • **Training & Development**: Develop and execute experiential learning programmes focussing on leadership and life-skills for the NUS student community; • **Sports**: Promote a healthy lifestyle through sports and recreation, and sports excellence; • **Student Support Services (S3)**: Support students' wellbeing and strengthen mental health services in a safe and inclusive space as they navigate their journey in NUS; • **Disability Support & Services**: Provide an inclusive and nurturing academic environment to students with disabilities and special education needs to achieve their fullest potential;
52.	1 Jul 2019	RO	To amend as indicated in red below and note the comment in purple General Information http://www.nus.edu.sg/nusbulletin/general-information/resources-and-services/ Resources and Services Home / NUS Bulletin AY2019/20 / General Information / Resources and Services Some of the available resources and services at NUS are as follows: Office of Admissions The Office of Admissions oversees all matters pertaining to undergraduate admissions, including recruitment, transfer of degree courses, student financial aid and award of NUS scholarships.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Campus Services The Office of Campus Amenities oversees the retail and dining services and transport, logistics and car parks in NUS with the aim of delivering quality service and excellence to the stakeholders in campus. NUS Centre For the Arts Established in 1993, NUS Centre For the Arts (CFA) is a vibrant space for the appreciation of the arts and nurturing of the creative and inquiring spirit. We support student engagement with the arts and the integration of the arts into the life of the University. We comprise the NUS Museum, NUS Baba House and a Talent and Development arm that oversees 22 student arts excellence groups. Through our myriad of programmes, practices, exhibitions, workshops and outreach, such as NUS Arts Festival and the ExxonMobil Campus Concerts, we enrich the university experience and contribute to the building of knowledge and transformation of students. We also manage facilities such as the University Cultural Centre, with its 1700-seat Hall and 425-seat Theatre, and rehearsal spaces in Runme Shaw CFA Studios and University Town. For more information, visit cfa.nus.edu.sg NUS Information Technology The NUS Information Technology spearheads the IT development on campus for teaching, learning, research and administration. We collaborate with the faculty, staff and students for innovative IT solutions to meet the diverse needs of the community. Our roles and responsibilities range from IT governance to modernization, digital transformation, Cloud adoption, system integration, campus network, research computing, student, mobile and enterprise applications, messaging, data analytics, cyber security and end user computing.

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			NUS Co-op The NUS Multi-purpose Co-operative Society Limited (NUS Co-op) offers a wide range of products including books, course packs, stationery and sundry items, and computer hardware, software and accessories. It has a wide membership in the community. Among the various services it provides are a book assistance scheme and several community service schemes. Office of ~~Financial Services~~Finance The Office of ~~Financial Services~~Finance is responsible for the University's financial policies and procedures, billing and collection of tuition fees, shared financial services, treasury, controllerships, financial reporting and stewardship of the University's financial resources. University Health Centre The University Health Centre (UHC) consists of three ~~Divisions~~Units, each handling different aspects of health and wellness for the NUS community: • Health Service provides comprehensive medical care • Wellness Outreach promotes a healthy and balanced lifestyle • University Counselling Services provides mental health support Global Relations Office The Global Relations Office is responsible for forging and maintaining relations with international partners and collaborators around the world to make available various study abroad and student exchange opportunities. The Office also promotes NUS by developing international initiatives to enhance the University's global standing. NUS Libraries NUS Libraries plays a pivotal role in partnering the NUS community in advancing scholarship and research. It comprises eight libraries, with the Central Library being the largest and C J Koh Law Library and Medical Library

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			serving as the de facto national law and medical libraries in Singapore. It is the largest academic and research library in this region with a rich collection of more than 3 million volumes covering multidisciplinary subjects in architecture, business, engineering, humanities and social sciences, law, medicine, science, and other disciplines. NUS Libraries is a steward and repository of national and regional heritage, hosting a collection that includes treasures that date as far back as the 14th century, irreplaceable material saved from the Japanese invaders during World War 2, the world-renowned Singapore/Malaysia collection, the Biodiversity Library of Southeast Asia and archival documents from the Colonial Office records. Registrar's Office The Registrar's Office oversees the administration of academic matters including freshmen registration, module enrolment, curriculum, examinations, award of degrees, commencement, and student discipline. The Office is committed to service excellence and makes use of the latest technology to ensure efficiency and effectiveness in its administrative operations. ---------- Centre for Future-ready Graduates Replaced the following paraa: ~~The Centre for Future-ready Graduates' mission is to enhance the employability of students through career preparation and helping students develop future-ready soft skills. Through various career search strategies and career development workshops, students are empowered to take confident steps to build their careers. The Centre also partners employers in their graduate recruitment, and organizes a range of activities such as internship programs, career fairs, recruitment talks, and networking sessions for students to meet company representatives for~~

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			~~employment opportunities. The Centre has developed from the ground-up, two courses focused on student development: Career Catalyst and Roots & Wings.~~ ~~Career Catalyst~~ ~~Career Catalyst will establish an important first touch point as part of a three/four-year roadmap to engage and prepare students in creating multiple pathways for themselves. Students will be equipped with essential skills and knowledge to make informed decisions on specialisations, develop soft skills as well as gain overseas exposure and real-world industry experience. The module will consist of four lectures and two e-seminars spread across six weeks of the freshmen academic year, and is aimed to provide an early introduction to the concepts of career planning, personal branding and industry awareness. Students will learn to design a meaningful career plan, and craft their resume and cover letter, based on their particular competencies and interests.~~ ~~Roots & Wings~~ ~~In partnership with the Department of Psychology, CFG offers a self-awareness and interpersonal effectiveness module called 'Roots & Wings'. The module is based on psychology, neuroscience, and organizational behaviour, is offered as a complement to Career Catalyst. The programme comprises a series of deep dive experiential learning 'modulets', based on future-ready soft skills and healthy mindsets that employers consider important for the workplace. Examples of modulets include 'Cultivating Resilience', 'Cultivating Collaboration', and 'Cultivating the Self', which students can customize and stack depending on an assessment of their needs.~~ ~~For more information, please click here.~~ With the following: **Centre for Future-ready Graduates (CFG)** CFG is a new-era career centre that helps students thrive in a world of constant change, ensuring they are

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			ready for their future careers. The Centre provides students with access to career-readiness programmes, on-demand career support, employer engagement events, real-world experiences, and more. **Career-Readiness Programmes:** ***Career Catalyst:*** It's never too early to start thinking about career preparation. CFG's foundational career preparation module helps year one students to kick start their career planning early so they can maximise their time at university. ***Career Booster Workshop Series:*** Conducted by experts in their respective fields, these workshops provide students with advanced interviewing techniques to help them secure their first job. Workshops cover topics such as assessment centres, digital interviews, case interviews and presentations. ***Career Accelerator:*** The future is all about skills. CFG organises skill-building programmes throughout the semester to help increase student employability – focusing on transferable soft skills such as collaboration, resilience, adaptability and productivity. **On-Demand Career Support:** For immediate career support, a range of digital resources is available to students, 24/7. Students may visit CFG's website to access digital feedback tools and how-to guides on digital interviewing practice, resume writing, and job search strategies. For personalised expert advice, students may request a meeting with one of CFG's certified Career Advisors on NUS TalentConnect. **Employer Engagement:**

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			Employers look for talent throughout the year. That's why CFG fills each semester with career fairs, recruitment talks, and networking sessions – giving students plenty of opportunities to find their next opportunity. **Real-World Experience:** One of the best ways for students to prepare for the working world is to immerse themselves in it. CFG helps facilitate internship opportunities for students in Singapore and overseas – from non-profit organisations and MNCs, to SMEs and start-ups. **NUS TalentConnect:** The dedicated job portal for NUS students and alumni. Students may log on to access more than 1,000 jobs and internships in Singapore and overseas. --- Office of Student Affairs The Office of Student Affairs (OSA) is committed to provide a rich and memorable student experience in NUS. OSA considers students' perspectives and needs and creates opportunities to enrich students' campus life and community engagement. OSA endeavours to develop a student-centric environment and administration through a wide range of support services, educational, cultural, social programming, and resources. The type of services, programmes and activities OSA offers include: • **Student Service Centre**: A convenient contact point for students to obtain information and services related to academic/administrative student records, tuition fees and financial matters; • **Hostel Admission Services**: Manage student housing, application eligibility and procedures;

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• **Residential Life**: Assist students to settle in and experience a positive and vibrant residential life through social, cultural and sports activities, and enrichment programmes; • **Student Organisations**: Provide a framework of governance for NUS student organisations to thrive and contribute to student life and campus vibrancy; • **Community Engagement**: Promote and support student engagement with the community within the university, and with society beyond the university; • **Sports**: Promote a healthy lifestyle through sports and recreation, and sports excellence; • **Disability Support & Services**: Provide an inclusive and nurturing academic environment to students with disabilities and special education needs to achieve their fullest potential; • **Student Support Services (S3)**: Support students' wellbeing and strengthen mental health services in a safe and inclusive space as they navigate their journey in NUS; • **Training & Development**: Develop and execute experiential learning programmes ~~focussing~~ focusing on leadership and life-skills for the NUS student community.
53.	10 Jul 2019	RO	**Graduate Double Degree and Joint Degree Programmes with Overseas Universities** http://www.nus.edu.sg/registrar/education-at-nus/graduate-education/special-graduate-programmes/double-degree-and-joint-degree-programmes-with-overseas-universities.html Please insert the NUS-Remin DDP as indicated in red below: . . . **DDP with Yale University** Master of Business Administration from NUS and Master of Advanced Management from Yale University 1+1 Programme **DDP with Geneva University**

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>NUS Master of Laws (International Arbitration and Dispute Resolution)-Geneva Master of Laws in International Dispute Settlement (MIDS) Double Degree Programme

Double Masters Degree Programme with the Global Alliance in Management Education (CEMS)

Master of Science (Management) and the Master’s in International Management (MIM) (Global Alliance in Management Education (CEMS))

Double Masters Degree Programme with Renmin University of China
Master of Science (Real Estate), NUS and Master of Business Administration, Remin University of China
(please link to http://www.rst.nus.edu.sg/graduate/about-nus-renmin.html)

JDP with Australian National University

Master of Science (Science Communication)</td></tr>
<tr><td>54.</td><td>27 Aug 2019</td><td>RO</td><td>Amend/updated the links for the programmes as listed below. Thanks.

(http://www.nus.edu.sg/registrar/education-at-nus/graduate-education/special-graduate-programmes/double-degree-and-joint-degree-programmes-with-overseas-universities.html).

<table>
<tr><th>S/N</th><th>Faculty</th><th>DDPs/JDPs</th><th>Updated/Correct Links</th></tr>
<tr><td>1.</td><td>BIZ</td><td>DDP with Hautes Études Commerciales (HEC Paris)
Master of Business Administration (MBA)</td><td>https://mba.nus.edu.sg/wp-content/uploads/2018/02/NUS-HEC-MBA-Flyer-High-Res.pdf</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)				
				2.	BIZ	**DDP with Fudan University and Korea University** • S3 Asia MBA	https://mba.nus.edu.sg/wp-content/uploads/2018/12/S3_20182019.pdf
				3.	BIZ	**DDP with Peking University (PKU)** • Master of Business Administration (MBA)	https://mba.nus.edu.sg/wp-content/uploads/2018/12/NUS_PKU_2018_2019.pdf
				4	LKYSPP	**DDP with Institut d'Etudes Politiques de Paris (Sciences Po)** • Master in Public Policy, NUS and Master of European Affairs, Sciences Po	https://lkyspp.nus.edu.sg/graduate-programmes/double-master-degree-in-public-policy-and-european-affairs/overview
				5.	Duke-NUS	**JDP with Duke University** • Doctor of Medicine	https://www.duke-nus.edu.sg/education/our-programmes/md-programme
				6.	FoE	**JDP with Eindhoven University of Technology (Technische Universiteit Eindhoven) TU/e** • PhD	https://www.eng.nus.edu.sg/graduate/graduate-research-based-programmes/collaborative-programmes/joint-degree-programmes/nus-tu-e-joint-ph-d/

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)				
				7.	FoS	**JDP with Hebrew University** • PhD	http://www.science.nus.edu.sg/education/graduate/pg-research-programmes/pg-joint-phd-programmes
				8.	JDP with Indian Institute of Technology, Bombay		
				8a.	FoE	• PhD: Engineering	https://www.eng.nus.edu.sg/graduate/graduate-research-based-programmes/collaborative-programmes/joint-degree-programmes/nus-iit-joint-ph-d/
				8b.	SoC	• PhD: Computing	
				8c.	FoS	• PhD: Science	http://www.science.nus.edu.sg/education/graduate/pg-research-programmes/pg-joint-phd-programmes
				9.	JDP with Indian Institute of Technology, Kanpur		
				9a.	FoE	• PhD: Engineering	https://www.eng.nus.edu.sg/graduate/graduate-research-based-programmes/collaborative-programmes/joint-degree-programmes/nus-iit-joint-ph-d/
				9b.	SoC	• PhD: Computing	
				9c.	FoS	• PhD: Science	http://www.science.nus.edu.sg/education/graduate/pg-research-programmes/pg-joint-phd-programmes
				10.	JDP with Indian Institute of Technology, Madras		
				10a.	FoE	• PhD: Engineering •	https://www.eng.nus.edu.sg/graduate/graduate-research-based-programmes/collaborative-programmes/joint-degree-programmes/nus-iit-joint-ph-d/

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th colspan="4">(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td colspan="4"><table>
<tr><td>10b.</td><td>SoC</td><td>• PhD: Computing</td><td></td></tr>
<tr><td>10c.</td><td>FoS</td><td>• PhD: Science</td><td>http://www.science.nus.edu.sg/education/graduate/pg-research-programmes/pg-joint-phd-programmes</td></tr>
<tr><td>11.</td><td>FoS</td><td>JDP with King's College, London
• Joint Doctor of Philosophy Programme between the School of Biomedical Sciences, King's College London (KCL) and the Faculty of Science, NUS</td><td>http://www.science.nus.edu.sg/education/graduate/pg-research-programmes/pg-joint-phd-programmes</td></tr>
<tr><td>12.</td><td>FoE</td><td>JDP with Shanghai Jiao Tong University (SJTU)
• PhD</td><td>https://www.eng.nus.edu.sg/graduate/graduate-research-based-programmes/collaborative-programmes/joint-degree-programmes/nus-sjtu-joint-ph-d/</td></tr>
<tr><td>13.</td><td>FoE</td><td>JDP with Singapore University of Technology and Design (SUTD)
• PhD</td><td>https://www.eng.nus.edu.sg/graduate/graduate-research-based-programmes/collaborative-programmes/joint-degree-programmes/nus-sutd-joint-ph-d/</td></tr>
</table></td></tr>
<tr><td>55.</td><td>14 Jan 2020</td><td>RO</td><td colspan="4">Please insert the Minor in Data Engineering as indicated in red below:
http://www.nus.edu.sg/registrar/academic-information-policies/undergraduate-students/special-programmes/minor-programmes</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<u>Update 1</u>
<table>
<tr><td>School of Computing</td><td colspan="2"></td></tr>
<tr><td>Disciplinary Minors</td><td></td><td></td></tr>
<tr><td>Business Analytics</td><td>School of Computing</td><td>Restricted</td></tr>
<tr><td>Computer Science</td><td>School of Computing</td><td>Restricted</td></tr>
<tr><td>Information Security</td><td>School of Computing</td><td>Restricted</td></tr>
<tr><td>Information Systems
(formerly Management of Information Technology)</td><td>School of Computing</td><td>Restricted</td></tr>
<tr><td>Multidisciplinary Minors</td><td></td><td></td></tr>
<tr><td>Minor in Data Engineering</td><td>School of Computing and Faculty of Engineering</td><td>Restricted</td></tr>
<tr><td>Interactive Media Development</td><td>Department of Computer Science & Department of Communications and New Media</td><td>Open</td></tr>
</table>

<u>Update 2</u>
</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)		
			Faculty of Engineering		
			Disciplinary Minors		
			Biomedical Engineering (formerly Minor in Bioengineering prior to AY2010/11)	Department of Biomedical Engineering	Restricted
			Civil Infrastructure	Department of Civil and Environmental Engineering	Restricted
			Systems Engineering	Faculty of Engineering	Restricted
			Urban Environmental Engineering	Department of Civil and Environmental Engineering	Open
			Multidisciplinary Minors		
			Minor in Data Engineering	Faculty of Engineering and School of Computing	Restricted
			Engineering Materials (formerly Minor in Materials Science and Engineering; prior to AY2005/06)	Faculty of Engineering and Faculty of Science	Restricted

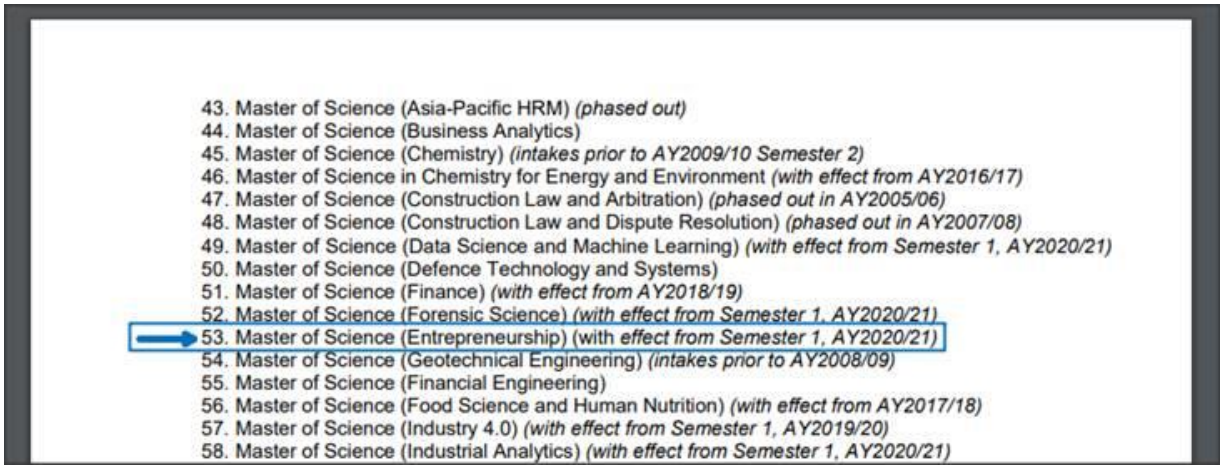
<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Management of Technology</td><td>Faculty of Engineering and
School of Business</td><td>Restricted</td></tr>
<tr><td>Medical Physics</td><td>Department of Biomedical Engineering and Department of Physics</td><td>Restricted</td></tr>
</table>
</td></tr>
<tr><td>56.</td><td>27 Apr 2020

30 Apr 2020</td><td>RO

SCALE</td><td>Update list of self-funded programmes at http://www.nus.edu.sg/registrar/docs/info/administrative-policies-procedures/self-funded-graduate-programmes.pdf by including the following programme that has been converted from MOE-subsidised to elf-financing basis:

(SoC) Master of Computing

No. 53: Master of Science (Entrepreneurship): Change to Master of Science (Venture Creation)

 
</td></tr>
<tr><td>57.</td><td>30 Apr 2020</td><td>RO</td><td>http://www.nus.edu.sg/registrar/academic-information-policies/undergraduate-students/special-programmes/double-major-programmes</td></tr>
</table>

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)

			Please insert the 3 new second majors as indicated in red below:
			
			---------- 	
			
			•
			•
			• Management
			• Mathematics
			• Music-related
			  ○ Audio Arts and Sciences
			  ○ Composition
			  ○ Voice
			  ○ Music and Society
			  ○ Music, Collaboration and Production
			  ○ *Instrumental Performance*:
			  ▪ Bassoon
			  ▪ Cello
			  ▪ Clarinet
			  ▪ Double Bass
			  ▪ Flute
			  ▪ Harp
			  ▪ Horn
			  ▪ Oboe
			  ▪ Percussion
			  ▪ Piano
			  ▪ Trumpet
			  ▪ Trombone
			  ▪ Tuba
			  ▪ Violin
			  ▪ Viola
			• Philosophy
			• Physics
			• Political Science
			• Psychology
			• Public Health
			• Real Estate Finance
			• Social Work

S/N	Date	Faculty/School	(A) Updates Included in NUS Bulletin 2019-20 before archival (i.e., up to 30 Jun 2020)
			• Sociology • Southeast Asian Studies
58.	21 May 2020	RO	Update list of self-funded programmes at http://www.nus.edu.sg/registrar/docs/info/administrative-policies-procedures/self-funded-graduate-programmes.pdf by amending the effective semester for the self-supporting Master of Computing programme from Sem 1, AY2020/21 to Sem 2, AY2020/21

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td>1.</td><td>18 Feb 2021</td><td>FoS</td><td>
<u>FoS: Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

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>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 ~~(an interview is required)~~</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 the application process and more information, please refer to this page.~~

Application
This is an open Minor and is available to undergraduate students from all disciplines, <u>except those who are reading the Bachelor of Environmental Studies (BES) degree from Cohorts AY2016/17 onwards</u>. The
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>declaration to join the Minor should be made by the start of the fifth semester of the undergraduate candidature.

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/</td></tr>
<tr><td>2.</td><td>18 Feb 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular no. and title:
BUS Circular 01 AY20/21 Faculty of Science: Revision to Computational Thinking Requirement for Chemistry, Food Science and Technology, Life Sciences, Pharmaceutical Science and Physics Majors

BUS Circular 24 AY19/20 FoS: Department of Pharmacy – Revision to Computational Thinking Requirement for BSc (Pharmacy)

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

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)	
				Option 3: CS50 Introduction to Computer Science DYOM edX MOOCs
			Chemistry, Food Science & Technology	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
			Pharmacy	For Cohort AY2018/19 and ~~after~~ AY2019/20, to read one of the following as an Unrestricted Elective module: 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
			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	

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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.
3.	23 Feb 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.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 177 of 248 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 *{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 PR4205 Bioorganic Principles of Medicinal Chemistry PR4206 Industrial Pharmacy

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>CN4241R Engineering Principles for Drug Delivery
SP4263 Forensic Toxicology and Poisons</td></tr>
<tr><td>4.</td><td>11 Mar 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_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 and 15 AY20/21

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3.3.3.3 Food Science and Technology

Revised text (additions/changes in red):

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

• FST4199 Honours Project in Food Science & Technology or
FST4299 Applied Project in Food Science & Technology
• FST4102 Advanced Food Processing Technologies
• FST4103 Food Colloids and Components Science</td><td></td></tr>
<tr><td>4000

(32 MCs)</td><td>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
• <s>CM4267 Current Topics in Analytical Techniques</s>
• FST5201 Rheology and Textural Properties of Biomaterials
• FST5202/FST5202A Advanced Food Fermentation/Modern Food Fermentation</td><td>96</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>

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
~~CM5241 Modern Analytical Techniques~~

</td></tr>
<tr><td>5.</td><td>11 May 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_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

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3.3.3.6 Mathematics and Applied Mathematics

Revised text (additions/changes in red):

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</td><td>16</td><td>16</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)			
				• MA1100/MA1100T Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures • MA1101R/MA2001 Linear Algebra I • MA1102R/MA2002 Calculus • CS1010/CS1010E/CS1010S/CS1010X /CS1101S Programming Methodology* * CS1101S (4MCs wef 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	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	24-28	40-44
			3000	Pass three modules from List MA3 Pass two additional modules from LIST III, IV	20-23	60-66
			4000	Pass MA4199 Honours Project in Mathematics Pass three modules from List MA4 Pass two additional modules from List IV	32-33	92-98

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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 • CS4236 Cryptography Theory and Practice • CS5230 Computational Complexity • CS5237 Computational Geometry and Applications

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			• 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 • MA3110/MA3110S/MA3210 Mathematical Analysis II • MA3111/MA3111S/MA3211/MA3211S Complex Analysis I • MA3201 Algebra II • MA3205 Set Theory • MA3209 Metric and Topological Spaces • MA3265 Introduction to Number Theory List MA4 • MA4203 Galois Theory • MA4207 Mathematical Logic • MA4221 Partial Differential Equations • MA4229 Fourier Analysis and Approximation • MA4262 Measure and Integration • MA4271 Differential Geometry of Curves and Surfaces • MA4273 Algebraic Geometry of Curves and Surfaces **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>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<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 Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures
MA1101R/MA2001 Linear Algebra I
MA1102R/MA2002 Calculus
CS1010/CS1010E/CS1010S/CS1010X/CS1101S Programming Methodology</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
Pass one additional module from List II, III, IV</td><td>24-27</td><td>40-43</td></tr>
<tr><td>3000</td><td>3. Pass three modules from List AM3
4. Pass two additional modules from List III, IV</td><td>20-23</td><td>60-66</td></tr>
<tr><td>4000</td><td>5. Pass MA4199 Honours Project in Mathematics
6. Pass four modules from List AM4
7. Pass one additional module from List IV</td><td>32-33</td><td>92-98</td></tr>
<tr><td>UROPS</td><td colspan="3">At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics</td></tr>
</table>
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:
</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<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 Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures
• MA1101R/MA2001 Linear Algebra I
• MA1102R/MA2002 Calculus
• CS1010/CS1010E/CS1010S/CS1010X/CS1101S Programming Methodology</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 three modules from List AM3, of which at least one from List AM3(A)
5. Pass two additional modules from List III, IV</td><td>20-23</td><td>60-66</td></tr>
<tr><td>4000</td><td>6. Pass MA4199 Honours Project in Mathematics
7. Pass four modules from List AM4(A)
8. Pass one additional module from List IV</td><td>32-33</td><td>92-98</td></tr>
<tr><td>UROPS</td><td colspan="3">At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics</td></tr>
</table>

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

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<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 Basic Discrete Mathematics or CS1231/CS1231S Discrete Structures
• MA1101R/MA2001 Linear Algebra I
• MA1102R/MA2002 Calculus
• CS1010/CS1010E/CS1010S/CS1010X/CS1101S Programming Methodology</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 three modules from List AM3, of which at least one from List AM3(B)
5. Pass two additional modules from List III, IV</td><td>20-23</td><td>60-66</td></tr>
<tr><td>4000</td><td>6. Pass MA4199 Honours Project in Mathematics
7. Pass four modules from List AM4(B)
8. Pass one additional module from List IV</td><td>32-33</td><td>92-98</td></tr>
<tr><td>UROPS</td><td colspan="3">At most one Mathematics UROPS module may be used to fulfil the requirements of Major in Applied Mathematics</td></tr>
<tr><th colspan="4">List II</th></tr>
<tr><td colspan="4">• All MA modules at level 2000, except those coded MA23XX
• PC2130 Quantum Mechanics I
• PC2132 Classical Mechanics
• ST2132 Mathematical Statistics
• EC2101 Microeconomic Analysis I</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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 • 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**

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			List AM3 consists of the following 2 baskets AM3(A) and AM3(B). **AM3(A)** • MA3220 Ordinary Differential Equations • MA3227 Numerical Analysis II • MA3233 Combinatorics and Graph II • MA3264 Mathematical Modelling • ST3131 Regression Analysis **AM3(B)** • MA3236 Nonlinear Programming • MA3238/ST3236 Stochastic Processes I • MA3252 Linear and Network Optimization • MA3269 Mathematical Finance I • ST3131 Regression Analysis **List AM4** **List AM4 consists of the following 2 baskets AM4(A) and AM4(B).** **AM4(A)** • MA4229 Fourier Analysis and Approximation • MA4230 Matrix Computation • MA4255 Numerical Methods in Differential Equations • MA4261 Coding and Cryptography • MA4268 Mathematics for Visual Data Processing • MA4270 Data Modelling and Computation **AM4(B)** • MA4235 Topics in Graph Theory • MA4254 Discrete Optimization • MA4260 Stochastic Operations Research • MA4264 Game Theory

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>

MA4269 Mathematical Finance II
QF4103 Mathematical Models of Financial Derivatives
ST4245 Statistical Methods for Finance

</td></tr>
<tr><td>6.</td><td>24 May 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.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.
<s>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.</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>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Page 145 of 248 3.4.2.2 Second Major in Data Analytics **Revised text (additions/changes in red):** This second major is not offered with the following primary majors and minors: Primary Majors: ~~Applied Mathematics,~~ Business Analytics,~~ Computational Biology, Computer Engineering, Computer Science,~~ Data Science and Analytics~~, Industrial and Systems Engineering, Information Security, Mathematics, Quantitative Finance, Statistics,~~ Data Science and Economics. Minors: ~~Financial Mathematics, Mathematics, Statistics.~~ Data Literacy and Analytics Page 166 of 248 3.4.3.5 Minor in Financial Mathematics **Revised text (additions/changes in red):** This minor is <u>not</u> awarded with the primary major in Applied Mathematics, Statistics, Quantitative Finance, Mathematics, Data Science and Analytics, and second major in Mathematics~~, Data Analytics~~. Page 171 of 248 3.4.3.9 Minor in Mathematics **Revised text (additions/changes in red):** This minor is not awarded with the primary major in Mathematics, Applied Mathematics, Quantitative Finance, Data Science and Analytics, and second major in Mathematics ~~or Financial Mathematics or Data Analytics~~. Page 179 of 248

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>3.4.3.14 Minor in Statistics

Revised text (additions/changes in red):

This minor is not awarded with the primary major in Statistics, Statistics with specialisation in Data Science, Statistics with specialisation in Finance and Business Statistics, or Data Science and Analytics, and second major in <s>Data Analytics or</s> Statistics.</td></tr>
<tr><td>7.</td><td>21 Jun 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: SDPPVO/RO: Changes Resulting from Paper ‘SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts’ (RO.169/21(1))

Circular no.: BUS Circular 23 AY20/21

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3.3.3.5 Life Sciences

Revised text (additions/changes in red):

<table>
<tr><th>LEVEL</th><th colspan="2">LIFE SCIENCES MAJOR REQUIREMENTS</th><th>CUMULATIVE MAJOR MCS</th></tr>
<tr><td rowspan="3">Level 4000
(32 MCs)</td><td colspan="2">Pass at least 32MCs via one of the following options:
<u>Honours Research Project</u>
Pass LSM4199 Honours Project in Life Sciences, AND pass another <u>4</u> LSM42xx elective modules. [If one of the three specialisations (BMS/MCB/EVB) is to be pursued, LSM4199 and at least <s>2</s> <u>1</u> of the <u>4</u> LSM42xx have to be completed, all listed with the chosen specialisation.]
<u>Applied Internship Project</u>
Pass LSM4299 Applied Project in Life Sciences, AND pass another 4 LSM42xx elective modules.</td><td rowspan="3">84</td></tr>
<tr><td>LSM4199 Honours Project in Life Sciences
LSM4299 Applied Project in Life Sciences</td><td></td></tr>
<tr><td>LSM4210 Topics in Biomedical Science
LSM4211 Toxicology</td><td></td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)			
				LSM4212 Pharmacogenetics and Drug Responses LSM4213 System Neurobiology LSM4214 Cancer Pharmacology LSM4215 Extreme Physiology LSM4216 Molecular Nutrition ~~Science~~ and Metabolic Biology LSM4217 Functional Ageing LSM4218 Biotechnology and Biotherapeutics LSM4221 Drug Discovery and Clinical Trials LSM4222 Advanced Immunology LSM4223 Advances in Antimicrobial Strategies LSM4224 Free Radicals and Antioxidant Biology LSM4225 Genetic Medicine in the Post-Genomic Era LSM4226 Infection and Immunity LSM4227 Stem Cell Biology LSM4228 Experimental Models for Human Disease and Therapy LSM4229 Therapeutic and diagnostic agents from animal toxins LSM4252 Reproductive Biology	Biomedical Science (BMS)	
				LSM4231 Structural Biology LSM4232 Advanced Cell Biology LSM4234 Mechanobiology LSM4235 Nuclear Mechanics and Genome Regulation LSM4241 Functional Genomics LSM4242 Protein Engineering LSM4243 Tumour Biology LSM4244 Oncogenes and Signal Transduction LSM4245 Advanced Epigenetics and Chromatin Biology LSM4251 Plant Growth and Development	Molecular and Cell Biology (MCB)	

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	LSM4254 Principles of Taxonomy and Systematics LSM4255 Methods in Mathematical Biology LSM4256 Evolution of Development LSM4257 Aquatic Vertebrate Diversity LSM4259 Evolutionary Genetics of Reproduction LSM4260 Plankton Ecology LSM4261 Marine Biology LSM4262 Tropical Conservation Biology LSM4263 Field Studies in Biodiversity LSM4264 Freshwater Biology LSM4265 Urban Ecology LSM4266 Aquatic Invertebrate Diversity LSM4267 Light & Vision in Animal Communications ~~& Sensory Ecology~~ LSM4268 Environmental Bioacoustics	Environmental Biology (EVB)	

3.4.2.4 Second Major in Life Sciences

Revised text (additions/changes in red):

To be awarded a Second Major in Life Sciences, candidates must satisfy the following:

MODULE LEVEL	SECOND MAJOR REQUIREMENTS	CUMULATIVE MAJOR MCS
Level-1000 (16 MCs)	Pass LSM1102/LSM2105 Molecular Genetics LSM1105/LSM2107 Evolutionary Biology LSM1106 Molecular Cell Biology or LSM2106 Fundamental Biochemistry (CM1401 Chemistry for Life Sciences* or CM1501 Organic Chemistry for Engineers or CM2122 Organic Chemistry in Life and Medicine)	16

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	OR (ST1232 Statistics for Life Sciences or ST1131 Introduction to Statistics and Statistical Computing) *If a precluding module to CM1401 (i.e. CM1121 or CM1501) is passed, the precluding module is accepted to be fulfilling the Second Major in Life Sciences in lieu of CM1401.	
Level-2000 (~~16~~ 12 MCs)	Pass LSM2191 Laboratory Techniques in Life Sciences ~~Three~~ Two LSM22xx modules (except LSM2288 and LSM2289)	~~32~~ 28
Level-3000 (~~16~~ 12 MCs)	Pass ~~four~~ three LSM32xx elective modules (except LSM3289), of which up to ~~two~~ one (up to ~~8~~ 4MC) may be LSM42xx (except LSM4299) and/or LSM-recognised elective modules.	~~48~~ 40

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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 ~~12~~ 8 MCs 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

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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) Page 170 of 248 3.4.3.8 Minor in Life Sciences **Revised text (additions/changes in red):** To be awarded a Minor in Life Sciences, a student must pass ~~six~~ five of the following modules: 1. Two modules from the following • LSM1102/LSM2105 Molecular Genetics • LSM1105/LSM2107 Evolutionary Biology • LSM1106 Molecular Cell Biology or LSM2106 Fundamental Biochemistry 2. Two LSM21xx/22xx modules except LSM2288 and LSM2289. 3. Pass ~~two~~ one LSM32xx elective modules (except LSM3288, ~~and~~ LSM3289 and LSM4299)~~, of which one (up to 4MC) may be LSM42xx (except LSM4299) or LSM recognised elective module.~~
8.	21 Jun 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Circular title: FoS: Department of Biological Sciences – Revised Requirements for the Minor in Aquatic Ecology Programme Circular no.: BUS Circular 24 AY20/21 Page 160 of 248 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~~ five 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~~ 1 from the following elective modules: [For students reading Life Sciences Major, please select ~~at least one~~ a non-LSM prefixed module.] GE2103 Our Planet: An Earth Systems Science Perspective GE2215 Introduction to GIS and Remote Sensing 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

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>9.</td><td>21 Jun 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title and no.:
Faculty of Science: Department of Biological Sciences – Proposal for a New Minor Programme in Bioinformatics (Senate Circular 11 AY19/20)

SDPPVO/RO: Changes Resulting from Paper ‘SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts’ (RO.169/21(1)) (BUS Circular 23 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>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>
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 Pharmaceutical Science
3.4.3.13 Minor in Physics
3.4.3.14 Minor in Statistics

Revised text:
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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 Pharmaceutical Science 3.4.3.14 Minor in Physics 3.4.3.15 Minor in Statistics **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 (12 MCs)** CS1010 Programming Methodology (or its variant) LSM2241 Introductory Bioinformatics LSM3241 Genomic Data Analysis **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

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>• ZB3288 Advanced UROPS in Computational Biology I
• ZB4171 Advanced Topics in Bioinformatics

This minor will be open to all majors except Computational Biology.</td></tr>
<tr><td>10.</td><td>21 Jun 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: SDPPVO/RO: Changes Resulting from Paper ‘SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts’ (RO.169/21(1))

Circular no.: BUS Circular 23 AY20/21

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3.3.3.1 Chemistry

Revised text (additions/changes in red):

To be awarded a BSc (Hons) with Specialisation in Chemistry (in either Materials Chemistry, Medicinal Chemistry or Environment and Energy), candidates must satisfy the following:

<table>
<tr><th>LEVEL</th><th>BSC (HONS) IN CHEMISTRY WITH SPECIALISATION
MINIMUM REQUIREMENTS</th><th>CUMULATIVE MCS</th></tr>
<tr><td>1000</td><td>Identical to BSc (Hons) in Chemistry</td><td>24</td></tr>
<tr><td>2000</td><td>Identical to BSc (Hons) in Chemistry</td><td>44</td></tr>
<tr><td>3000</td><td>CM3291 Advanced Experiments in Inorganic and Organic Chemistry
CM3292 Advanced Experiments in Analytical and Physical</td><td>52</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	Chemistry	
3000/4000	1. If CM4199A Honours Project in Chemistry is in area of Specialisation, any seven (7) CM modules (or specified non-CM modules) at Level 3000 or 4000 with at least four (4) such modules at Level 4000[a] and at least ~~four (4)~~ three (3) such modules in area of Specialisation;[b,c] Note: Specialisation Requirement is made up of at least ~~four~~ three modules or ~~16~~ 12 MC from Level 3000 or 4000 CM modules in area of specialization plus 8MC from CM4199A, totaling at least ~~24~~ 20 MC. OR 2. If CM4199A Honours Project in Chemistry is not in area of Specialisation or CM4299 Applied Project in Chemistry is read, any seven (7) CM modules at Level 3000 or 4000 with at least four (4) such modules at Level 4000[a] and at least ~~six (6)~~ five (5) such modules in area of Specialisation[c]; Note: Specialisation requirement is made up of at least ~~six~~ five modules or ~~24~~ 20 MC selected from Level 3000 or 4000 CM modules in area of specialization.	80
4000	CM4199A Honours Project in Chemistry (16 MCs) OR CM4299 Applied Project in Chemistry (16 MCs)	96

[a]Students may take up to one level 5000 module in place of a Level 4000 module
[b]8 MCs of the Honours Project in Chemistry (CM4199A, 16 MCs) could be counted toward Specialisation requirement
[c]Please refer to the Department of Chemistry Student Portal under Primary Major > Chemistry for the list of modules in each area of specialisation

3.4.2.1 Second Major in Chemistry

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>

Revised text (additions/changes in red):

To be awarded a BSc with a second major in Chemistry, 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
CM1111 Inorganic Chemistry 1 or CM1102 Chemistry – The Central Science
CM1121 Organic Chemistry 1 or CM1501 Organic Chemistry for Engineers or CM2122 Organic Chemistry in Life and Medicine
CM1131 Physical Chemistry 1 or CM2133 Foundations of Physical Chemistry
CM1191 Experiments in Chemistry 1 Processes or CM2143 Basic Toolkit of Analytical Chemistry</td><td>16</td></tr>
<tr><td>Level-2000
(~~16~~ 12 MCs)</td><td>~~Pass~~ At least two modules from the following:
• CM2101 Physical Chemistry 2 or CM3131 Applications of Physical Chemistry
• CM2111 Inorganic Chemistry 2 or CM2112 Chemistry of Elements
• CM2121 Organic Chemistry 2 or CM3121 Synthesis of Natural Products and Pharmaceuticals
Pass any one module from the following:
• CM2191 Experiments in Chemistry 2</td><td>~~32~~ 28</td></tr>
</table>

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

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	• CM2192 Experiments in Chemistry 3 • CM3111 Inorganic and Organometallic Chemistry • CM3141 Instrumental Techniques in Analytical Chemistry	
Level-3000 (~~16~~ 12 MCs)	Pass CM3291 Advanced Experiments in Inorganic and Organic Chemistry or CM3292 Advanced Experiments in Analytical and Physical Chemistry or CM3191 Chemical Synthesis Experiments or CM3192 Physical and Analytical Chemistry Experiments AND ~~Three (3)~~ Two (2) other CM32XX modules (excluding CM3289)*	~~48~~ 40

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

3.4.3.1 Minor in Analytical Chemistry

Revised text (additions/changes in red):

To be awarded a minor in Analytical Chemistry, a student must pass all the following ~~six~~ five modules:

1. CM1191 Experiments in Chemistry 1 or CM2143 Basic Toolkit of Analytical Chemistry

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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 or CM1102 Chemistry – The Central Science or CM2122 Organic Chemistry in Life and Medicine or CM2133 Foundations of Physical Chemistry 3. CM2192 Experiments in Chemistry 3 or CM2142 Analytical Chemistry 1 or CM3141 Instrumental Techniques in Analytical Chemistry 4. CM2101 Physical Chemistry 2 or CM3241 Instrumental Analysis I or CM3131 Applications of Physical Chemistry ~~5. CM3242 Instrumental Analysis II~~ ~~6. CM3292 Advanced Experiments in Analytical & Physical Chemistry or CM3295 Selected Experiments in Analytical Chemistry~~ 5. One module from the following: - CM3242 Instrumental Analysis II - CM3292 Advanced Experiments in Analytical & Physical Chemistry - CM3295 Selected Experiments in Analytical Chemistry - CM3192 Physical and Analytical Chemistry Experiments
11.	21 Jun 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf Circular title: SDPPVO/RO: Changes Resulting from Paper 'SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts' (RO.169/21(1)) Circular no.: BUS Circular 23 AY20/21 Page 146 of 248 3.4.2.3 Second Major in Food Science **Revised text (additions/changes in red):** To be awarded a B.Sc. with a Second Major in Food Science, candidates must satisfy the following:

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

MODULE LEVEL	SECOND MAJOR REQUIREMENTS	CUMULATIVE MAJOR MCS
Level 1000 (16 MCs)	Pass FST1101 Science and Technology of Foods or FST1101B Science and Technology of Foods CM1501 Organic Chemistry for Engineers or CM2122 Organic Chemistry in Life and Medicine CM1191 Experiments in Chemistry 1 or CM2143 Basic Toolkit of Analytical Chemistry LSM1106 Molecular Cell Biology or LSM2106 Fundamental Biochemistry	16 MCs
Level 2000 (~~16~~ 12 MCs)	Pass FST2102B Chemistry of Food Components FST2108 Food Safety Assurance or FST3108 Food Safety and Regulation Pass one module from the following: FST2201 Introduction to Human Nutrition LSM2211/LSM3210 Metabolism and Regulation	~~32~~ 28 MCs
Level 3000 (~~16~~ 12 MCs)	Pass FST3106 Sensory and Flavour Science FST3202 Nutrition and Disease Prevention	~~48~~ 40 MCs

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>~~Any two~~ Select one of the following:

CM3242 Instrumental Analysis II

CM3201 Principles of Chemical Processes

CM3291 Advanced Experiments in Inorganic and Organic Chemistry
CM3292 Advanced Experiments in Analytical and Physical Chemistry

CM3191 Chemical Synthesis Experiments
CM3192 Physical and Analytical Chemistry Experiments</td><td></td></tr>
</table>
</td></tr>
<tr><td>12.</td><td>21 Jun 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>

Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title and no.:
FoS: Mathematics – Proposal for Changes to Requirements of the Second Major in Mathematics (BUS Circular 26 AY19/20)

SDPPVO/RO: Changes Resulting from Paper ‘SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts’ (RO.169/21(1)) (BUS Circular 23 AY20/21)

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3.4.2.5 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~~ 40 MCs from non-overlapping modules of the following:</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th colspan="3">(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td colspan="3">
<table>
<tr><th>Module Level</th><th>2nd Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000
(12-14 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</td><td>12-14</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				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~~	
			Level-2000 (~~20-23~~ 16-18 MCs)	Pass MA2101/ Linear Algebra II MA2101S MA2108/ Mathematical Analysis I MA2108S MA2216/MA2116/ST2131 Probability or ST2334 Probability and Statistics ~~One additional module from List II, III, IV~~	~~32-37~~ 28-32
			Level-3000 & Level 4000	Pass	~~48-52~~ 40-47

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

(~~16-18~~ 12-15 MCs)	~~Four~~ Three modules from List III, IV, where at least two are MA-coded	

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
- 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 Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			• PC4248 Relativity • PC4274 Mathematical Methods in Physics III • PC5274 Advanced Mathematical Methods in Physics • ST4238 Stochastic Processes II • ST4245 Statistical Methods for Finance **----------** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: SDPPVO/RO: Changes Resulting from Paper 'SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts' (RO.169/21(1)) Circular no.: BUS Circular 23 AY20/21 Page 104 of 200 3.4.3.9 Minor in Mathematics **Revised text (additions/changes in red):** To qualify for a Minor in Mathematics, a student should pass at least ~~24~~ 20 MCs from non-overlapping modules of the following type: 1. At least 8 MCs from the following modules: o MA1xxx/MA20xx modules except MA1301/MA1301X, OR o CS1231/CS1231S; and 2. Any two MA2xxx modules (except MA20xx); and 3. Any ~~two~~ one MA3xxx or higher modules, except those coded MA33XX. Note that these ST and MA modules are cross-listed: • ST2131 with MA2216 • ST3236 with MA3238 • ST4238 with MA4251 ----------

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Link: https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: SDPPVO/RO: Changes Resulting from Paper 'SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts' (RO.169/21(1)) Circular no.: BUS Circular 23 AY20/21 Page 103 of 200 3.4.3.5 Minor in Financial Mathematics **Revised text (additions/changes in red):** To be awarded a minor in Financial Mathematics, a student must pass at least ~~24~~ 20 MCs from non-overlapping modules of the following: 1. Pass at least 8 MCs from the following modules: a. MA1xxx/MA20xx, except MA1301/MA1301X; b. CS1231/CS1231S; and 2. Pass MA2216/MA2116/ST2131 or ST2334; and 3. Pass MA3269 or QF2104 4. Pass QF3101 [for non-BIZ students] 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/MA2116/ST2131 Probability MA3269 Mathematical Finance I QF2104 Fundamentals of Quantitative Finance QF3101 Investment Instruments: Theory and Computation/Investment Instrument and Risk Management 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

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
13.	21 Jun 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: SDPPVO/RO: Changes Resulting from Paper 'SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts' (RO.169/21(1)) Circular no.: BUS Circular 23 AY20/21 Page 186 of 200 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 {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~~ Any four from the following elective modules (at least one at Level 3000 and above): PR1301 Complementary Medicine and Health 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 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

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>~~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>14.</td><td>21 Jun 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: SDPPVO/RO: Changes Resulting from Paper ‘SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts’ (RO.169/21(1))

Circular no.: BUS Circular 23 AY20/21

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3.3.3.8 Physics

Revised text (additions/changes in red):

To be awarded a specialisation in Astrophysics, 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><th>~~MODULE LEVEL~~</th><th>~~SPECIALISATION REQUIREMENTS~~</th><th>~~CUMULATIVE MAJOR MCS~~</th></tr>
<tr><td>~~Level-3000~~</td><td>~~Pass:~~
~~PC3246 Astrophysics I~~</td><td>~~4~~</td></tr>
<tr><td>~~Level-4000~~</td><td>~~Pass:~~</td><td>~~24~~</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	~~PC4248 Relativity~~ ~~PC4249 Astrophysics II~~ ~~PC4199 Honours Project in Physics (Astrophysics)**~~	

MODULE LEVEL	SPECIALISATION REQUIREMENTS	CUMULATIVE MAJOR MCS
Level-3000 and 4000	Pass: PC4199 Honours Project in Physics (Astrophysics)** Pass two from the following: PC3246 Astrophysics I PC4248 Relativity PC4249 Astrophysics II	20

To be awarded a specialisation in Nanophysics, candidates must read and pass the following modules, as part of the major requirements for B.Sc. (Hons.) with a primary major in Physics.

MODULE LEVEL	SPECIALISATION REQUIREMENTS	CUMULATIVE MAJOR MCS

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>Level-3000
And
Level-4000</td><td>Pass any ~~24~~ 20 MCs from the following:
PC3235 Solid State Physics I
PC3241 Solid State Devices
PC3242 Nanofabrication and Nanocharacterization
PC3243 Photonics
PC4246 Quantum Optics
PC4253 Thin Film Technology
PC4199 Honours Project in Physics (Nanophysics)**</td><td>~~24~~ 20</td></tr>
</table>
** Honours Project has to be in the area of specialisation

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><th>MODULE LEVEL</th><th>SPECIALISATION REQUIREMENTS</th><th>CUMULATIVE MAJOR MCS</th></tr>
<tr><td>Level-3000 and
Level-4000</td><td>Pass:
PC4228 Device physics for quantum technology
PC4199 Honours Project in Physics (**)
Pass any ~~8~~ 4 MC from the following:
PC3233 Atomic and Molecular Physics I
PC3288 Advanced UROPS in Physics I (**)
PC4230 Quantum Mechanics III</td><td>~~24~~ 20</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	PC4243 Atomic and Molecular Physics II PC4246 Quantum Optics	

** UROPS and Honours Project have to be in the area of specialisation

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3.4.2.6 Second Major in Physics

Revised text (additions/changes in red):

To be awarded a second major in Physics, candidates must satisfy the following:

MODULE LEVEL	SECOND MAJOR REQUIREMENTS	CUMULATIVE MAJOR MCS
Level-1000 (16 MCs)	Pass PC1141 Introduction to Classical Mechanics or PC1431 Physics IE PC1142 Introduction to Thermodynamics and Optics or PC1431 Physics IE PC1143 Introduction to Electricity & Magnetism or PC1432 Physics IIE PC1144 Introduction to Modern Physics or PC1432 Physics IIE *Note: if a student has not read both PC1141 and PC1142, they will have to read PC1431 and PC31xx/PC32xx/PC42xx (excluding PC4288 and its variants). Likewise, if a student has not read both PC1143 and PC1144, they will have to read PC1432 and PC31xx/PC32xx/PC42xx (excluding PC4288 and its variants).*	16

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
			Level-2000 (~~16~~ 12 MCs)	~~Pass~~ ~~PC2130 Quantum Mechanics I~~ ~~PC2131 Electricity and Magnetism I~~ ~~PC2193 Experimental Physics I~~ ~~Any one from the following:~~ ~~• PC2132 Classical Mechanics~~ ~~• PC2134 Mathematical Methods in Physics I~~ ~~• PC2230 Thermodynamics and Statistical Mechanics~~ Any three from the following: • PC2130 Quantum Mechanics I • PC2131 Electricity and Magnetism I • PC2193 Experimental Physics I • PC2132 Classical Mechanics • PC2134 Mathematical Methods in Physics I or PC3274A Mathematical Methods in Physics II • PC2230/PC2135 Thermodynamics and Statistical Mechanics	~~32~~ 28
			Level-3000 (~~16~~ 12 MCs)	Pass Any ~~four~~ three from the following • PC3130 Quantum Mechanics II • PC3193 Experimental Physics II	~~48~~ 40

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	• ALL PC32XX and PC42XX modules that can be used to fulfil the requirements for the Major Programme in Physics.	

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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

7. Read and pass the following three essential modules:
    a. PC2267 Biophysics I
    b. PC3267 Biophysics II
    c. LSM3243 Molecular Biophysics
8. Read and pass ~~three~~ two 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 or CM1102 Chemistry – The Central Science
    d. PC2131 Electricity & Magnetism
    e. PC2230/PC2135 Thermodynamics & Statistical Mechanics
    f. LSM2102 Molecular Biology or LSM2232/LSM3220 ~~Genes and Genomes~~ Genes, Genomes and Biomedical Implications
    g. LSM2241 Introductory Bioinformatics
    h. PC4267 Biophysics III
    i. PC4268 Biophysical Instrumentation and Biomolecular Electronics

For students undertaking a major in Physics

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~~ two modules from the following ~~(Maximum of two Level-1000 modules)~~:

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			a. LSM1101 Biochemistry of Biomolecules or LSM1106 Molecular Cell Biology or LSM2106 Fundamental Biochemistry b. LSM1102/LSM2105 Molecular Genetics c. CM1131 Physical Chemistry 1 or CM2133 Foundations of Physical Chemistry d. PC2131 Electricity & Magnetism e. PC2230/PC2135 Thermodynamics & Statistical Mechanics f. LSM2102 Molecular Biology or LSM2232/LSM3220 ~~Genes and Genomes~~ 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~~ two 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 or LSM2106 Fundamental Biochemistry d. LSM1102/LSM2105 Molecular Genetics e. CM1131 Physical Chemistry 1 or CM2133 Foundations of Physical Chemistry f. PC2131 Electricity & Magnetism g. PC2230/PC2135 Thermodynamics & Statistical Mechanics h. LSM2102 Molecular Biology or LSM2232/LSM3220 ~~Genes and Genomes~~ Genes, Genomes and Biomedical Implications i. LSM2241 Introductory Bioinformatics j. PC4267 Biophysics III k. PC4268 Biophysical Instrumentation and Biomolecular Electronics 3.4.3.10 Minor in Medical Physics

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Revised text (additions/changes in red): Students in the Medical Physics minor programme are also required to read at least 12 MCs of modules from the following set of electives: 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. 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~~ 8 MCs of modules from the following set of electives: <u>Module (4 MC each)</u> 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 10. LSM2106 Fundamental Biochemistry 3.4.3.11 Minor in Nanoscience **Revised text (additions/changes in red):** To qualify for a Minor in Nanoscience, a student should pass ~~six~~ five modules as follows: 1. Two compulsory Level-1000 modules:

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			a. CM1131 Physical Chemistry or CM1502/CM1502X General and Physical Chemistry for Engineers or CM1102 Chemistry – The Central Science and b. PC1144 Introduction to Modern Physics or PC1432/PC1432X Physics IIE 2. Two Level-2000 modules: a. SP2251 Science at the Nanoscale and b. CM2101 Physical Chemistry 2 or CM2133 Foundations of Physical Chemistry or PC2130 Quantum Mechanics 1 3. ~~Two~~ One Level-3000 modules: a. CM3251 Nanochemistry; or b. PC3251 Nanophysics; or c. CM/LSM/ [Advanced UROPS]* PC3288 d. SP3277 Nano: from Research Bench to Industrial Applications** * Must be a Nanoscience-related project. ** SP3277 involves a compulsory nanotechnology study tour to Japan ~~Note: Chemistry and Physics majors are only allowed to read at most three CM- and three PC- coded modules respectively; out of which only two modules (at most) are allowed to overlap with a student's major requirements.~~ Note: Chemistry and Physics majors who have read three CM- and three PC- coded modules respectively can only double count at most two modules with their major requirements. Page 178 of 248 3.4.3.13 Minor in Physics **Revised text (additions/changes in red):** To be awarded a minor in Physics, a student must pass the following ~~six~~ five modules: 1. Any one from the following:

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			• PC1141 Introduction to Classical Mechanics • PC1142 Introduction to Thermodynamics and Optics • PC1143 Introduction to Electricity & Magnetism • 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~~ three modules from the following of which at least ~~two~~ one module~~s~~ must be Level-3000 & above: • PC2130 Quantum Mechanics I • PC2131 Electricity and Magnetism I • PC2132 Classical Mechanics • PC2134 Mathematical Methods in Physics I or PC3274A Mathematical Methods in Physics II • PC2230/PC2135 Thermodynamics and Statistical Mechanics • PC2193 Experimental Physics I • PC3130 Quantum Mechanics II • PC3193 Experimental Physics II • ALL PC32XX and PC42XX modules
15.	21 Jun 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf Circular title: SDPPVO/RO: Changes Resulting from Paper 'SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts' (RO.169/21(1)) Circular no.: BUS Circular 23 AY20/21 Page 128 of 248 3.3.3.10 Statistics **Revised text (additions/changes in red):** Honours students majoring in Statistics have the option to qualify for specialisation in

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			1. Data Science or 2. Finance and Business Statistics. (A) To be awarded a specialisation in Data Science, a candidate must pass at least ~~six~~ five modules (~~24~~ 20 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/ST4250 Multivariate Statistical Analysis CS3243 Introduction to Artificial Intelligence* 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* DSE4211/QF4211 Digital Currencies* DSE4212/QF4212 Data Science in FinTech* *Modules with hidden pre-requisites (indicated in brackets): • CS3210 (CS2100 Computer Organisation) • CS3243 (CS1232 Discrete Structures and CS2040 Data Structures and Algorithms) • CS3244 (CS2040 Data Structures and Algorithms) • CS4231 (CS3230 Design and Analysis of Algorithms or CS3210 Parallel Computing) • MA4268 (MA2213 Numerical Analysis I) • DSE4211/QF4211 (QF2104 Fundamentals of Quantitative Finance or DSA2102 Essential Data Analytics Tools: Numerical Computation) • DSE4212/QF4212 (same as DSE4211/QF4211)

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			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~~ five modules (~~24~~ 20 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/ST4253 Applied Times Series Analysis ST3234 Actuarial Statistics ST3246 Statistical Models for Actuarial Science MA3269 Mathematical Finance I ST4245 Statistical Methods for Finance MA4269 Mathematical Finance II or QF4103 Mathematical Models of Financial Derivatives* DSE4211/QF4211 Digital Currencies* DSE4212/QF4212 Data Science in FinTech* **FBS 2** ST3232 Design and Analysis of Experiments ST3239 Survey Methodology ST3242 Introduction to Survival Analysis or ST4252 Applied Survival Analysis ST3244 Demographic Methods ST4238 Stochastic Processes II * Modules with hidden pre-requisites (indicated in brackets): • QF4103 (QF2104 Fundamentals of Quantitative Finance) • DSE4211/QF4211 (QF2104 Fundamentals of Quantitative Finance or DSA2102 Essential Data Analytics Tools: Numerical Computation) • DSE4212/QF4212 (same as DSE4211/QF4211) 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.

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
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3.4.2.7 Second Major in Statistics

Revised text (additions/changes in red):

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 MCs)</td><td>Pass

ST1131 Introduction to Statistics/Introduction to Statistics and Statistical Computing
or
ST1232 Statistics for Life Sciences

MA1101R/MA2001 Linear Algebra I
or
MA1508E Linear Algebra for Engineering
or
MA1513 Linear Algebra with Differential Equations (2 MCs) ^

MA1102R/MA2002 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</td><td>14 - 16</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				CS1010 Programming Methodology or CS1010E Programming Methodology or CS1010J Programming Methodology or CS1010S Programming Methodology or CS1010X Programming Methodology or IT1007 Introduction to Programming with Python and C	
			Level-2000 (~~16~~ ~~17~~ 16 MCs)	Pass ST2131/ MA2216/MA2116 Probability or ST2334 Probability and Statistics ST2132 Mathematical Statistics ST2137 Computer Aided Data Analysis/Statistical Computing and Programming MA2311 Techniques in Advanced Calculus or MA2104 Multivarible Calculus or MA2108 Mathematical Analysis I or MA2108S Mathematical Analysis I (S)	~~30~~ ~~33~~ 30-32

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

Level-3000 & Level-4000 (~~16-20~~ 8-12 MCs)	Pass ~~ST3131 Regression Analysis*~~ – ~~Three~~ Two other modules from ST3131 or ST32xx (except ST328x) or ~~ST4xxx~~ ST42xx (except ST4288) modules – One additional module from ST32xx (except ST328x) or ~~ST4xxx~~ ST42xx (except ST4288) modules ^	~~48-51~~ 40-42

~~* Students who have passed EC3303 Econometrics I need not read ST3131. They are allowed to read and pass an additional module from ST32xx (except ST328x) or ST4xxx modules in lieu of ST3131. However, where a module from ST32xx or ST4xxx modules requires ST3131 as pre-requisite, the pre-requisite may not be fulfilled by EC3303.~~

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

3.4.3.14 Minor in Statistics

Revised text (additions/changes in red):

To be awarded this minor, students must:

1. Pass one of the following:
   a. MA1102R/MA2002 Calculus
   b. MA1312 Calculus with Applications
   c. MA1507 Advanced Calculus
   d. MA1505 Mathematics I
   e. MA1511 Engineering Calculus (2 MCs) and MA1512 Differential Equations for Engineering (2 MCs)
   f. MA1521 Calculus for Computing
2. Pass ST2131/MA2216/MA2116 Probability or ST2334 Probability and Statistics;
3. Pass ST2132 Mathematical Statistics or ST2137 Computer Aided Data Analysis/Statistical Computing and Programming ~~and ST3131 Regression Analysis*~~; and

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>4. Pass one module from ST3131 Regression Analysis or ST32xx (except ST328x), and one other module from ST32xx (except ST328x)/~~ST4xxx~~ ST42xx (except ST4288), EC3304 Econometrics II, EC4303 Econometrics III, IE3101 Statistics for Engineering Applications, DBA3711 Stochastic Models in Management, FIN3712 Options and Future, FIN3715 Risk and Insurance, MA3259 Mathematical Methods in Genomics and LSM3241 Genomic Data Analysis.

~~* Students who have passed EC3303 Econometrics I need not read ST3131. They are allowed to read and pass an additional module from ST32xx (except ST328x) or ST4xxx modules in lieu of ST3131. However, where a module from ST32xx or ST4xxx modules requires ST3131 as pre-requisite, the pre-requisite may not be fulfilled by EC3303.~~</td></tr>
<tr><td>16.</td><td>21 Jun 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: SDPPVO/RO: Changes Resulting from Paper ‘SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts’ (RO.169/21(1))

Circular no.: BUS Circular 23 AY20/21

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3.4.2.2 Second Major in Data Analytics

Revised text (additions/changes in red):

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 (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
+ DSA1101 Introduction to Data Science
- One of the following modules:
+ MA1101R/MA2001 Linear Algebra I</td><td>10 – 12</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				+ MA1311 Matrix Algebra + MA1508E Linear Algebra for Engineering + MA1513 Linear Algebra with Differential Equations (2 MCs) ‡ - One of the following modules: + MA1102R/MA2002 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	
			Level 2000 (16 MCs)	Pass - CS2040 Data Structures and Algorithms - ST2131/MA2216/MA2116 Probability - ST2132 Mathematical Statistics - One of the following modules: + DSA2101 Essential Data Analytics Tools: Data Visualisation + DSA2102 Essential Data Analytics Tools: Numerical Computation	26 – 28
			Level 3000 and 4000 (~~20-24~~ 12-16 MCs)	Pass ~~- ST3131 Regression Analysis*~~ - One of the following modules: + DSA3102 Essential Data Analytics Tools: Convex Optimisation* + 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 ‡~~ - Two (or three^) of the following modules: + CS3244 Machine Learning + ST3131 Regression Analysis † + DSA4211 High-Dimensional Statistical Analysis † + DSA4212 Optimisation for Large-Scale Data-Driven Inference* + ST3240/ST4250 Multivariate Statistical Analysis † + ST3247 Simulation + ST3248 Statistical Learning I + ST4248 Statistical Learning II †	40 – 42

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			~~* Students who passed EC3303 Econometrics I need not read ST3131. They are allowed to read and pass an additional module from List I or List II in lieu of ST3131. However, where a module in List I or Lit II requires ST3131 as pre-requisite, the pre-requisite may not be fulfilled by EC3303.~~ ^ Applicable only to students who use MA1513 Linear Algebra with Differential Equations (2 MCs) to fulfil the second major requirements. * Students may need to read additional modules outside the second major requirements to satisfy the pre-requisites of this module. † Students who have passed EC3303 Econometrics I are precluded from reading ST3131. For modules in this second major that require ST3131 as a pre-requisite, i.e., DSA4211, ST3240/ST4250 and ST4248, the pre-requisite may not be fulfilled by EC3303.
17.	29 Jun 2021	FoS	**Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: SDPPVO/RO: Changes Resulting from Paper 'SDPPVO: Extension of Revised Second Major, Minor and Specialisation Requirements to AY2019/20 & AY2020/21 Cohorts' (RO.169/21(1)) Circular no.: BUS Circular 23 AY20/21 Page 103 of 200 3.4.3.5 Minor in Financial Mathematics **Revised text (additions/changes in red):** To be awarded a minor in Financial Mathematics, a student must pass at least ~~24~~ 20 MCs from non-overlapping modules of the following: 1. Pass at least 8 MCs from the following modules: a. MA1xxx/MA20xx, except MA1301/MA1301X; b. CS1231/CS1231S; and 2. Pass MA2216/MA2116/ST2131 or ST2334; and 3. Pass MA3269 or QF2104 4. Pass QF3101 [for non-BIZ students] ~~or FIN3101 [for BIZ students]~~ or FIN3102/FIN3702* [for BIZ students])~~;~~ ~~and ST3131.~~

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			The titles of the above modules are as listed below: CS1231/CS1231S Discrete Structures MA2216/MA2116/ST2131 Probability MA3269 Mathematical Finance I QF2104 Fundamentals of Quantitative Finance QF3101 Investment Instruments: Theory and Computation/Investment Instrument and Risk Management 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
18.	15 Jul 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular no. and title: BUS Circular 22 AY18/19 FASS: An Update on Computational Thinking Requirements in the FASS Undergraduate Curriculum BUS Circular 26 AY20/21 FoS: Pharmacy - Change in Bachelor of Pharmacy Programme Requirements Page 184 of 241 3.3.1.7 Computational Thinking Requirement **Revised text (additions/changes in red):**

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)	
			MAJORS	**OPTIONS TO FULFIL COMPUTATIONAL THINKING REQUIREMENT**
			Life Sciences, **Pharmaceutical Science,** **Physics**	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
			Chemistry, **Food Science & Technology**	Option 1: COS2000 – Computational Thinking for Scientists or Option 2: CM3267 – Computational Thinking and Programming in Chemistry* or

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				Option 3: CS1010S (or its variants) – Programming Methodology or CS1101S Programming Methodology or Option 4: CS50 Introduction to Computer Science DYOM edX MOOCs	
			Pharmacy	For Cohort AY2018/19 to AY2020/21, to read one of the following as an Unrestricted Elective module: 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	
			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 GET1050 Computational Reasoning. Students may choose to take the modules below as an alternative to fulfil the CT requirement: • NM2207 Computational Media Literacy • ~~PH2213~~ PH2113 Computation and Philosophy	

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>
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 GET1050 as the RC4 programme encourages explicit use of representing thinking, using computer models.
</td></tr>
</table>
</td></tr>
<tr><td>19.</td><td>15 Jul 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

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

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

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<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>
<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.
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			^SP1541 is meant for student Cohort 2015 and after.
20.	16 Aug 2021	FoS	**Updates for Bulletin AY19/20** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: FoS: Department of Biological Sciences – Removal of FSC52xx from the Requirements of the Minor Programme in Forensic Science Circular no.: BUS Circular 1 AY21/22 Page 202 of 247 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 8MCs 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.]

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>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)</td></tr>
<tr><td>21.</td><td>27 Aug 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: FoS: Statistics and Data Science — Proposed Changes to the Statistics Second Major Requirements for Cohorts AY2019/2020 and AY2020/2021

Circular no.: BUS Circular 2 AY21/22

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3.4.2.7 Second Major in Statistics

Revised text (additions/changes in red):

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 MCs)</td><td>Pass

ST1131 Introduction to Statistics/Introduction to Statistics and Statistical Computing</td><td>14 - 16</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				or ST1232 Statistics for Life Sciences MA1101R/MA2001 Linear Algebra I or MA1508E Linear Algebra for Engineering or MA1513 Linear Algebra with Differential Equations (2 MCs) ^ MA1102R/MA2002 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/CS1010E/CS1010J/CS1010S/CS1010X/CS1101S Programming Methodology or IT1007 Introduction to Programming with Python and C	
			Level-2000 (~~16~~ 12 MCs)	Pass ST2131/MA2216/MA2116 Probability or ST2334 Probability and Statistics ST2132 Mathematical Statistics ST2137 Computer Aided Data Analysis/Statistical Computing and Programming	~~30-32~~ 26-28

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>~~MA2311 Techniques in Advanced Calculus~~
~~or~~
~~MA2104 Multivarible Calculus~~
~~or~~
~~MA2108 Mathematical Analysis I~~
~~or~~
~~MA2108S Mathematical Analysis I (S)~~</td><td></td></tr>
<tr><td>Level-3000 & Level-4000
(~~8~~ ~~12~~ 12-16 MCs)</td><td>Pass
– ~~Two~~ Three modules from ST3131 or ST32xx (except ST328x) or ST42xx (except ST4288) modules
– One additional module from ST32xx (except ST328x) or ST42xx (except ST4288) modules ^</td><td>40-42</td></tr>
</table>
^ Applicable only to students who use MA1513 Linear Algebra with Differential Equations (2 MCs) to fulfil the second major requirements.
</td></tr>
<tr><td>22.</td><td>9 Sep 2021</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.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

Page 225 of 251</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
3.4.2.6 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 or PC1431 Physics IE

PC1142 Introduction to Thermodynamics and Optics or PC1431 Physics IE

PC1143 Introduction to Electricity & Magnetism or PC1432 Physics IIE

PC1144 Introduction to Modern Physics or PC1432 Physics IIE

Note: if a student has not read both PC1141 and PC1142, they will have to read PC1431 and PC31xx/PC32xx/PC42xx (excluding PC4288 and its variants). Likewise, if a student has not read both PC1143 and PC1144, they will have to read PC1432 and PC31xx/PC32xx/PC42xx (excluding PC4288 and its variants).</td><td>16</td></tr>
<tr><td>Level-2000

(12 MCs)</td><td>Any <u>three</u> from the following:

• PC2130 Quantum Mechanics I

• PC2131/PC2031 Electricity and Magnetism I

• PC2193 Experimental Physics I

• PC2132 Classical Mechanics or PC2032 Classical Mechanics I</td><td>28</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)

	• PC2134 Mathematical Methods in Physics I or PC3274A Mathematical Methods in Physics II • PC2230/PC2135 Thermodynamics and Statistical Mechanics	
Level-3000 (12 MCs)	Pass Any <u>three</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.	40

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:

<u>For students undertaking a major in Life Sciences</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 two modules from the following:
    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 or CM1102 Chemistry – The Central Science

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			d. PC2131/PC2031 Electricity & Magnetism e. PC2230/PC2135 Thermodynamics & Statistical Mechanics f. LSM2102 Molecular Biology or LSM2232/LSM3220 Genes, Genomes and Biomedical Implications g. LSM2241 Introductory Bioinformatics 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: a. PC2267 Biophysics I b. PC3267 Biophysics II c. LSM3243 Molecular Biophysics 2. Read and pass two modules from the following: a. LSM1101 Biochemistry of Biomolecules or LSM1106 Molecular Cell Biology or LSM2106 Fundamental Biochemistry b. LSM1102/LSM2105 Molecular Genetics c. CM1131 Physical Chemistry 1 or CM2133 Foundations of Physical Chemistry d. PC2131/PC2031 Electricity & Magnetism e. PC2230/PC2135 Thermodynamics & Statistical Mechanics f. LSM2102 Molecular Biology or LSM2232/LSM3220 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 two modules from the following: 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 or LSM2106 Fundamental Biochemistry d. LSM1102/LSM2105 Molecular Genetics

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			e. CM1131 Physical Chemistry 1 or CM2133 Foundations of Physical Chemistry f. PC2131/PC2031 Electricity & Magnetism g. PC2230/PC2135 Thermodynamics & Statistical Mechanics h. LSM2102 Molecular Biology or LSM2232/LSM3220 Genes, Genomes and Biomedical Implications i. LSM2241 Introductory Bioinformatics j. PC4267 Biophysics III k. PC4268 Biophysical Instrumentation and Biomolecular Electronics Page 231 of 251 3.4.3.13 Minor in Physics **Revised text (additions/changes in red):** To be awarded a minor in Physics, a student must pass the following five modules: 1. Any one 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 2. Any one from the following: • PC1144 Introduction to Modern Physics • PC1432/PC1432X Physics IIE • PC2232 Physics for Electrical Engineers 3. Any three modules from the following of which at least one module 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 or PC3274A Mathematical Methods in Physics II • PC2230/PC2135 Thermodynamics and Statistical Mechanics • PC2193 Experimental Physics I • PC3130 Quantum Mechanics II • PC3193 Experimental Physics II • ALL PC32XX and PC42XX modules

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td>23.</td><td>21 Oct 2021</td><td>FoS</td><td>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: FoS – Proposed New Minor Programme in Data Analytics

Circular No.: Senate Circular 1 AY2021/22

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A new row is to be inserted in the table
<table>
<tr><th>MINOR</th><th>PREREQUISITES</th></tr>
<tr><td>Data Analytics</td><td>Open to students from all disciplines except those who are reading the Majors in Business Analytics, Data Science and Analytics, Data Science and Economics, and Second Majors in Business Analytics and Data Analytics.</td></tr>
</table>

<u>A new title is inserted in 3.4.3 Minor Programmes</u>
To change the numbering as it is in alpha order, insert in 3.4.3.5 Minor in Data Analytics

Current 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 Pharmaceutical Science
3.4.3.14 Minor in Physics
3.4.3.15 Minor in Statistics

Revised text:
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			3.4.3.3 Minor in Bioinformatics 3.4.3.4 Minor in Biophysics 3.4.3.5 Minor in Data Analytics 3.4.3.6 Minor in Engineering Materials 3.4.3.7 Minor in Financial Mathematics 3.4.3.8 Minor in Forensic Science 3.4.3.9 Minor in Geosciences 3.4.3.10 Minor in Life Sciences 3.4.3.11 Minor in Mathematics 3.4.3.12 Minor in Medical Physics 3.4.3.13 Minor in Nanoscience 3.4.3.14 Minor in Pharmaceutical Science 3.4.3.15 Minor in Physics 3.4.3.16 Minor in Statistics **A new page is inserted for 3.4.3.5 Minor in Data Analytics** Host Department: Department of Mathematics and Department of Statistics and Data Science In the face of an exponential growth in consumable data, businesses increasingly recognise that augmenting the capabilities of the whole workforce—rather than one relatively small team of data specialists—to derive meaningful information from data can significantly increase the business opportunity of data. This ability to derive meaningful information from reading, understanding, questioning and working with data is broadly referred to as data literacy. The minor provides NUS undergraduate students with the opportunity to equip themselves with the frameworks and methodologies that will enable them to own the data process, from data gathering and analysis to generating insights and value. Graduates who have completed the minor will be ready to embrace a culture of data-driven decisions and be able to use data confidently and effectively as business users in their workplace. This minor will be open to all except for those reading the Majors in Business Analytics, Data Science and Analytics, Data Science and Economics, and Second Majors in Business Analytics and Data Analytics. To be awarded a Minor in Data Analytics, a student must complete 20 MCs of the following modules: 1) GEA1000 Quantitative Reasoning with Data *or*

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			GER1000 Quantitative Reasoning* *or* DSA1101 Introduction to Data Science *or* DSE1101 Introductory Data Science for Economics* *or* ST1131 Introduction to Statistics and Statistical Computing 2) MA2401 Introductory Mathematics with R^ 3) DSA2101 Essential Data Analytics Tools: Data Visualisation 4) DSA3361 Inferential Data Analytics 5) DSA3362 Predictive Data Analytics *or* DSA3102 Essential Data Analytics Tools: Convex Optimisation *or* DBA3701 Introduction to Optimisation * GER1000 will be discontinued after AY2020/2021 and DSE1101 is offered only to students in the Data Science and Economics XDP. ^ Students reading the Minor in Data Analytics may replace MA2401 by three modules, with one module in each of the areas of calculus, linear algebra and probability, as follows: <u>Calculus</u> MA1102R/MA2002 Calculus MA1312 Calculus with Applications MA1505 Mathematics I MA1507 Advanced Calculus MA1511 Engineering Calculus MA1521 Calculus for Computing <u>Linear algebra</u> MA1101R/MA2001 Linear Algebra I MA1311 Matrix Algebra MA1508E Linear Algebra for Engineering MA1513 Linear Algebra with Differential Equations <u>Probability</u> MA2216/MA2116/ST2131 Probability ST2334 Probability and Statistics

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td>24.</td><td>2 Dec 2021</td><td>FoS</td><td>
<u>Updates for Bulletin AY19/20</u>
Link: https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.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

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 colspan="2">(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td colspan="2"><table>
<tr><td></td><td>or

Option 4: CS50 Introduction to Computer Science DYOM edX MOOCs</td></tr>
<tr><td>Pharmacy</td><td>For Cohort AY2018/19 to AY2020/21, to read one of the following as an Unrestricted Elective module:
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>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 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 GET1050 as the RC4 programme encourages explicit use of representing thinking, using computer models.</td></tr>
</table></td></tr>
<tr><td>25.</td><td>2 Dec 2021</td><td>FoS</td><td colspan="2"><u>Updates for Bulletin AY19/20</u>
Link: https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf

Circular title: FoS: Departments of Mathematics and Statistics & Data Science — Proposed Changes to the Requirements of the Minor in Data Analytics</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Circular no.: BUS Circular 10 AY21/22 Page 256 of 260 3.4.3.5 Minor in Data Analytics **Revised text (additions/changes in red):** To be awarded a Minor in Data Analytics, a student must complete 20 MCs of the following modules: 1) GEA1000 Quantitative Reasoning with Data *or* GER1000 Quantitative Reasoning* *or* BT1101 Introduction to Business Analytics *or* DSA1101 Introduction to Data Science *or* DSE1101 Introductory Data Science for Economics* *or* IE1111R Industrial & Systems Engrg Principles & Practice I* or ST1131 Introduction to Statistics and Statistical Computing 2) MA2401 Introductory Mathematics with R^ 3) DSA2101 Essential Data Analytics Tools: Data Visualisation 4) DSA3361 Inferential Data Analytics 5) DSA3362 Predictive Data Analytics *or* DSA3102 Essential Data Analytics Tools: Convex Optimisation *or* DBA3701 Introduction to Optimisation * GER1000 will be discontinued after AY2020/2021 and DSE1101 is offered only to students in the Data Science and Economics XDP. IE1111R is offered only to students in the Industrial and Systems Engineering programme. ^ Students reading the Minor in Data Analytics may replace MA2401 by three modules, with one module in each of the areas of calculus, linear algebra and probability, as follows: Calculus: MA1102R/MA2002 Calculus; MA1312 Calculus with Applications Linear algebra: MA1101R/MA2001 Linear Algebra I Probability: MA2216/MA2116/ST2131 Probability

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>MA1505 Mathematics I
MA1507 Advanced Calculus
MA1511 Engineering Calculus
MA1521 Calculus for Computing
MA1311 Matrix Algebra
MA1508E Linear Algebra for Engineering
MA1513 Linear Algebra with Differential Equations
ST2334 Probability and Statistics</td></tr>
<tr><td>26.</td><td>13 Jan 2022</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>

Link: https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.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</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				or Option ~~3~~ 4: CS50 Introduction to Computer Science DYOM edX MOOCs	
			Chemistry, Food Science & Technology	Option 1: COS1000/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: LSM2302 – Computational Thinking for Life Sciences or Option ~~4~~ 5: CS50 Introduction to Computer Science DYOM edX MOOCs	

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
			Pharmacy	For Cohort AY2018/19 to AY2020/21, to read one of the following as an Unrestricted Elective module: 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 ~~3~~ 4: CS50 Introduction to Computer Science DYOM edX MOOCs	
			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 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 Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			<table><tr><td></td><td>GET1050 as the RC4 programme encourages explicit use of representing thinking, using computer models.</td></tr></table>
27.	13 Jan 2022	FoS	**Updates for Bulletin AY19/20** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_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 205 of 263 **3.4.3.3 Minor in Bioinformatics** To be awarded a Minor in Bioinformatics, a student must complete the following modules: **Core Modules (12 MCs)** CS1010/CS1101S Programming Methodology (or its variant) LSM2241 Introductory Bioinformatics LSM3241 Genomic Data Analysis **Elective Modules (8 MCs)** 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 • ZB4171 Advanced Topics in Bioinformatics This minor will be open to all majors except Computational Biology.

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
28.	13 Jan 2022	FoS	**Updates for Bulletin AY19/20** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.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 221 of 263 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 Any four from the following elective modules (at least one at Level 3000 and above): • PR1301 Complementary Medicine and Health • 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 • 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 • PR4205 Bioorganic Principles of Medicinal Chemistry • SP4263/FSC4203 Forensic Toxicology and Poisons
29.	15 Feb 2022	FoS	**Updates for Bulletin AY19/20** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: Faculty of Science: Department of Physics – Proposal to Revise the Requirements of the Minor in Medical Physics

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Circular No.: BUS Circular 15 AY21/22 Page 226 of 261 3.4.3.10 Minor in Medical Physics **Revised text (additions/changes in red):** 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 or HSI2014 Science, Medical Technology and Society 2. 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 8 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 6. LSM4243 Tumour Biology 7. LSM3223 Immunology 8. LSM3243 Molecular Biophysics 9. EE4603 Biomedical Imaging Systems 10. LSM2106 Fundamental Biochemistry
30.	15 Feb 2022	FoS	**Updates for Bulletin AY19/20** **Link:** https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf Circular title: FoS: Mathematics – Proposal for Changes to Requirements of the Second Major in Mathematics

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>

3.4.2.5 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 40 MCs from non-overlapping modules of the following:

<table>
<tr><th>Module Level</th><th>2nd Major Requirements</th><th>Cumulative Major MCs</th></tr>
<tr><td>1000

(12-14 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</td><td>12-14</td></tr>
</table>
</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)		
				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)	
			Level-2000 (16-18 MCs)	Pass MA2101/ MA2101S Linear Algebra II MA2108/ MA2108S Mathematical Analysis I	28-32

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>MA2104 Multivariable Calculus / MA2501 Differential Equations and Systems

MA2216/MA2116/ST2131 Probability or ST2334 Probability and Statistics</td><td></td></tr>
<tr><td>Level-3000 &
Level 4000
(12-15 MCs)</td><td>Pass
Three modules from List III, IV, where at least two are MA-coded or ST3236 or ST4238</td><td>40-47</td></tr>
</table>
</td></tr>
<tr><td>31.</td><td>6 Jun 2022</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://nus.edu.sg/registrar/docs/info/nusbulletin/bulletin-updates-ay1920.pdf

Circular title:
FoS: Biological Sciences – Revision to the Requirements for the Minor in Bioinformatics
Circular No.: BUS Circular 24 AY21/22

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<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 (12 MCs)</u>
CS1010/CS1101S Programming Methodology (or its variant)
LSM2241 Introductory Bioinformatics
LSM3241 Genomic Data Analysis

<u>Elective Modules (8 MCs)</u>
Pass two modules from the following [for students reading a Major/Second Major/Minor in Computer Science, please select at least one non-CS-prefixed module]:
• CS2040 Data Structures and Algorithms (or its variant)
• CS4220 Knowledge Discovery Methods in Bioinformatics</td></tr>
</table>

<table>
<tr><th>S/N</th><th>Date</th><th>Faculty/School</th><th>(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)</th></tr>
<tr><td></td><td></td><td></td><td>• MA3259 Mathematical Methods in Genomics
• ZB3288 Advanced UROPS in Computational Biology I
• ZB4171 Advanced Topics in Bioinformatics

This minor will be open to all majors except Computational Biology.</td></tr>
<tr><td>32.</td><td>16 Jun 2022</td><td>FoS</td><td><u>Updates for Bulletin AY19/20</u>
Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf

Circular title: FoS: Statistics and Data Science – Proposed Removal of ST5xxx Elective Modules and CS5340 from the Statistics Major Requirements

Circular no.: BUS Circular 25 AY21/22

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3.3.3.10 Statistics

Revised text (additions/changes in red):

<table>
<tr><td>Level-4000
(32-33 MCs)</td><td>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<s>, ST5xxx</s> or List B modules</td><td>92-94</td></tr>
</table>

<u>List A</u>
MA3209 Metric and Topological Spaces or Mathematical Analysis III
MA3218 Applied Algebra
MA3227 Numerical Analysis II</td></tr>
</table>

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			MA3229 Introduction to Geometric Modelling MA3233 Combinatorics and Graphs I MA3236 Nonlinear Programming MA3252 Linear and Network Optimisation MA3256 Applied Cryptography MA3259 Mathematical Methods in Genomics MA3269 Mathematical Finance I QF3101 Investment Instrument and Risk Management or Investment instruments: Theory and Computation CS3210 Parallel Computing CS3230 Design and Analysis of Algorithm CS3223 Database Systems Implementation CS3243 Introduction to Artificial Intelligence CS3244 Machine Learning EC3304 Econometrics II List B MA4211 Functional Analysis MA4229 Fourier Analysis and Approximation or Approximation Theory MA4230 Matrix Computation MA4233 Dynamical Systems MA4254 Discrete Optimisation MA4260 Stochastic Operations Research MA4261 Coding and Cryptography MA4262 Measure and Integration MA4268 Mathematics for Visual Data Processing MA4269 Mathematical Finance II CS4231 Parallel and Distributed Algorithm CS4220 Knowledge Discovery Methods in Bioinformatics CS4243 Computer Vision and Pattern Recognition CS4248 Natural Language Processing ~~CS5340 Uncertainty Modelling in AI~~ DSA4211 High-Dimensional Statistical Analysis DSA4212 Optimisation for Large-Scale Data-Driven Inference EC4303 Econometrics III
33.	16 Jun 2022	FoS	**Updates for Bulletin AY19/20** **Link:** https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_FoS.pdf Circular title: FoS: Mathematics & Statistics and Data Science – Proposed Removal of MA3236 and CS5340 from the Data Science and Analytics Major Requirements

S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			Circular no.: BUS Circular 25 AY21/22 Page 87 of 248 3.3.3.4 Data Science and Analytics **Revised text (additions/changes in red):** **List A — DSA modules** DSA4211 High-Dimensional Statistical Analysis DSA4212 Optimisation for Large-Scale Data-Driven Inference DSA426x Sense-making Case Analysis: YY and ZZ **List B1 — DSA-recognised modules (no hidden pre-requisites)** ~~MA3236 Nonlinear Programming~~ MA3252 Linear and Network Optimisation MA4270 Data Modelling and Computation ST3232 Design and Analysis of Experiments ST3233 Applied Time Series Analysis ST3239 Survey Methodology ST3240 Multivariate Statistical Analysis ST3247 Simulation ST3248 Statistical Learning I ST4231 Computer Intensive Statistical Methods ST4234 Bayesian Statistics ST4248 Statistical Learning II **List B2 — DSA-recognised modules (with hidden pre-requisites)*** CS3210 Parallel Computing CS3223 Database Systems Implementation CS3230 Design and Analysis of Algorithms CS3243 Introduction to Artificial Intelligence CS4224 Distributed Databases CS4225 Big Data Systems for Data Science or Massive Data Processing Techniques in Data Science CS4231 Parallel and Distributed Algorithms CS4234 Optimisation Algorithms CS4243 Computer Vision and Pattern Recognition

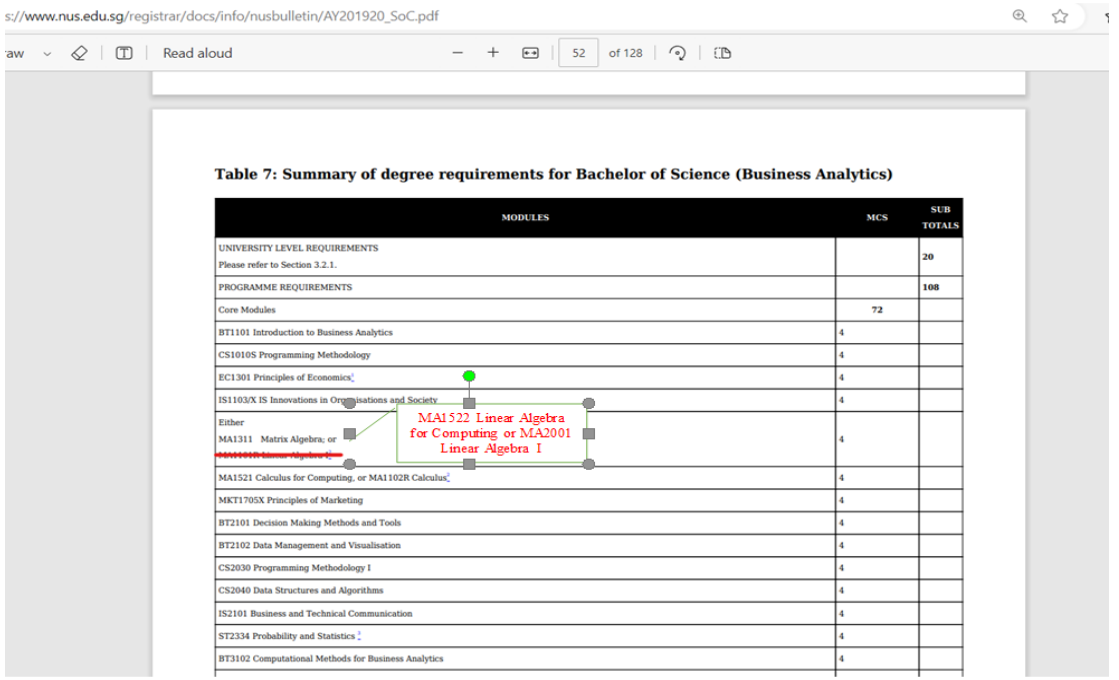
S/N	Date	Faculty/School	(B) Updates Included in NUS Bulletin 2019-20 after archival (i.e., from 1 Jul 2020)
			CS4248 Natural Language Processing ~~CS5340 Uncertainty Modelling in AI~~ MA4230 Matrix Computation * Note: For List B2, i.e., the DSA-recognised modules with hidden pre-requisites, DSA students who wish to read these modules will be provided with academic advice by the Faculty/Department on their study plans where necessary, as such students would have to read 'additional' pre-requisite modules.
34.	20 Jun 2023	SoC	**Updates for Bulletin 19/20** Link: https://www.nus.edu.sg/registrar/docs/info/nusbulletin/AY201920_SoC.pdf **Pg 52** 

Table 7: Summary of degree requirements for Bachelor of Science (Business Analytics)

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	
EC1301 Principles of Economics	4	
IS1103/X IS Innovations in Organisations and Society	4	
Either MA1311 Matrix Algebra; or ~~MA1505R Linear Algebra I~~;	4	
MA1521 Calculus for Computing, or MA1102R Calculus	4	
MKT1705X Principles of Marketing	4	
BT2101 Decision Making Methods and Tools	4	
BT2102 Data Management and Visualisation	4	
CS2030 Programming Methodology I	4	
CS2040 Data Structures and Algorithms	4	
IS2101 Business and Technical Communication	4	
ST2334 Probability and Statistics	4	
BT3102 Computational Methods for Business Analytics	4	

MA1522 Linear Algebra for Computing or MA2001 Linear Algebra I

(20 Jun 2023)