UNC GLOBAL

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

COLLEGE OF ARTS & SCIENCES

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September 1, 2014

Dear Colleagues:

We are submitting for your approval a proposal to add a major in Biology within a UNC-Chapel Hill and National University of Singapore (NUS) Joint Bachelor of Science Degree Program. This major has been voted upon and approved by the UNC-CH Department of Biology. Attached please find for your reference the original proposal describing the Joint Bachelor of Arts Degree Program that was approved in 2006 with five majors (pages 2-9), followed by a detailed proposal including all major requirements for the new Joint Bachelor of Science Degree in Biology (pages 10-27).

It should be noted that the Faculty of Science is a separate academic unit at NUS (distinct from the Faculty of Arts and Social Sciences) while at UNC-CH the College of Arts and Sciences includes arts and humanities, social sciences and science academic disciplines. Hence, this proposal for a joint degree program in Biology is, for UNC-Chapel Hill, an extension of the original proposal within the College of Arts and Sciences for a joint degree program in specific disciplines in arts, humanities and social sciences to include science disciplines but has required negotiation at NUS with the Faculty of Science.

We are happy to provide any further information that you may need to evaluate this proposal.

Yours sincerely:

Dr. Victoria L. Bautch
Chair: Department of Biology

Dr. Robert Miles
Associate Dean: Study Abroad and International Exchanges
Professor of Sociology and International Studies

Joint Bachelor of Arts (B.A.) Program
The University of North Carolina at Chapel Hill
and
The National University of Singapore

Part 1

Description of the Program

The Joint Degree Program is designed for majors in the Social Sciences (i.e., Political Science, Geography, Economics, and History) and in the Humanities (English). (Additional departments interested in offering joint degrees may be added in the future with the mutual consent of the two institutions.) Offered by UNC-Chapel Hill's College of Arts and Sciences and NUS' Faculty of Arts and Social Sciences, the joint degree is targeted at students who wish to broaden and internationalize their education by combining studies at UNC-Chapel Hill with studies at NUS. Students in the Joint Degree Program will choose one of the participating majors. As part of their studies, they will spend a minimum of two regular semesters or a maximum of four regular semesters at the host institution. The Joint Degree Program will permit both institutions to strengthen the selected majors by complementing each other's course offerings, so that students will be able draw upon the particular academic specialties and offerings of the respective departments. Graduates of the program will be awarded a joint Bachelor of Arts by both institutions.

Educational Objectives

The university's mission statement emphasizes that UNC-Chapel Hill has a special responsibility to offer its students a truly international education that provides them with the intellectual skills to operate in an increasingly competitive, global environment. The goal of the joint degree is to provide a small number of highly motivated students with an expanded but carefully structured, academically stimulating undergraduate program in Political Science, Economics, Geography, History, and English. These departments at UNC-Chapel Hill and NUS have agreed to adjust their curricula and to modify degree requirements in such a way as to satisfy their respective academic expectations for students pursuing a joint B.A. Students opting for the joint degree will be expected to satisfy a special set of General Education requirements (consistent with those required at UNC-CH and governed by SACS) and academic major requirements as agreed upon by the two institutions. As a result, the program will not only provide students with the same broad liberal arts education characteristic of UNC-Chapel Hill, but also with more specialized and enhanced knowledge of their major field, characteristic of academic programs at NUS. This will require a modest adjustment of existing course distribution requirements at both institutions, leaving the total at 120 academic credit hours required to earn a degree. Students of the joint degree program will be well prepared to pursue graduate studies or to enter a profession, particularly one with an international dimension.

The joint degree major has been carefully designed with the new undergraduate curriculum being implemented Fall, 2006 in mind. The Senior Associate Dean for Undergraduate Education and

Associate Dean for Undergraduate Curricula, who have special responsibilities for the inauguration of the new curriculum, have been closely involved with making certain that the UNC-Chapel Hill-NUS joint degree fits and enhances it. All of the General Education Requirements of the new curriculum have been retained in the joint degree. Two of them, Experiential Education and Global Issues will be satisfied as a matter of course by participation in the program.

Relationship of the Program to Other Programs Currently Offered

The Joint Degree Program constitutes a creative and flexible enhancement of existing undergraduate majors at UNC-Chapel Hill and NUS that takes advantage of the complementary and differing strengths of the faculty and programs at both universities. As such, the program will initially draw almost exclusively on existing department resources - faculty, courses, offices, and facilities. The chairs of the participating departments at UNC-Chapel Hill and NUS have expressed their full support and enthusiasm for the joint degree, and have worked together within agreed-upon guidelines fashioning the details and requirements of their joint majors.

The Joint Degree Program is intended to be the foundation of a multi-level relationship between UNC-Chapel Hill and NUS that we anticipate will in the near term be strengthened by joint faculty course development and team teaching, as well as collaborative research and exchanges. We envision that some courses taken by Joint Degree Program students will be co-taught using new instructional technology such as Blackboard (currently licensed at both institutions) and direct video conferencing. Faculty will be invited to apply for course development grants where appropriate, and the University Center for International Studies at UNC-Chapel Hill has included a request for such funds as well as for faculty exchanges in its most recent Title VI application. NUS intends to match UNC's funding to provide similar incentives to its faculty.

The degree will be administered by the College of Arts and Sciences in the same way as are other undergraduate degree programs, and its Study Abroad Office, in close collaboration with the Office of the Associate Provost for International Affairs, utilizing existing resources, staff, and facilities.

Relationship to the Institutional Mission and Strategic Plan

The joint degree between UNC-Chapel Hill and NUS will be a significant step towards realizing the expansion of "Carolina's global presence, research, and teaching," one of the six strategic priorities stated in its current five-year Academic Plan. The importance placed on internationalization at UNC-Chapel Hill is reflected in the construction of a new Center for Global Education, the recent creation of two provost-level positions for International Affairs and the inclusion of international education in the "Quality Enhancement Plan" (QEP) created for the 2006 reaccredidation review by SACS. One action measure proposed in this plan focuses on "embedding internationalization more deeply into the curriculum." The new degree does this by strengthening the `global citizenship' objective of the College of Arts and Sciences revised undergraduate curriculum scheduled for implementation this year.

One aspect of this effort to transform UNC-Chapel Hill into a major global university is the building of close, collaborative, multi-faceted partnerships with outstanding universities in carefully selected areas of the world. The joint degree undergraduate program between the College of Arts and Sciences at UNC-Chapel Hill and the Faculty of Arts and Social Sciences at NUS, while modest in its initial scope, will, we anticipate, serve as a model for the establishment of other joint degrees between UNC-Chapel Hill and acclaimed institutions in other parts of the globe. The National University of Singapore is the kind of institution that we have in mind. It is not only acknowledged as one of the finest universities in Asia, but currently ranks 22nd in the Times Higher Education list of "The World's Top 200 Universities." NUS recruits an outstanding student body, boasts a faculty of international reputation, and offers an eclectic range of educational opportunities and curricula to facilitate cooperation and collaboration between our two institutions.

Potential Student Demand

To be successful in an increasingly interconnected world, graduates require knowledge of other nations, cultural sensitivity and the ability to communicate effectively and negotiate with people from different backgrounds. Students have long realized the growing demand for a globally competent workforce. This is evident in the rapid growth of International and Area Studies at UNC-Chapel Hill. Established in 1998, that curriculum now has over 400 majors and is one of the ten most popular units in the College of Arts and Sciences. Similar growth is evident in the expansion of Study Abroad programs. Nearly one-third of all undergraduates at UNC-Chapel Hill participate in a foreign program, the highest percentage of any public university in the country. Furthermore, students have become increasingly enthusiastic about foreign languages, and are opting to develop their skills in them by studying abroad. NUS is particularly strong in the teaching of Asian languages, and we fully anticipate that many of the students participating in the joint degree program will take advantage of the opportunity to advance their knowledge of one or more of them.

The joint degree program with NUS has the added advantage of well-established existing student exchange between the two universities initiated in the late 1990s and that now sends upwards of ten to fifteen students a year to the respective campuses. In addition for the past five years UNC-Chapel Hill has sent 25 first year students each summer to an eight week introductory "Asian immersion" program in Singapore and (for a week) in Thailand. The program, funded by a private donor, will continue and will provide an important cohort of students for the joint degree program. In an informal poll of the NUS and UNC exchange students, as well as former participants in the Singapore Summer Immersion Program whom we involved in the planning, indicated a good deal of enthusiasm for the opportunity to complete a joint major so long as it did not increase the overall credit hour requirements and time-to-degree. It does neither. To be eligible students from NUS must be on four year, honors track (there is a three year, non-honors alternative at NUS), while the UNC-Chapel Hill students will be traditional undergraduates, and required to meet a minimum 3.3 grade point average to be considered for participation. The NUS/UNC-Chapel Hill degree is initially targeted towards 5 to 10 highly motivated, able students, many of whom will be pursuing a degree with honors. We are confident that there will be strong demand for the small number of available spaces.

Impact on Existing Undergraduate Programs

It is important to remember that these are students who would be majoring in their chosen departments with or without the joint degree opportunity. The joint degree program will enhance the participating academic majors by adding a unique international component to their offerings, and complementing the particular academic strengths of the departments at the two institutions. Students will have a wider and more diverse selection of course offerings from which to choose and a more diverse faculty recruited from all over the globe with whom to study and interact during the time they spend in residence at the other University. UNC-Chapel Hill students will continue to receive a well-rounded liberal arts education that will meet the distribution requirements of the new undergraduate curriculum while also being able to explore their major field in more depth. Because the number of anticipated joint degree students will be relatively small and majoring in well-established, highly productive departments there is no risk of stretching existing resources or diluting the degree productivity of these departments.

The joint degree program will not duplicate a program offered in North Carolina or elsewhere. Despite extensive inquiries, catalogue reviews and internet searches of the web sites of universities and colleges we have been unable to find any institutions of higher education in North Carolina or in the country for that matter, that offer an *undergraduate* international joint degree. Several universities profess to be considering the establishment of such programs as part of their international strategic planning, but as best we can tell none have been implemented. NUS has one joint degree program with the Australian National University in Canberra and in addition to the proposed joint majors with UNC departments, is pursuing similar arrangements with at least one British university. The closest parallels are *graduate* and *professional* joint degree programs that a small number of universities offer in this country.

The only joint degree program in which UNC-CH currently participates is the graduate degree program in Biomedical Engineering with North Carolina State University. A program for a joint Pharmacy degree with Elizabeth City State University is currently under development.

While they do not grant joint degrees, there are two very successful graduate level collaborative international programs at UNC-Chapel Hill: (1) The Trans-Atlantic Masters Program (TAM) is a unique, intensive degree program providing students with the opportunity to pursue graduate study in international affairs at several universities in the United States and Europe. Students can choose to receive a master's degree from UNC-Chapel Hill, or they may opt for a degree granted by one of the participating European universities. The TAM Program is administered by the Center for European Studies, which has expressed an interest in establishing joint degrees with selective European universities. (2) The OneMBA Program at the Kenan-Flagler Business School is an innovative global executive MBA created by a collaborative partnership of five universities on four continents. UNC-Chapel Hill's OneMBA graduates receive the same MBA degree as graduates of UNC-Chapel Hill's full-time MBA Program. In addition, they also receive a special recognition document created by the five OneMBA partner universities, referred to as a "diploma."

ADMISSION

UNC-Chapel Hill undergraduate students and NUS students pursuing a four-year degree may declare one of the joint majors at their home institution no later than the second semester of their junior or third year. To do so, UNC-Chapel Hill students will consult with their academic advisor in the College of Arts and Sciences, the Director of Undergraduate Studies in their major department, and the Director of Advising in Study Abroad.

Students at NUS will consult with the adviser for the joint degree program in their major department and apply to the Registrar's office at that institution.

Documents to be submitted for admission

UNC-Chapel Hill students must complete a Joint Degree Declaration form containing the signatures of the three individuals at UNC-Chapel Hill with whom they consulted. The form must be submitted to the UNC-Chapel Hill Office of the University Registrar where the student records will be changed to reflect the student's joint degree.

DEGREE REQUIREMENTS

Total hours required: 120 credit hours
Major: 60 credit hours
Minor: NA

Grades required

Students need a GPA of 3.3 (UNC-Chapel Hill grading system) or 4.0 (NUS grading system) to be eligible to participate in the joint degree program.

Amount of transfer credit accepted

The joint degree program will follow the regulations regarding transfer credit established at UNC-Chapel Hill. A minimum of 45 hours of UNC-CH credit will be required for a degree. The requirement that 24 of the last 30 academic hours must be in UNC-CH credits will be waived to allow students to participate in this program during their senior year. Transfer students are, however, less likely to participate than students who enter Carolina for their first year.

Other requirements (e.g., residence, comprehensive exams, thesis, dissertation, clinical or field experience, "second major," etc.)

Students in the joint degree program are required to study in residence for a minimum of two regular (fall and/or spring) semesters and a maximum of four regular semesters at the partner university. Students at either university have to be enrolled as full-time students in their home university. For UNC-Chapel Hill students, this corresponds to a minimum of 12 credit hours per semester and a maximum of 18 (higher with appropriate permissions) credit hours per semester, and for NUS students a maximum of 24 Modular Credits (MC) and minimum of 16 MC.*

* Students at NUS accrue MC credit at the average rate of 20 per semester for five courses. The UNC equivalent would be five, three-hour courses for 15 credit hours. In other words, 1 NUS MC = 1.33 UNC credit hours.

Language and/or research requirements

The new UNC-Chapel Hill curriculum requires students to fulfill seven credit hours of language (one four and one three credit hour course) with a level 2 placement. Students must achieve at least level 3 in the foreign language. (Note: NUS language courses always carry the equivalency of three credit hours, although the courses meet four to six class hours a week. Therefore, NUS students will have fulfilled the language requirement with the equivalency of six credit hours.)

Time limits for completion

Students will be governed by the completion requirements of their home institution.

COMPARISON OF REQUIREMENTS*

NUS	JOINT DEGREE	UNC-CH
Major – 66 credit hrs (88 MC)	Major – 60 credit hrs (80 MC)	Major – up to 45 credit hrs (60 MC)
		Electives – up to 24 credit hrs (32 MC)
Electives – 21 credit hrs (28 MC)	Electives–15 credit hrs (20 MC)	General Education – 51 credit hrs (68 MC)
	General Education – 45 credit hrs (60 MC)	
General Education – 33 credit hrs (44 MC) University requirements Faculty requirements		

*For specific majors see the attached Appendix 1.

ADMINISTRATION

The joint degree program will be administered on the Chapel Hill campus by the College of Arts and Sciences and its Study Abroad Office in close collaboration with the Office of the Associate Provost for International Affairs. At NUS the joint degree program will be administered by the Vice Dean of the Faculty of Arts and Social Sciences and the Registrar. A joint faculty-student committee of four representatives from participating departments at each institution will be established by the deans.

EVALUATION PLANS

Evaluation of the joint degree program will be integrated into the new Outcome Assessment Plans that each participating department has developed for its major in conjunction with the recent SACS requirements. Since there will only be a small number of joint degree students in each department, the department will collect the suggested student papers, exams, and surveys from all joint degree students. NUS will follow the same procedures as UNC for the joint degree program and collect and assess the appropriate student work in the equivalent classes suggested by each assessment plan. NUS will share the results with UNC.

Given the uniquely international nature of the joint degree program, the committee that has oversight over the degree, will also assess:

Outcome 1: knowledge of the practices in student's discipline in the host country

Outcome 2: knowledge about the educational, socio-political, and economic system of the student's host country

Outcome 3: ability to effectively communicate, assimilate to, and function in the host culture (cross-cultural competence)

In order to assess the suggested outcomes, students will be asked to respond in essay form to a brief e-mail questionnaire. UNC's Study Abroad Office will e-mail the questionnaire to the joint degree students shortly after they have returned home from studying at the host university:

Questions for Outcome 1: Is your academic discipline practiced similarly or differently in the host country? Please explain. (300-500 words)

Question for Outcome 2: Please describe the most meaningful insights into your host region's educational, socio-political, and economic system that you have gained? (300-500 words)

Questions for Outcome 3: Please explain what you consider as the most important knowledge you have gained about communicating with host country nationals as well as assimilating to and functioning in the host country? (300-500 words)

The joint degree committee will review the outcome assessments on an annual basis and make adjustments to the degree if necessary.

Proposal for Joint Degree Programme in Bachelor of Science
Faculty of Science, National University of Singapore
and
College of Arts and Sciences, University of North Carolina at Chapel Hill

1. Overview

This document outlines a joint programme combining the Bachelor of Science (Honours) [B.Sc. (Hons.)] in Life Sciences offered by the Faculty of Science (FoS), NUS, and the Bachelor of Science (BS) in Biology offered by the Department of Biology, College of Arts and Sciences, University of North Carolina at Chapel Hill (UNC-CH).

The proposed joint degree programme (JDP) is designed to be completed in four years, to be taught at NUS and UNC-CH. This JDP will combine the strengths of both universities' undergraduate curricula, integrate overseas experience into undergraduate studies, and award a jointly validated Bachelor of Science degree qualification. NUS students will complete the requirements for an Honours class while UNC-CH students will have the option to pursue (or not to pursue) the Honours class.

Presently, there is a Bachelor of Arts JDP between Faculty of Arts and Social Sciences (FASS), NUS, and College of Arts and Sciences, UNC-CH, which was approved in 2006.

2. Purpose

This JDP is proposed with the following strategic intents:

a. To enhance undergraduate education and experience.
b. To mutually benefit from the complementary nature of the two universities. This is in terms of geography, as well as the differences in the undergraduate programme structure whereby UNC-CH offers a more extensive and structured General Education programme than NUS while NUS has a more intensive set of major requirements.
c. To create an undergraduate programme with an integral study abroad component, hence developing students with a global perspective.
d. To offer undergraduates the opportunities of certification and training by both universities, hence providing them a competitive edge in the employment market.
e. To explore the possibility of collaborative teaching between the two universities which may further lead to joint efforts in terms of research.

3. Principles

3.1 A Distinctive Programme

This JDP is intended to be different from the typical Bachelor of Science degrees at either of the two universities. It will be derived on the basis to have the broad and structured General Education component of the UNC-CH degree as well as the extended study of major at NUS.

3.2 One Structure, Two Tracks

There will be one overarching structure for this JDP for students from either of the two universities to follow through. However, as both universities would have different major requirements in terms of foundation during the first and second years of studies as well as Honours year requirements at the fourth year, two tracks of study, one for UNC-CH students and another for NUS students, will be proposed. These two tracks will differ in terms of the exact module line-ups; nonetheless, both will share the same structural components.

3.3 Credit and Grade Transfer

Students will transfer the credits and grades achieved for taking courses/modules during their stay at the partnering host university back to their home university. Grades will be converted using an agreed equitable scale which was previously approved in the JDP between FASS and the College of Arts and Sciences (please refer to Section 4.2).

3.4 Timing and Duration with the Partner University

Students will stay at the partnering host university for a minimum of two (2) to a maximum of four (4) regular semesters, equivalent to one to two academic years. This period with the partner university may occur at any time after the first year of study and before the fourth or last year.

It is expected, and recommended, that students from both UNC-CH and NUS make the stay with the partner university within the Semesters 4 – 6 inclusive of their course of study. This allows the students to complete the stipulated foundations at their respective home universities, and spend about two to three regular semesters with the partner universities, before returning for their final year of study.

4. Workload and Grades

4.1 Workload Conversion

NUS quantifies workload as modular credit (MC in short), with the majority of modules earning 4 MCs, and the typical student workload per semester at five 4-MC modules. UNC-CH quantifies workload in academic credit hours (hours in short), with the majority of courses earning 3 hours, and the average student workload per semester at five 3-hour courses.

The guiding exchange rate for workload is thus:
4 MCs = 3 hours; 1 MC = 0.75 hours OR 1 hour = 1.33 MC

4.2 Grade Conversion

Both NUS and UNC-CH use a letter grade scheme which translates into a numerical scale for the purpose of CAP (Cumulative Average Point) or GPA (Grade Point Average) calculations, respectively. NUS uses a 5-point scale while UNC-CH uses a 4-point scale. Nonetheless, the grade-point relation is comparable for both universities, as shown in the following table.

NUS		UNC-CH	
5-Point Scale	Grade	Grade	4-Point Scale
5.0	A+/A	A	4.0
4.5	A-	A-	3.7
4.0	B+	B+	3.3
3.5	B	B	3.0
3.0	B-	B-	2.7
2.5	C+	C+	2.3
2	C	C	2.0
1.5	D+	C-	1.7
1.0	D	D	1.5
0.0	F	F	0.0-1.0

The home university of students in the JDP will calculate their CAP or GPA at the end of each semester. When the semester is spent at the partnering host university, the calculation will be made by translating the letter grades achieved to the numerical points following the home university's scale.

5. Joint Degree Structure

5.1 Key Differences

The Major Requirements of the NUS FoS B.Sc. (Hons.) in Life Sciences degree take up about 60% of the total graduation requirements (100 out of 160 MCs). The component equivalent to UNC-CH General Education, i.e. University Level Requirements and Faculty Requirements, is close to 20% (28 out of 160 MCs), and the remaining 20% (32 out of 160 MCs) is made up of unstructured choices of modules known as Unrestricted Free Electives.

The Major Requirements of the UNC-CH BS in Biology degree are close to 60% of the total graduation requirements. The remaining 40% or more come under the General Education component. Students are required to accumulate 123 academic credit hours for graduation; they are required to add free electives if needed, after fulfilling the Major and General Education Requirements.

5.2 Proposed Joint Structure In Brief

Students in this JDP will fulfill the General Education Requirements stipulated by UNC-CH. As for Major Requirements, there will be a set specified for UNC-CH students and another for NUS students, though both sets will be matched structurally. Students are required to accumulate the minimum workload credits stated by their home universities, and they are required to add free electives if needed, after fulfilling the Major and General Education Requirements.

The following two sections will describe in detail the General Education component and Major component of this JDP.

6. General Education

6.1 Existing Requirements

Both NUS and UNC-CH dedicate a portion of their undergraduate programmes to give students the opportunity for broad-based and cross-disciplinary learning, leading to substantial breadth in both curricula. However, the terminology and the approach are different.

For NUS, structured General Education comes in the forms of University Level Requirements (composed of General Education Modules, Breadth Modules, and Singapore Studies Modules) and Faculty Requirements. For a FoS B.Sc. (Hons.) degree, these take up around 20% of total graduation requirements (i.e. 24-32 out of 160 MCs; about 8 modules), and students fulfill these by following certain rules involving specific groups of modules. NUS students are free to tap on the flexibility of Unrestricted Free Electives to further expand on their General Education; this is solely on student's discretion.

For UNC-CH, structured General Education is more extensive, taking up to 40% of the total graduation requirements (about 18 courses), which are basically the remaining workload after counting the major requirements. Students fulfill these by following certain rules involving specific groups of modules.

Despite the differences, the aims of both systems are similar. Upon completion of the undergraduate studies, graduates will develop a good understanding and appreciation of the fields and disciplines external to their majors, an awareness of their local and regional contexts, as well as a proper set of thinking and communication skills.

6.2 Proposed JDP General Education Requirements

One of the objectives of this JDP is to tap on the extensive and structured General Education programme offered by UNC-CH. The understanding is that by meeting the requirements of the larger UNC-CH General Education, the objectives of NUS FoS General Education are similarly met. In addition, the broad NUS educational aim is also maintained.

To avoid terminology confusion, the General Education Requirements for this JDP are expressed in UNC-CH terms. This also means that the JDP General Education Requirements replace the University Level Requirements and the Faculty Requirements with respect to NUS students.

For NUS Life Sciences Major students, the UNC-CH General Education Requirements will be adopted wholly with a number of waivers. Apart from taking up the roles of University Level Requirements and Faculty Requirements, this expanded General Education will extend into the workload for Unrestricted Free Electives, meaning that NUS students have less or no Unrestricted Free Electives to fulfill. UNC-CH Biology Majors will meet the UNC-CH General Education Requirements as per their home university but with a number of waivers too. The details are expressed in the following sections touching on the individual components of UNC-CH General Education, and a summary is given in Annex A.

6.3 Foundations

6.3.1 English Composition and Rhetoric [1 course; 3 hours = 4 MCs]

UNC-CH Biology Majors read one course, ENGL 105, covering the command of English language in both written and verbal modes for academic purpose.

NUS students need to meet a certain level of English qualification at the point of matriculation, as it is the default teaching language. This is fulfilled with certain minimum grades in the candidates' pre-university qualifications or by passing the Qualifying English Test (QET). Matriculated FoS students who fail to meet this will need to read the zero-MC module ES1102 English for Academic Purposes. Those who have met the English qualification are deemed as being waived from reading ES1102.

6.3.2 Foreign Language [up to 3 courses; up to 9 hours = 12 MCs]

UNC-CH Biology Majors will fulfill the foreign language requirement following their home university rules, which allow advanced placement or waiving one or more of the courses required based on the students' pre-university qualifications.

For NUS Life Sciences Majors, the foreign language requirement is waived. It is deemed as already satisfied by NUS students who are generally Singaporean students who have studied at least a second language extensively, on top of English, during primary and secondary schools and pre-university education.

6.3.3 Quantitative Reasoning [1 course; 3 hours = 4 MCs]

UNC-CH Biology Majors read MATH 231 (a calculus course) to fulfill this requirement.

For NUS Life Sciences Majors, students generally possess the pre-university Mathematics qualification at H2 or GCE 'A' Level, which is a partial admission criterion for this undergraduate programme. For a small handful without this, they will read the bridging module MA1301 Introductory Mathematics (covering high school level algebra and calculus) to meet the equivalent qualification. Hence, this requirement will be waived for NUS students, as they have met the required background in calculus at the point of admission.

6.3.4 Lifetime Fitness [1 course; 1 hour = 0.33 MC]

This is waived for both UNC-CH and NUS students considering there is no NUS equivalent for this requirement, and the commitment level for this JDP.

6.4 Approaches

6.4.1 Physical and Life Sciences [2 courses; 7-8 hours = around 8 MCs]

UNC-CH Biology Majors read BIOL 101-101L and CHEM 101-101L to fulfill this requirement as well as counting into major requirements. For NUS Life Sciences Majors, the Year 1 major core modules LSM1301 and CM1401 would have sufficiently met this requirement while at the same time contributing to the major requirements.

6.4.2 Social and Behavourial Sciences [3 courses; 9 hours = 12 MCs]

Both UNC-CH and NUS students will meet this requirement following UNC-CH rules. NUS students should complete all the courses under this requirement at UNC-CH, while UNC-CH students can choose to complete the courses at UNC-CH or the modules approved for this requirement at NUS.

6.4.3 Humanities and Fine Arts [3 courses; 9 hours = 12 MCs]

Both UNC-CH and NUS students will meet this requirement following UNC-CH rules. NUS students should complete all the courses under this requirement at UNC-CH, while UNC-CH students can choose to complete the courses at UNC-CH or the modules approved for this requirement at NUS.

6.5 Connections

6.5.1 Communication Intensive [1 course; 3 hours = 4 MCs]

UNC-CH Biology Majors read BIOL 101-101L to fulfill this requirement as well as counting into major requirements. As the Honours project/thesis is accepted as a way to meet this requirement, NUS Life Sciences Majors read LSM4199 Honours Project in Life Sciences to fulfill this as well as major requirements.

6.5.2 Quantitative Intensive or Second Quantitative Reasoning [1 course; 3 hours = 4 MCs]

UNC-CH Biology Majors will read one course from the following to fulfill this requirement: MATH 232, MATH 283, COMP 110, COMP 116, STOR 155, STOR 215.

NUS Life Sciences Majors fulfill this with ST1232 Statistics for Life Sciences, which also counts toward major requirements (and faculty requirements in NUS context).

6.5.3 Experiential Education [1 course; 3 hours = 4 MCs]

This is waived for both UNC-CH students and NUS students. The integrated study abroad component is deemed to fulfill this requirement.

6.5.4 U.S. Diversity or Singapore Studies [1 course; 3 hours = 4 MCs]

This requirement is based on increasing the understanding of the country where the university is located. UNC-CH students will fulfill this requirement following their home university rules. NUS students will read a Singapore Studies module at NUS.

6.5.5 North Atlantic World [1 course; 3 hours = 4 MCs]

Both UNC-CH and NUS students will meet this requirement following UNC-CH rules, completing this one course at UNC-CH.

6.5.6 Beyond the North Atlantic World [1 course; 3 hours = 4 MCs]

Both UNC-CH and NUS students will meet this requirement following UNC-CH rules, completing this one course at UNC-CH. Students may also choose to complete a module approved for this requirement within NUS, which has to be Asia-related.

6.5.7 World before 1750 [1 course; 3 hours = 4 MCs]

Both UNC-CH and NUS students will meet this requirement following UNC-CH rules, completing this one course at UNC-CH. Students may also choose to complete a module approved for this requirement within NUS, which has to focus on Asian civilisation before 1750.

6.5.8 Global Issues [1 course; 3 hours = 4 MCs]

Both UNC-CH and NUS students will meet this requirement following UNC-CH rules, completing this one course at UNC-CH.

7. Major

7.1 Existing Requirements

The UNC-CH Biology Major Requirements are reflective of the broad foundation teaching philosophy of the university. They include an introductory course in Biology by default, a Physics component of two courses, a Chemistry component of five sets of courses, and a quantitative Mathematics course in calculus. The foundation in Biology encompasses four courses: three essential core courses that cover ecology, genetics, biochemistry and cell biology; and one elective that touches on organismal structure and diversity. On the advanced electives for Biology Major which consist of six BIOL courses, UNC-CH students enjoy much flexibility in their choices which range from course levels 200-600. The Honours preparation and thesis modules may also be counted as two of the six required advanced electives.

In comparison, the NUS Life Sciences Major Requirements cover a more in-depth curriculum. The introductory Biology module is not a default; it is only needed for students without the university stipulated pre-university biology qualification. There is a Chemistry module and a Statistics module, both customized for Life Sciences Major. The foundation in Biology is more extensive, encompassing nine modules: seven essential modules that cover biodiversity, biochemistry, metabolism, genetics, general physiology, molecular biology and cell biology; an elective chosen between ecology and bioinformatics; and a technique-based experimental elective in biochemistry, molecular and cell biology, or microbiology. On the advanced electives, NUS students need to read five Level 3000 Life Sciences Major modules, following the

specialization rule. For the Honours year, on top of a year-long Honours project, students will read five Level 4000 Life Sciences Major modules, following the specialisation rule.

7.2 Two Sets of Major Requirements

In order to align the two sets of major requirements, they are broken down into components which are matched subsequently. This JDP recognizes that although the foundations of the two majors differ in details, both are generally comparable in contents (with a couple of exceptions) and will serve sufficiently well when students from one university read the advanced electives in the partnering host university.

The details to the revised requirements to UNC-CH Biology Major and NUS Life Sciences Major for this JDP are expressed in the following sections touching on the individual components, and a summary is given in Annex B.

7.2.1 Physics Component

UNC-CH students read two modules, either PHYS 104 and 105 (covering general physics) or PHYS 116 and 117 (covering mechanics, electromagnetism, and optics). The NUS Life Sciences Major does not have an isolated physics component. Nonetheless, there is a physics module customized for Life Sciences Major, PC1421 Physics for Life Sciences (covering general physics laws, mechanics, electromagnetism, and optics). Although this is not essential to the major, in order to match this component, it is proposed to add this module to the Life Sciences Major requirements in this JDP. This module also counts towards the faculty requirements in the NUS context.

7.2.2 Chemistry Component

UNC-CH students read five sets of courses, CHEM 101-101L, 102-102L, 241-241L, 261 and 262-262L (covering descriptive and quantitative chemistry, analytical chemistry and organic chemistry). It is to be noted that UNC-CH students will be awarded a Minor in Chemistry by their home university upon completing the above Chemistry courses. NUS students read a chemistry module customized for Life Sciences Major, CM1401 Chemistry for Life Sciences (covering physical, analytical and organic chemistry) for the major requirements (and the faculty requirements in NUS context). In addition, NUS students have two essential biochemistry modules for the Life Sciences Major, LSM1101 Biochemistry of Biomolecules and LSM2101 Metabolism and Regulation. As they do not follow the chemistry component of UNC-CH, NUS students will not be awarded the Chemistry Minor from UNC-CH.

7.2.3 Quantitative Intensive Component

This is the second Quantitative Reasoning within General Education (see Section 6.5.2). UNC-CH students read Mathematics MATH 232 (a calculus course), Computing COMP 110 or 116, or Statistics STOR 155 or 215. NUS students read ST1232 Statistics for Life Sciences to fulfill the Quantitative Intensive within General Education (see Section 6.5.2) requirements.

7.2.4 Biology Main Component

UNC-CH Biology students and NUS Life Sciences students will follow their respective major requirement module line-ups. The principle is that collectively, the syllabi covered by the core Biology courses at UNC-CH are generally recognised as equivalent to that of the core Life Sciences modules at NUS; the differences lie in how the topics are packaged into the different courses/modules:

UNC-CH Core Biology Courses	Core Topics	NUS Core Life Sciences Modules
BIOL 101-101L Principles of Biology	Foundational Biology Principles	LSM1301 General Biology
	General Physiology	LSM1104 General Physiology LSM2103 Cell Biology
BIOL 205 Cellular and Developmental Biology	Cell Biology	
	Developmental Biology	LSM3233 Developmental Biology
BIOL 202 Molecular Biology and Genetics	Genetics	LSM1102 Molecular Genetics LSM3252 Evolution and Comparative Genomics
BIOL 201 Ecology and Evolution	Evolution	
	Ecology	LSM2251 Ecology and Environment
One 200 Organismal Biology Course with laboratory	Organismal Biology	LSM1103 Biodiversity

UNC-CH students will read the introductory biology course BIOL 101-101L, which can be fulfilled with advanced placement. The NUS equivalent is the biology bridging module LSM1301 General Biology. NUS Life Sciences Majors by default have the pre-university Biology qualification at H2 or GCE 'A' Level which does away the need to read LSM1301. Hence, this component is waived for NUS students.

It is recommended that UNC-CH students complete the core courses BIOL 201, 202 and 205 at their home university; NUS students will do the same for LSM1104, LSM2102, LSM2103 and LSM2251. Both UNC-CH students and NUS students read LSM1103 at NUS for their core major requirements. For NUS students, two Level 3000 LSM-coded electives, LSM3233 Developmental Biology and LSM3252 Evolution and Comparative Genomics, are compulsory to meet the requirements for topics on developmental biology and evolution, respectively. These two modules contribute to two of the five Level 3000 LSM-coded electives needed for the NUS Life Sciences Major Requirements, and at the same time are counted as reading the equivalent to the UNC-CH courses of BIOL 443 Developmental Biology and BIOL 471 Evolutionary Mechanisms, respectively.

Apart from the LSM-coded modules mentioned here as well as for the Chemistry Component (see Para 7.2.2), NUS students need to complete a higher level molecular biology module LSM2102 and a technique-based Level 2000 LSM-coded experimental elective module in addition to the core requirements.

As UNC-CH students and NUS students are expected to complete generally their respective core major requirements at their home universities before going over to the partner universities, they are deemed to have completed the core foundation topics recognised by both institutions, and can directly move on to read advanced level courses/modules requiring these topics as pre-requisites.

Equivalent UNC-CH courses and NUS modules are identified for the elective choices (see Annex C). Students in this JDP may take the course/module in their home university or its equivalent in the partner university to fulfill the respective major requirements.

For the Honours year segment, NUS Life Sciences Majors are required to complete their Honours year curriculum at their home university. NUS students will follow the Life Sciences Major Level 4000 requirements rule to complete LSM4199 Honours Project in Life Sciences, and five Level 4000 Life Sciences Major electives, with at least three from one area of focus.

UNC-CH students will have the option to pursue (or not to pursue) the Honours class. For those who do, the UNC-CH Honours component comprises two courses: the Honours preparatory course BIOL 395 Undergraduate Research and BIOL 691H Senior Honors Thesis. For UNC-CH Biology Majors, these two courses contribute to fulfilling two of the required four BIOL electives numbered above 205.

7.3 Specialisation

NUS Life Sciences Majors are required to complete a specialisation (Biomedical Science, Molecular and Cellular Biology, or Environmental Biology) following the major requirements Level 3000 and Level 4000 rules. This will not apply to UNC-CH Majors who have no specialisation.

8. Overall Graduation Requirements

The overall graduation requirements for this JDP are summarized in the following table:

Graduation Requirements	NUS BSc (Hon) in Life Sciences		UNC-CH Joint Degree BS (Hon) in Biology	
	Normal Degree	Joint Degree	Credit Hours	NUS MC Equivalent
Major	100 MCs	104 MCs	69 Hours*	92 MCs
General Education (i.e. University Level Requirements and Faculty Requirements)	28 MCs	44 MCs	Enough hours to meet requirements*	
Unrestricted Free Electives	32 MCs	12 MCs	No. of free electives as needed to complete 123 credit hours	
Total	160 MCs	160 MCs	123 Hours	164 MCs
	(Minimum MCs needed are 160)		(Minimum hours needed are 123)	

*Some courses can be double-counted for more than one requirement, depending on the exact courses taken.

For NUS Life Sciences Majors, there are 12 MCs remaining to meet the graduation requirements after counting the Major Requirements and the General Education Requirements. These will be fulfilled with Unrestricted Free Electives, either with NUS modules or UNC-CH courses.

For UNC-CH Biology Majors, if there are any remaining credit hours to be fulfilled to meet the graduation requirements after counting the Major Requirements and the General Education Requirements, they will be similarly fulfilled with Unrestricted Free Electives, either with NUS modules or UNC-CH courses.

A typical schedule of completion of the JDP is displayed in Annex D and Annex E for NUS Life Sciences Majors and UNC-CH Biology Majors, respectively. Students from both universities should make the stay with the partner university during the Year 2 to Year 3 of their course of study, and the stay is recommended to be two (2) to three (3) full semesters long.

9. Programme Administration and Management

9.1 Joint Degree Committee

UNC-CH and NUS will establish a Joint Degree Committee (JDC) whose chairs and members are to be appointed by the Dean (or his/her representative) of the College of Arts and Sciences at UNC-CH and the Dean (or his/her representative) of the Faculty of Science at NUS, to oversee and administer all aspects of the JDP. The JDC will comprise at least two members from each university. The size of this JDC may change, but it should always consist of equal representations from each university.

9.2 Admissions and Student Numbers

Each university will be responsible for selection of its own students for the JDP. To begin, the number will be put at a maximum of six (6) students from each university per intake per academic year.

NUS students will be admitted into the programme at the end of the first semester and must have a CAP (Cumulative Average Point) of at least 4.00 (out of 5.00) at the point of selection. UNC-CH students will be admitted between the end of second semester of their first year and the end of second semester of their second year and must have a Grade Point Average (GPA) of 3.4 (out of 4.0).

9.3 Tuition Fees

Students will be billed at the prevailing rate (or otherwise stated) by their home university for tuition fees, whether they are studying at the home university or the partner university.

9.4 Period of Candidature

The typical candidature for students in this JDP is four (4) years. Any extension beyond this must be approved and closely monitored by the JDC, in adherence to the prevailing maximum candidature rules of the home university.

9.5 Award of Degrees

Students must satisfy completely the joint Bachelor of Science degree programme graduation requirements in order to be conferred the joint qualification. The degree scroll will take the format of the home university, with the exception that the crest to the home university will be at the top-left corner while the crest to the partner university will be at the top-right corner of the scroll. The title on the scrolls should be something like (but need not be):

a) For UNC-CH scroll
Bachelor of Science, [optional Honours Class], in Biology (Joint Degree with National University of Singapore)

b) For NUS scroll
Bachelor of Science, [Honours Class], in Life Sciences (Joint Degree with University of North Carolina at Chapel Hill)

9.6 Continuation, Withdrawal and Termination

The continuation requirements are as follows:

- NUS Students

NUS students in this JDP must maintain a Cumulative Average Point (CAP) of 4.00 or above (out of 5.00) for the Bachelor of Science degree. A student whose CAP falls below 4.00 for two consecutive semesters will not be allowed to remain in this programme, but may go on to complete the default B.Sc. degree in Life Sciences.

NUS students in this programme can also choose to withdraw and continue with the default B.Sc. degree study.

- UNC-CH Students

UNC-CH students in this joint degree programme must have a minimum Grade Point Average (GPA) of 3.40 (out of 4.00) at the point of entering this JDP, and maintain a GPA of 3.33 or above for the Bachelor of Science degree. A student whose GPA falls below 3.33 for two consecutive semesters will not be allowed to remain in this programme, but may go on to complete the default BS degree in Biology.

UNC-CH students in this programme can also choose to withdraw and continue with the default BS degree study.

The withdrawal and termination processes will follow the prevailing practices of the home university.

9.7 Dispute Resolution

Any dispute the student may have with either university should be resolved through the appeal process of the university in which they are resident at that point of time. The normal disciplinary procedures of the university in which the student is resident at that point of time will be applied to the student.

Any dispute within the JDC with regards to the administration of this programme will be referred to the Dean (or his/her representative) of the UNC-CH College of Arts and Sciences and the Dean (or his/her representative) of the NUS Faculty of Science.

Annex A: General Education Requirements of JDP

NUS Modular Credits [MCs] (calculated as 3 UNC-CH Credit Hours = 4 NUS Modular Credits)	UNC-CH Credit Hours	For UNC-CH Biology Major Student	General Education Requirements (Based on UNC-CH requirements) [No. refers to UNC-CH credit hours]	For NUS Life Sciences Major Student	NUS Modular Credits [MCs]
			Foundations		
4	3	ENGL 105	English Composition and Rhetoric [3]	ES1102	0
12	Up to 9	Language Levels 1, 2, 3	Foreign Language [up to 12]	Waived for NUS Students	-
4	3	MATH 231	Quantitative Reasoning [3]	MA1301 or waived for NUS Students	-
	-	Waived for Joint Degree Programme	Lifetime Fitness [1]	Waived for Joint Degree Programme	-
			Approaches		
	-	BIOL 101-101L, CHEM 101-101L (for major requirement)	Physical and Life Sciences [7]	LSM1301, CM1401 (for major/ faculty requirement)	-
12	9	To meet UNC-CH requirements	Social and Behavioural Sciences [9]	To meet UNC-CH requirements (complete in UNC-CH)	12
12	9	To meet UNC-CH requirements	Humanities and Fine Arts [9]	To meet UNC-CH requirements (complete in UNC-CH)	12
			Connections		
	-	BIOL 101-101L (for major requirement)	Communication Intensive [3]	LSM4199 (for major requirement)	-
	-	MATH 232, 238; COMP 110,116; STOR 155 or 215 (see major requirements Annex B)	Quantitative Intensive [3]	ST1232 (for major/faculty requirement)	-
	-	Waived for Joint Degree Programme	Experiential Education [3]	Waived for Joint Degree Programme	-
4	3	To meet UNC-CH requirements	U.S. Diversity [3]	One NUS Singapore Studies module	4
4	3	To meet UNC-CH requirements	North Atlantic World [3]	To meet UNC-CH requirements (complete in UNC-CH)	4
4	3	To meet UNC-CH requirements	Beyond the North Atlantic World [3]	To meet UNC-CH requirements (complete in UNC-CH) or NUS Asia-related module	4
4	3	To meet UNC-CH requirements	World before 1750 [3]	To meet UNC-CH requirements (complete in UNC-CH) or NUS module covering Asian civilization before 1750	4
4	3	To meet UNC-CH requirements	Global Issues [3]	To meet UNC-CH requirements (complete in UNC-CH)	4
64 MCs	48 Hrs		**Total Hours/Credits**		44 MCs

Annex B: Summary of Requirements of UNC-CH Biology Major and NUS Life Sciences Major of JDP

UNC-CH Credit Hours [No. of courses]	For UNC-CH Biology Major Student	For NUS Life Sciences Major Student	NUS Modular Credits [No. of modules]
Physics Component			
8 [2]	(PHYS 104 & 105) or (PHYS 116 & 117)	PC1421 Physics for Life Sciences (also for faculty requirement)	4 [1]
Chemistry Component			
18 [5]	CHEM 101-101L, 102-102L, 241-241L, 261, 262-262L	CM1401 Chemistry for Life Sciences (also for faculty requirement) LSM1101 Biochemistry of Biomolecules (also for major requirement) LSM2101 Metabolism and Regulation (also for major requirement)	12 [3]
Quantitative Intensive or Second Quantitative Reasoning Component			
3 [1]	MATH 232, 238; COMP 110,116; STOR 155 or 215	ST1232 Statistics for Life Sciences (also for faculty requirement)	4 [1]
Biology Main Component			
16 [4]	BIOL 101-101L Principles of Biology BIOL 201 Ecology and Evolution BIOL 202 Molecular Biology and Genetics BIOL 205 Cellular and Developmental Biology	LSM1301 General Biology (waived for NUS Students) LSM1102 Molecular Genetics LSM1104 General Physiology LSM2103 Cell Biology LSM2251 Ecology and Environment	16 [4]
4 [1]	One 200 Organismal Biology Course with laboratory	LSM1103 Biodiversity	4 [1]
-	-	LSM2102 Molecular Biology	4 [1]
-	-	One Level 2000 LSM Experimental Elective (LSM2201A/LSM2202A/LSM2203)	4 [1]
14 [4]	Four BIOL courses beyond 205 (at least two with laboratory, and at least two above 400)*	Five Level 3000 Life Sciences electives, with at least three from one area of focus* Note that two of these five modules have to be: LSM3233 Developmental Biology, and LSM3252 Evolution and Comparative Genomics	20 [5]
6 [2]	Two additional Allied Science courses (can be completed with NUS Science modules)	-	-
-	-	Five Level 4000 Life Sciences electives, with at least three from one area of focus*	20 [5]
-	-	LSM4199 Honours Project in Life Sciences (complete in NUS)	16 [1]
Total Hours/Credits			
69 Hrs (92 MCs) [19 Courses]		**104 MCs [23 Modules]**	

*See Annex C for the acceptable UNC-CH course / NUS module mapping.

Annex C: Acceptable mapping of NUS Life Sciences modules and UNC-CH Biology courses

NUS		UNC-CH	
LSM1103	Biodiversity	BIOL 279-279L	Special Topics in Organismal Biology
LSM1303	Animal Behaviour	BIOL 278-278L	Animal Behavior
LSM2102	Molecular Biology	BIOL 434	Molecular Biology
LSM2202A	Experimental Molecular and Cell Biology	BIOL 535	Molecular Biology Techniques
LSM2241	Introductory Bioinformatics	BIOL 526	Computational Genetics
LSM2288	Basic UROPS in Life Sciences I	BIOL 295	Undergraduate Research in Biology
LSM3213	Molecular and Cellular Neurobiology	BIOL 450	Introduction to Neurobiology
LSM3214	Human Physiology: Hormones and Health	BIOL 436	Endocrinology
LSM3223	Immunology	BIOL 321	Introduction to Immunology
LSM3224	Molecular Basis of Human Diseases	BIOL 324	Molecular Basis of Disease
LSM3232	Microbiology	BIOL 422-422L	Microbiology
LSM3233	Developmental Biology	BIOL 443	Developmental Biology
LSM3241	Bioinformatics and Biocomputing	BIOL 525	Computational Analysis and Resources in Genomics
LSM3243	Molecular Biophysics	BIOL 431	Biological Physics
LSM3252	Evolution and Comparative Genomics	BIOL 471	Evolutionary Mechanisms
LSM3256	Tropical Horticulture	BIOL 273	Horticulture
LSM3261	Life Form and Function	BIOL 479-479L	Special Topics in Organismal Biology at an Advanced Level
LSM3262	Environmental Animal Physiology	BIOL 451-451L	Comparative Physiology
LSM3272	Global Change Ecology	BIOL 464	Global Change Ecology
LSM3288	Advanced UROPS in Life Sciences I	BIOL 395	Undergraduate Research
LSM4213	System Neurobiology	BIOL 455	Behavioral Neuroscience
LSM4232	Advanced Cell Biology	BIOL 448	Advanced Cell Biology
LSM4243	Tumour Biology	BIOL 445	Cancer Biology
LSM4252	Animal Reproduction	BIOL 441	Vertebrate Embryology
LSM4253	Behavioural Biology	BIOL 469	Behavioral Ecology
LSM4261	Marine Biology	BIOL 457	Marine Biology
LSM4262	Tropical Conservation Biology	BIOL 565	Conservation Biology
LSM4263	Field Studies in Biodiversity	BIOL 479-479L	Special Topics in Organismal Biology at an Advanced Level
LSM4266	Topics in Aquatic Biodiversity	BIOL 479-479L	Special Topics in Organismal Biology at an Advanced Level

Annex D

Schedule for Completion of NUS B.Sc. (Hons.) in Life Sciences – UNC-CH BS (Hons.) in Biology Joint Degree Programme

For NUS Life Sciences Major students

		NUS	UNC-CH
YEAR 1	1st Semester (Sem 1) & 2nd Semester (Sem 2)	LSM1101 Biochemistry of Biomolecules LSM1102 Molecular Genetics LSM1103 Biodiversity LSM1104 General Physiology CM1401 Chemistry for Life Sciences PC1421 Physics for Life Sciences **1** Singapore Studies module	
YEAR 2	3rd Semester (Sem 1)	LSM2101 Metabolism and Regulation LSM2102 Molecular Biology LSM2103 Cell Biology ST1232 Statistics for Life Sciences LSM2251 Ecology and Environment **1** Level 2000 LSM Experimental Elective (LSM2201A OR LSM2202A OR LSM2203)	
	4th Semester (Sem 2)		Approaches and Connections courses: **3** Social and Behavioural Sciences **3** Humanities and Fine Arts **1** North Atlantic World **1** Beyond the North Atlantic World **1** World before 1750 **1** Global Issues
YEAR 3	5th Semester (Sem 1)		
	6th Semester (Sem 2)	**5** Level 3000 Life Sciences Electives Note that two of these five modules have to be: LSM3233 Developmental Biology, and LSM3252 Evolution and Comparative Genomics	
YEAR 4	7th Semester (Sem 1) & 8th Semester (Sem 2)	**5** Level 4000 Life Sciences Electives LSM4199 Honours Project in Life Sciences	

Annex E

Schedule for Completion of NUS B.Sc. (Hons.) in Life Sciences – UNC-CH BS (Hons.) in Biology Joint Degree Programme

For UNC-CH Biology Major students

		NUS	UNC-CH
YEAR 1	1st Semester (Sem 1) & 2nd Semester (Sem 2)		ENGL 105 **Up to 3** Foreign Language Courses CHEM 101-101L, 102-102L. MATH 231 BIOL 101-101L Approaches and Connections courses
YEAR 2	3rd Semester (Sem 1) & 4th Semester (Sem 2)		CHEM 241-241L, 261, 262-262L. MATH 232 or other Quantitative Intensive course BIOL 201 Ecology and Evolution BIOL 202 Molecular Biology and Genetics BIOL 205 Cellular and Developmental Biology Approaches and Connections courses
YEAR 3	5th Semester (Sem 1) & 6th Semester (Sem 2)	LSM1103 Biodiversity (equivalent **1** BIOL 200 Organismal Biology Course) **4** Level 1000-4000 LSM modules (approved NUS equivalents) [Note two modules must be Level 3000 or above] CM1121 and CM2121 [For students who have not taken CHEM 261, 262-262L; students should take both or neither as one alone will not be counted.] **2** additional Allied Science courses (approved NUS Science modules) Approaches and Connections courses (approved NUS modules)	
YEAR 4	7th Semester (Sem 1) & 8th Semester (Sem 2)		BIOL 395 Undergraduate Research and BIOL 691H Senior Honors Thesis (for Honours class) (PHYS 104 & 105) or (PHYS 116 & 117) Remaining Approaches and Connections courses

Approaches and Connections courses:
3 Social and Behavioural Sciences
3 Humanities and Fine Arts
1 US Diversity
1 North Atlantic World
1 Beyond the North Atlantic World
1 World before 1750
1 Global Issues