

APPROVED BY SENATE
10/19/2020

: INTEGRATIVE BIOLOGY, MS

In Workflow

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11. Board of Trustees (none)
12. IBHE (none)
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Approval Path

1. Wed, 10 Jun 2020 22:00:00 GMT
Deb Forgacs (dforgacs): Approved for U Program Review
2. Thu, 11 Jun 2020 19:42:02 GMT
Stephen Downie (sdownie): Approved for 1383 Head
3. Thu, 11 Jun 2020 19:54:33 GMT
Stephen Downie (sdownie): Approved for SIB Head
4. Thu, 11 Jun 2020 20:06:59 GMT
Kelly Ritter (ritterk): Approved for KV Dean
5. Fri, 12 Jun 2020 03:34:05 GMT
John Wilkin (jpwilkin): Approved for University Librarian
6. Thu, 17 Sep 2020 19:50:28 GMT
Allison McKinney (agrindly): Approved for Grad_College
7. Thu, 17 Sep 2020 20:26:29 GMT
Kathy Martensen (kmartens): Approved for Provost
8. Fri, 18 Sep 2020 21:25:37 GMT
Kathy Martensen (kmartens): Rollback to KV Dean for Senate EPC
9. Wed, 23 Sep 2020 16:11:07 GMT
Amy Elli (amyelli): Approved for KV Dean
10. Wed, 23 Sep 2020 16:23:04 GMT
John Wilkin (jpwilkin): Approved for University Librarian
11. Wed, 23 Sep 2020 19:18:30 GMT
Allison McKinney (agrindly): Approved for Grad_College
12. Wed, 23 Sep 2020 20:28:06 GMT
Kathy Martensen (kmartens): Approved for Provost

New Proposal

Date Submitted: Wed, 10 Jun 2020 14:42:24 GMT

Viewing:: Integrative Biology, MS

Changes proposed by: Kelly Ritter

Proposal Type

Proposal Type:

Major (ex. Special Education)

Proposal Title:

If this proposal is one piece of a multi-element change please include the other impacted programs here. *example: A BS revision with multiple concentration revisions*

Establish a Master of Science in Integrative Biology (MS in IB) in the School of Integrative Biology

EP Control Number

EP.21.017

Official Program Name

Integrative Biology, MS

Effective Catalog Term

Fall 2021

Sponsor College

Liberal Arts & Sciences

Sponsor Department

Integrative Biology

Sponsor Name

Stephen R. Downie

Sponsor Email

sdownie@illinois.edu

College Contact

Kelly Ritter

College Contact Email

ritterk@illinois.edu

Program Description and Justification

Provide *abrief* description and justification of the program, including highlights of the program objectives, and the careers, occupations, or further educational opportunities for which the program will prepare graduates, when appropriate.

We propose to develop and deliver a non-thesis, course-based Master of Science degree program in Integrative Biology (MS in IB). This proposal is similar in structure to a recently approved MS degree program in the School of Molecular and Cellular Biology. This MS in IB degree program will

include both face-to-face and online course options and would be directed toward students who want advanced preparation for professional school or future careers in industry, government or academia. Additionally, with Covid-19 increasing the need for online courses, we are currently continuing the development of many of our advanced courses and could soon offer large portions of this degree program online. The purpose of this degree program is to provide an educational option for advanced study in the field of integrative biology without requiring a research thesis component.

This proposed degree program would allow students who have completed their BS at Illinois and elsewhere to attain a post-baccalaureate degree through rigorous coursework and advisement core-courses. School of Integrative Biology graduate students currently have the ability to complete a traditional, thesis-based MS degree in each of our individual departments (Evolution, Ecology and Behavior; Entomology; Plant Biology) and interdisciplinary graduate programs (e.g., Program in Ecology, Evolution, and Conservation Biology), but there exists no opportunity for Illinois students or those who have obtained their undergraduate degrees elsewhere to attain a MS degree from the School of Integrative Biology.

We anticipate that this new program will primarily serve students who are graduating with a BS from IB and are seeking further support in developing next steps in their careers. From the most recent exit surveys of our graduating classes, we know that 20% of our seniors take a gap year prior to entering professional school or a PhD program. An additional 30% of our students indicate that they are seeking employment in industry, government or non-governmental organizations. This equates to roughly half of our graduating students who do not have firm plans for their post-baccalaureate year. A MS degree, with an additional year of advanced-level coursework in areas such as bioinformatics and genomics, will afford an opportunity to these students to gain a higher education degree, thus making them more competitive for placement. Students will also take advanced laboratory coursework as part of the degree, helping to develop skills in high demand in research, industry, and professional schools.

This MS degree will help students to stand out more from their peers when they do apply for either additional graduate/professional schools or employment. The taking of rigorous, lab-based coursework can help students to refine their laboratory skills and better understand their interests, thus helping them to improve their applications. Students will also benefit from the opportunity to improve their GPAs before applying to additional degree programs. As we do plan to serve students taking a gap year, the MS in IB degree is comprised of courses that could be completed in a one-year scenario, allowing students to complete the MS degree in 2-3 semesters, in place of the traditional 4 semesters of coursework. Thus, this new degree program will fill a current void whereby our students currently do not have the option to use this gap year to seek a degree here in IB.

Corresponding Degree

MS Master of Science

Is this program interdisciplinary?

No

Academic Level

Graduate

Will you admit to the concentration directly?

No

Is a concentration required for graduation?

No

CIP Code

260102 - Biomedical Sciences, General.

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Institutional Context

University of Illinois at Urbana-Champaign

Describe the historical and university context of the program's development. Include a short summary of any existing program(s) upon which this program will be built.

Explain the nature and degree of overlap with existing programs and, if such overlap exists, document consultation with the impacted program's home department(s).

The former School of Life Sciences offered a non-thesis, course-based MS degree program. When the Schools of IB and MCB were created, the MS in Biology program was gradually phased out. A non-thesis, course-based MS in MCB degree program has recently been approved. A non-thesis, course-based MS in IB degree program is not currently available, and we see demand for such a program. There is no degree overlap with existing programs.

University of Illinois

Briefly describe how this program will support the University's mission, focus and/or current priorities. Demonstrate the program's consistency with and centrality to that mission.

As part of the University's mission in using transformative learning experiences to help shape the pre-eminent leaders at local, national, and global levels, this program would serve students by opening up alternative pathways to advance their knowledge, achievements, and leadership skills. By creating opportunities for students to use a gap year meaningfully in honing their laboratory and data analytics skills, we will better prepare these students to be the best at what they want to be. No such opportunity currently exists for students who are looking to complete a non-thesis MS degree in IB. An advanced degree of this type would be beneficial to these students by better preparing them for jobs in industry, governmental, and non-governmental organizations. Also, students in a gap-year scenario often take advantage of post-baccalaureate programs to increase GPA and/or experience before applying to professional school, yet often times these programs do not necessarily end in a degree. With this IB degree program, students will be able to take advantage of both and leave with a degree from a world-renowned research institution. We also see this program as enhancing their earning potential while helping them to further develop key aspects of success including critical thinking and interpersonal skills. Thus, this MS program will help to train more highly qualified students who will enter the workforce better prepared to lead.

As for specifics of how this program's objectives correlate with our University's mission on creating pre-eminent scholars, this program in its entirety would serve to facilitate skills in our students that are most commonly found among those who are successful in the fields of science, such as curiosity, grit, optimism, critical-thinking, self-control, interpersonal skills, and gratitude. This program would be skill-building for these students by supplying them with courses which can help to better engage with their interests. With access to these upper-level courses on specific areas of biology including organismal biology, behavioral ecology, and programming for genomics (to name a few) students will better explore their curiosities and passions related to developing their careers in science. By allowing for more intense and specified training in laboratory practices from courses such as bioinformatics, this degree program will help students to gain skills such as perseverance and analytical thinking which are valued by many companies on the forefronts of the biotech industry. Lastly, in honing their skills on interpersonal communication, this program would better prepare students to critically analyze and communicate peer-reviewed, primary scientific literature.

State of Illinois

Indicate which of the following goals of the Illinois Board of Higher Education's Strategic Initiative are supported by this program: (choose all that apply)

Educational Attainment - increase educational attainment to match the best-performing states.

High Quality Credentials to Meet Economic Demand - Increase the number of high-quality post-secondary credentials to meet the demands of the economy and an increasingly global society.

Integration of Educational, Research and Innovation Assets - Better integrate Illinois' educational, research and innovation assets to meet economic needs of the state and its regions.

Describe how the proposed program supports these goals.

This new degree program would both serve to increase educational attainment here in Illinois while also meeting demand for high-quality credentials by affording students an opportunity to employ an otherwise non-degree attaining gap-year in a more advantageous way. With our ability to offer large portions, if not all program courses online by 2022, we are also meeting the immediate demands of online learning due to Covid-19. Students leaving the IB program with a BS degree are put into a wide applicant pool, often needing advanced degrees, lab skills, and work experiences to stand out. With this program, our students would enter these fields with competitive advantage. This program serves to integrate educational, research and innovation assets by allowing better connections to be forged with opportunities present at the University of Illinois as well as with our extensive IB alumni network, as outlined below in our IB 492 course, a requirement for all MS in IB students.

Admission Requirements

Desired Effective Admissions Term

Fall 2021

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.

Students entering the MS in IB program will be expected to have a completed Bachelor's degree from an accredited 4-year college or university with undergraduate coursework in biology, chemistry, physics, calculus and English composition. Applicants must have completed the last 60 hours of coursework with grades of B (3.0 on a scale of 1 to 4) or better. Deficiencies in these areas will require additional coursework, as necessary, for successful completion of the degree.

Describe how critical academic functions such as admissions and student advising are managed.

We currently have an Instructor ready to take on the directorship of the MS in IB program. This person will coordinate admissions and advise students in the program. She will also participate in delivering the IB 492 course which serves as an added layer of advisement support for these students. The director of the MS in IB program will report to the Associate Director of Academic Affairs in IB.

Enrollment

Number of Students in Program (estimate)

Year One Estimate

5

5th Year Estimate (or when fully implemented)

30

Estimated Annual Number of Degrees Awarded

Year One Estimate

5

5th Year Estimate (or when fully implemented)

25

What is the matriculation term for this program?

Fall

What is the typical time to completion of this program?

1 year

What are the minimum Total Credit Hours required for this program?

32

Delivery Method

This program is available:

On Campus

Budget

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?

No

Additional Budget Information

As this proposed degree program is intended to be self-supporting, we do not intend to use tuition waivers in this program. We anticipate that most students in this program would be completing this degree in only 1-year, thus we do not foresee that students would be able to handle a full-time course load on top of a teaching assistantship. Thus, we anticipate the majority of these students will be paying tuition as full-time students.

In addressing the lack of diversity often seen in STEM fields, we have an intent to offer some financial support to under-represented minorities after the program is in place for three years and is financially stable.

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?

No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

As we have capacity in all of our upper-level courses, we do not expect the need to add seats to any course in order to serve students in this program. Additionally, we propose to cap this program at 30 students enrolled at any one time. These 30 students would then be spread across over 50 upper-level courses across multiple semesters. Thus, we do not see a need to increase the numbers of faculty or TAs as essentially these seats are already being paid for in the current costs of the courses. We recently hired an additional specialized faculty member who will assist in directing the MS in IB graduate program and in the teaching of several courses.

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

No impact on the library is expected with this degree program.

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does this new program/proposed change result in the replacement of another program?

No

Does the program include other courses/subjects impacted by the creation/revision of this program?

No

Financial Resources

How does the unit intend to financially support this proposal?

We have the capacity to enroll additional students in all of our upper-level courses (46 400-level courses and 12 500-level courses), thus we will not be seeking additional support for this proposal. In addition, we offer an Online Master of Science Teaching (OMST) Biology Program designed to give practicing teachers the opportunity to earn a MS degree in Teaching of Biological Science. OMST courses in evolution, sustainability, genomics, bioinformatics, and emerging infectious diseases will be converted for a general audience to provide additional opportunities for 500-level coursework.

Will the unit need to seek campus or other external resources?

No

Attach letters of support

MS in IB SS Form.pdf

Are you seeking a change in the tuition rate or differential for this program?

Yes

Is this program requesting self-supporting status?

Yes

If this program requires a tuition or differential change, have your college budget officer contact provostbudget@illinois.edu for next steps.

If yes, please explain

As this proposed degree program is intended to be self-supporting, we do not intend to use tuition waivers in this program. We anticipate that most students in this program would be completing this degree in only 1-year, thus we do not foresee that students would be able to handle a full-time course load on top of a teaching assistantship. Thus, we anticipate the majority of these students will be paying tuition as full-time students.

We plan to use the existing tuition rates, with AY 20/21 IL resident tuition set at \$17,914 (or \$746/credit hour for 12+ hrs). The School of Integrative Biology will be responsible for all costs, and will receive 70% of the gross tuition with 30% of the gross income to go to the College of LAS (an agreement is in place with the LAS Dean's office). This program is expected to add few students to begin, but should still be revenue positive within the first five years as our program costs are very low as outlined.

In addressing the lack of diversity often seen in STEM fields, we have an intent to offer some financial support to under-represented minorities after the program is in place for three years and is financially stable.

Market Demand

What market indicators are driving this proposal? If similar programs exist in the state, describe how this program offers a unique opportunity for students:

An earlier non-thesis MS in Biology degree enrolled ~30 students per year, so we are confident there is demand for the non-thesis MS program. (The MS in Biology program was created in the old School of Life Sciences over thirty years ago and officially started phasing out when the Schools of IB and MCB were created.) This, combined with data from our Senior Surveys on gap year plans, indicates that students have interest in allowing themselves a year to improve their applications for further advanced study (i.e., a PhD program or medical school). Again, the Covid-19 pandemic is increasing demand for online instruction and this degree program beginning in Fall 2021 may very well see all required courses online if our social distance policies continue into Fall 2020.

Within Big Ten schools, similar programs exist in only a few near-by universities comparable to Illinois (University of Michigan and University of Wisconsin), but many institutions within the state of Illinois do not offer a non-thesis MS degree option in Integrative Biology. Thus, this program would offer an opportunity to stay competitive within Big Ten schools, while also being a leader here in Illinois by being the first public university to offer such a degree program.

What type of employment outlook should these graduates expect? Explain how the program will meet the needs of regional and state employers, including any state agencies, industries, research centers, or other educational institutions that expressly encourage the program's development.

According to the Bureau of Labor Statistics (2020) demand for occupations in Life, Physical, and Social Sciences is projected to increase by 7% through 2026, a rate faster than average for all occupations. A non-thesis MS program in IB would be a boon for our students in terms of strengthening their skill sets for applications to professional school and/or other employment opportunities. In addition, IB coursework is known to industry as a program that develops strong laboratory skills. These MS students would also be afforded contacts within the Graduate Career Development Office which would further their connections with employers and help students to envision and seek-out more meaningful and applicable employment to their skill sets.

What resources will be provided to assist students with job placement?

As part of the MS in IB program, students will take a course, IB 492, which will include more tailored mentoring, similar to a current course we offer to undergraduates through our IB Alumni Mentoring Program (IB 292; Translating Your IB Degree into Career Success). Through the analyses of IB 292 student evaluations, we learned that students found statistically significant gains in confidence to find and secure a career, to be able to make connections in their field, and to apply resources learned to aid in their job searches and applications. IB 492 will similarly serve to connect students with IB alumni and mentors in helping them to better plan their next steps and career growth through connections with our community here at Illinois. These connections could specifically benefit students in the MS in IB program by helping to develop volunteer and mentoring opportunities which would create a more well-rounded application to professional schools or employment opportunities. IB 492 will also serve to help students make informed decisions about the next steps in their career development along with building skill sets such as how to interpret scientific literature effectively, how to construct successful grant proposals, and the methods of successful scientific writing.

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

Learning Outcomes for the MS in IB Program:

1. Synthesize and apply core knowledge in interdisciplinary biological fields including anatomy, biochemistry, development, ecology, evolution, genetics, molecular biology, physiology, and/or systematics.
2. Apply predictive models to biological phenomena and engage with the process of scientific inquiry.
3. Critically evaluate and communicate complex, dynamic scientific information.
4. Employ curiosity, inquiry, quantitative reasoning, and critical thinking in problem solving.
5. Show leadership in using interdisciplinary strategies to solve global and local biological challenges.
6. Develop professional skills including ethics, proficiency in scientific writing and speaking, collaboration, and effective communication.

To assess and improve student learning, we will continue to provide learning outcomes in each course syllabus, and have instructors refer to them throughout the semester so students are aware of what they will be learning and why. Instructors will also provide an anonymous, mid-semester, student evaluation of each course. SIB courses also include a variety of formative and summative assessments in each course, with the latter including final exams, end-of-class projects, and written reports. We will employ ICES Online to provide an end-of-semester course/instructor evaluation. To better support students as they move through the program, we will meet individually with each student to review their progression through the program, any issues they might be experiencing with their courses, and to discuss whether they are achieving their learning and career goals. We also will provide an exit survey to all students graduating from the program to inquire about post-graduate destinations, whether the program prepared them adequately for these destinations, and their perception of the success of the program. Lastly, we will follow-up with alums of the program at 2 and 5-year intervals after graduation to determine placement rates into other academic programs or careers, their reflections on the knowledge and skills they have learned in the program, and how the program's learning outcomes prepared them for where they are now.

The director of the MS in IB program will lead all program assessment work. An annual summary report will include a report of all assessment activities undertaken, as well as review enrollment information, course progression, and time to degree completion. Assessment information will be shared with the SIB Associate Director of Academic Affairs, other members of the School's Executive Committee, the faculty instructors, the Alumni

Mentoring Coordinator, and with the broader SIB faculty during the unit's annual meeting. Based on results of the assessment work, course curricula may be revised, learning outcomes modified, and student advising improved.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: <https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf>). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

For new programs, attach Program of Study

MS in IB appendix--courses.docx

MS in IB requirements table.docx

Catalog Page Text

Catalog Page Text: Description of program for the catalog page. This is not official content, it is used to help build the catalog pages for the program. Can be edited in the catalog by the college or department.

Overview tab:

The Master of Science in Integrative Biology (MS in IB) provides students with a non-thesis, course-based advanced degree program opportunity. Students in the MS program have the ability to enhance their skill sets within IB upper-level courses through our world-class educational experiences, without having to invest in a required and timely research component for the degree. Students will thus be able to graduate in one year with a degree making them more competitive for employment and future research opportunities.

This program mainly serves students who are in a gap year between undergraduate programs and either employment or future graduate-level programs. With the ability to hone skills in critical thinking, communication, laboratory practices, and scientific knowledge this program affords students the ability to make effective use out of such a year.

The MS in IB program offers advanced coursework in fields such as organismal biology, behavioral ecology, anatomy and physiology, environmental science, bioinformatics, pathology, genomics, and mathematical modeling to name just a few. With a world-class advanced degree from the University of Illinois, our students are better prepared to enter the workforce and thus have higher earning potential.

Catalog Page Text: The MS in IB program degree requires a minimum of two full-time semesters. Students may take up to two years to complete their degree. See approved course list at: <http://sib.illinois.edu/graduate/programs>.

For additional details and requirements refer to the MS in SIB Program Handbook and the Graduate College Handbook-<https://grad.illinois.edu/handbooks-policies>.

Statement for Programs of Study Catalog

Code	Title	Hours
Core Curriculum Hours Required		12-24
At least one course from two of the following three IB disciplinary areas and one additional course with a laboratory and/or field component. See link above for course list. ¹		
Area 1: Organismal and Evolutionary Biology		
Area 2: Behavior, Ecology and the Environment		
Area 3: Integrative anatomy, Physiology and Molecular Biology		
Elective Hours Required		6-8
Courses to be chosen from the MS in IB approved list of courses- see link above- or upon approval from the program director.		
Minimum 500-level Hours Required		12
Courses to be chosen from the MS in IB approved list of courses- see link above.		
Total Hours Required		32

Other Requirements:

¹ *Two hours must come from IB 492.*

Required Courses:	Required Hours
Minimum Hours Required Within the Unit	8
Minimum GPA	3.0
Maximum hours of IB 590 allowed to count toward the MS in IB degree	6

EP Documentation

DMI Documentation

Program Reviewer Comments

Kathy Martensen (kmartens) (Fri, 18 Sep 2020 21:25:37 GMT):Rollback: Rolling back from Senate EPC: Please add the elective hour options that are outlined in the appendix to the actual Program of Study table.

Kathy Martensen (kmartens) (Thu, 01 Oct 2020 20:36:34 GMT):Email exchange between subcommittee chair and Stephen Downie, IB: Dr. Downie states the school is in the process of building a website for the MS in IB, which is where the list of available courses each semester, prior to graduate student registration, will be maintained. This will be linked to the Program of Study in the Academic Catalog, similar to what the MS in MCB is doing now.

Key: 966



GRADUATE COLLEGE

110 Coble Hall, MC-322
801 S. Wright St.
Champaign, IL 61820

PROGRAM TUITION WAIVER POLICY PROPOSAL

Proposals to establish or revise tuition waiver policy for a graduate program will follow a shared governance approval process (Department, School, College, Graduate College).

Definitions of Tuition Waiver Policy Designations:

Traditional Programs. Programs either designated as generating **full or base-rate** tuition waivers. Base rate waivers waives only the Resident Graduate Base tuition amount. Non-Residents or students in a program with an additional tuition differential will be responsible for the remaining portion of tuition.

Reimbursable Programs. Programs identified as programs that would be reimbursed from an appointing unit outside their academic college.

Cost-recovery and self-supporting programs. Students in approved cost-recovery and self-supporting programs are not eligible to receive tuition and fee waivers except statutory waivers. Students in these programs are not eligible to hold a waiver generating graduate appointment (Assistantship or Fellowship). Full time employees may be admitted to these programs, but their employee waiver is not eligible for use towards a program with this designation.

Additional information related to these tuition waiver designations can be found here:
<http://www.grad.illinois.edu/gradhandbook/2/chapter7/tuition-waivers#otherprovisions>.

PROGRAM INFORMATION

COLLEGE OR SCHOOL: _____

PROGRAM(s) (Include Program Codes if applicable): _____

REQUESTED DESIGNATION (Select desired designation type):

Comments:

JUSTIFICATION: On a separate sheet, please address the following.

1. Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.
2. What type of financial assistance will be offered to students in the program?
3. Has this program had past practice of offering graduate assistantships? If so, please describe.
4. What provisions will be made to communicate the new classification to prospective and newly admitted students?

APPROVALS: (May use Adobe Signature or print and sign the document)

Department Executive Officer Signature and Date: Stephen Downie 7/28/20

Disciplinary College Signature and Date: [Signature] 9/14/20

Graduate College Signature and Date: _____



MS in IB Program Tuition Waiver Policy Proposal Questions

1. Describe the reasons for this request and explain: (a) the pros and cons of the classification requested, and (b) how the requested classification will benefit and not adversely affect the academic quality of the program.

This request is to establish a course-based Master of Science in Integrative Biology degree program. As this proposed degree program is intended to be self-supporting and thus not designed for assistantships, we do not intend to use tuition waivers in this program. We anticipate that most students in this program would be completing this degree in only 1-year, thus we do not foresee that students would be able to handle a full-time course load on top of a teaching assistantship. Thus, we anticipate the majority of these students will be paying tuition as full-time students.

a) While we can understand that full tuition costs will be cost-prohibitive for some students desiring to enter this program, we are mindful of the time constraints of a one-year program such as the one we are proposing. We anticipate that this new program will primarily serve students who are graduating with a BS from IB and are seeking further support in developing next steps in their careers. From the most recent exit surveys of our graduating classes, we know that 20% of our seniors take a gap year prior to entering professional school or a PhD program. An additional 30% of our students indicate that they are seeking employment in industry, government or non-governmental organizations. This equates to roughly half of our graduating students who do not have firm plans for their post-baccalaureate year. A one-year MS degree, with an additional year of advanced-level coursework in areas such as bioinformatics and genomics, will afford an opportunity to these students to gain a higher education degree, thus making them more competitive for placement.

B) We do not foresee this self-supporting model to adversely affect the academic quality of the program as we currently have space available currently in these graduate level courses for incoming students. Additionally, these incoming students will help in our plans to deliver current IB 500-level courses from the Online Master of Science Teaching (OMST) program to a wider audience.

2. What type of financial assistance will be offered to students in the program?

In addressing the lack of diversity often seen in STEM fields, we have an intent to offer some financial support to under-represented minorities after the program is in place for three years and is financially stable.

Students will also be eligible for standard financial aid resources through the Graduate College.

3. Has this program had past practice of offering graduate assistantships? If so, please describe.

As this is a new program, we have not had such practice.

4. What provisions will be made to communicate the new classification to prospective and newly admitted students?

The program will be linked to from the School of Integrative Biology webpage, which will contain clear information that this is a self-supporting program and thus students are not eligible for tuition waivers. Additionally, once accepted into the program, the letter of admittance will state the same. Students in the program will also initially meet with the MS in IB Program Director who will define this self-supporting model to the students. The director of the MS in IB program will report to the Associate Director of Academic Affairs in IB.

Appendix A:
Master of Science Degree in Integrative Biology
(Course-based MS Program)
MS in IB Approved List of Courses*

*Other courses may be available. See MS in IB Program Director for review of request.

Core Curriculum Hours Required: 12-14

Course selection must include at least 12 hours from **two of the following three disciplinary areas** of Integrative Biology. **Elective Hours Required (6-8)** may also be filled from this list as well as from the Additional Advanced Courses list below.

Area 1: Organismal and Evolutionary Biology

- IB 401: Introduction to Entomology (3 or 4 hr, the latter with insect collection)
- IB 461: Ornithology (4 hr)
- IB 462: Mammalogy (4 hr)
- IB 463: Ichthyology (4 hr)
- IB 471: General Mycology (4 hr)

Area 2: Behavior, Ecology and the Environment

- IB 405: Ecological Genetics (3 hr)
- IB 430: Animal Behavior Lab (3 hr)
- IB 431: Behavioral Ecology (3 hr)
- IB 432: Genes and Behavior (3 hr)
- IB 439: Biogeography (3 hr)
- IB 440: Plants and Global Change (3 hr)
- IB 443: Evolutionary Ecology (3 hr)
- IB 444: Insect Ecology (3 or 4 hr, the latter with laboratory)
- IB 451: Conservation Biology (4 hr)
- IB 452: Ecosystem Ecology (3 hr)
- IB 453: Community Ecology (3 hr)
- IB 481: Vector-borne Diseases (4 hr)
- IB 482: Insect Pest Management (3 hr)
- IB 485: Environmental Toxicology and Health (3 hr)
- IB 486: Pesticide Toxicology (3 or 4 hr, the latter with project)
- IB 494: Theoretical Biology and Models (4 hr)

Area 3: Integrative Anatomy, Physiology and Molecular Biology

- IB 420: Plant Physiology (3 hr)
- IB 421: Photosynthesis (3 hr)
- IB 426: Environmental and Evolutionary Physiology of Animals (3 hr)
- IB 427: Insect Physiology (4 hr)
- IB 434: Physical Principles of Biology (3 hr)

IB 435: Critical Evaluation of Herbal Remedies (3 hr)
IB 472: Plant Molecular Biology (1 hr)
IB 473: Plant Genomics (1 hr)

Additional Advanced Courses: Required Elective Hours (6-8) can be filled from this list or from the three areas listed above.

IB 411 ONL: Bioinspiration (3 hr)
IB 416: Population Genetics (3 or 4 hr, the latter with project)
IB 442: Evolution of Infectious Diseases (3 hr)
IB 447: Field Ecology (1 hr)
IB 450: Stream Ecology (3 or 4 hr, the latter with project)
IB 464: Herpetology (4 hr)
IB 467: Principles of Systematics (4 hr)
IB 468: Insect Classification and Evolution (4 hr)
IB 476: Applied GIS to Environmental Studies (3 hr)
IB 478: Advanced Plant Genetics (3 hr)
IB 483 ONL: Insect Pathology (3 hr)
IB 484: Paleoclimatology (4 hr)
IB 487: Math Modeling in Life Sciences (3 or 4 hr, the latter with project)
IB 491: Biological Modeling (3 or 4 hr, the latter with project)
IB 492: Science Communication Skills (2 hr)
IB 496: Special Courses (1-5 hrs)

500-level Courses Required: A minimum of 12 hours

IB 501: Programming for Genomics (4 hr)
IB 502: Biological Networks (2 hr)
IB 504: Genomic Analysis of Insects (3 hr)
IB 505: Bioinformatics and Systems Biology (4 hr)
IB 506: Applied Bioinformatics (4 hr)
IB 512: Plant Metabolomics (2 hr)
IB 513: Discussions in Plant Physiology (1 hr)
IB 516: Ecosystem Biogeochemistry (4 hr)
IB 526: Seminar in Entomology (1 hr)
IB 542: Environmental Plant Physiology (4 hr)
IB 546: Topics in Ecology and Evolution (1 hr)
IB 590: Individual Topics (2-6 hr)

Online Master of Science Teaching of Biology Program Courses†

IB 531 ONL: Emerging Infectious Diseases (4 hr)
IB 532 ONL: Sustainability and Global Change (4 hr)
IB 533 ONL: Human Genome and Bioinformatics (4 hr)
IB 534 ONL: Evolution and Medicine (4 hr)
IB 535 ONL: Biology and Tech Innovation (4 hr)
IB 536 ONL: Evolutionary Biology (4 hr)

† OMST of Biology courses are designed explicitly for biology teachers and will be redeveloped to be more suitable for IB graduate students. Currently, offered various terms and one course per summer.

Master of Science Integrative Biology requirements

Core Curriculum Hours Required	12-14
At least one course from two of the following three IB disciplinary areas and one additional course with a laboratory and/or field component. Two hours must come from IB 492.	
Area 1: Organismal and Evolutionary Biology	
Area 2: Behavior, Ecology and the Environment	
Area 3: Integrative anatomy, Physiology and Molecular Biology	
Elective Hours Required	6-8
Courses to be chosen from the MS in IB Approved List of Courses or upon approval from the program director.	
Minimum 500-level Hours Required	12
Courses to be chosen from the MS in IB Approved List of Courses.	
Total Hours Required	32

Other Requirements

Minimum Hours Required Within the Unit: 8 hours

Minimum GPA: 3.0

A maximum of 6 hours of IB 590 are allowed to count toward the MS in IB degree.

For additional details and requirements, refer to the MS in IB Program Handbook and Website and the Graduate College Handbook.