Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: Romance Studies DATE SUBMITTED: 11/6/2019

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

Graduate Certificate in Teaching Language, Literature, & Film

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

BOSTON UNIVERSITY

Office of the Provost

Proposed New Degree or Credit-Bearing Certificate: Academic Component

NOTE: The Library Impact Statement is required for the review of a new degree program. Proposers should contact the Library as early in the proposal development process as possible.

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Title of Degree or Credit-Bearing Certificate (e.g., Bachelor of Arts in History):

Graduate Certificate in Teaching Language, Literature, & Film

Proposing/Supporting Department:

Romance Studies (Graduate School of Arts & Sciences)

Proposed Start Date:

September 1, 2020

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Dorothy Kelly
Director of Graduate Studies, Romance Studies
djkelly@bu.edu
617-353-6213

2. Please briefly describe the proposed new degree:

This certificate will provide doctoral students in Romance Studies (French Language & Literature; Hispanic Language & Literatures) with training in the teaching of French / Hispanic

language, literature, and film. Training will be provided through graduate level subject-matter courses on literature and film, pedagogy seminars, and actual teaching of undergraduate courses (with guidance and support from faculty).

3. Please provide a rationale for the proposed new degree:

In line with the 2014 report of the MLA task force on Doctoral study in Modern Language and Literature and their recommendations for graduate programs, we believe that a certificate in teaching language, literature, and film/visual culture will give our graduate students key professional training and an additional advantage when they go on the job market.

4. Please describe how the proposed new degree advances the Strategic Plans of the department, school/college, and University:

- This certificate program advances one of the goals of the BU Strategic Plan: "Professional graduate education is the stepping-stone in today's fast-paced professional world. We are committed to offering leading programs that help our students compete effectively using both traditional classroom instruction and game-changing digital offerings."

  This certificate does so by providing crucial professional training for our PhD students that will help them compete effectively in their search for employment and to succeed in their jobs as teachers.

- This program advances the strategic plans of the Graduate School of Arts and Sciences: "Our doctoral students need the opportunity to pursue professional development as well, as set out in the 2010 strategic plan. We may identify other areas in which to improve support, from writing, conference presentation, and publication to interviewing and language improvement for international students who would benefit from it. We will look for ways to improve our students' preparation for the academic job market."

  The Certificate in Pedagogy provides specific professional development, such as preparing conference presentations and interviewing. It will also make visible the extensive training in teaching that our students already receive.

  "The 2010 plan recognized that not all PhD recipients will enter the professoriate and that 'an increasing number of professional positions demand the advanced knowledge, research skills, and experience that a doctoral education provides.' We can do more to prepare our students for jobs outside of academia (so-called alternative-academic or

"alt-ac" careers). For example, just as we have started providing on-campus internships to CAS undergraduates, there may be similar opportunities that could be offered to graduate students to help them build professional skills, experience, and connections."

This certificate prepares our students for teaching at all levels.

5. Please list the program requirements for the proposed new degree (denote new courses in bold print and courses already approved for conveying Hub units with an asterisk). Please include total credits, specific courses, and any additional degree requirements. New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf:

The requirements for the certificate in Teaching Language, Literature, and Film are:

- Successfully complete the 4-credit LF/LS 850 graduate seminar on literary theory and seven approved 4-credit courses in the appropriate program, Spanish or French PhD.
- Successfully complete at least one graduate course in the relevant literature (Spanish or French) and at least one graduate course on film. Below is a list of approved film courses:
    - CAS LF 586 Narrative Film
    - CAS LF 569 Algeria in Words & Images
    - CAS LS 579 Hispanic Cinema
    - CAS LS 580 Mexico City in Literature & Film
    - CAS LS 581 The Mexican Revolution Revisited
    - Any CIMS Graduate Level Film Course
    - The Romance Studies Director of Graduate Studies may also approve other film courses on a case by case basis.
- Teach French/Spanish courses in the Romance Studies Department for four semesters (4 courses).
- Successfully complete LL690, a four-credit seminar and methods course, geared on the one hand to standards- and proficiency-based instruction, diverse practices for foreign language instruction, assessment, and the development of effective lesson plans in preparation for the student's first semester of teaching.
- Successfully complete LL691A, a two-credit teaching practicum seminar that fosters a professional outlook on language teaching and learning while applying course content from LL690 to the first-year teaching experience.
- Successfully complete LL691B, a two-credit seminar on professional development for literature/film and language instructors, which would include preparation of CVs,

mock interviews, and other preparation for the job search, as well as examples of teaching performance and materials, such as video clips of class, syllabi.

- Create a teaching/research portfolio to be reviewed by a committee of faculty members.

6. Please list program learning outcomes: [http://www.bu.edu/provost/planning/program-learning-outcomes-assessment/]

1. Students will be prepared to teach French or Spanish language, literature, and film classes at all undergraduate levels and at graduate levels.
2. Students will understand key concepts of second-language acquisition theory and practice
3. Students will be able to articulate – for example, to prospective employers – their knowledge of the teaching of language, literature, and film, as well as their principles and practices in the field of language teaching.
4. Students will be able to describe their research and its importance to the field

7. For master's or professional doctorate degrees, please describe what this program prepares students for after they have graduated:

N/A

8. Please describe how the proposed new degree relates to existing programs at the University: [*Please upload cognate letters separately*.]

This certificate will be analogous to the existing Teaching Writing Certificate offered by the CAS Writing Center. Similar to that certificate, it will be an optional 'value-added' program that will provide doctoral students with rigorous training in pedagogical skills valued by prospective employers.

9. Please place the proposed program in the context of comparable programs at appropriate peer institutions (AAU peer institutions and disciplinary peers):

The following is a list of several peer institutions with pedagogy certificates, some specific to second-language teaching and some more general:

Harvard: The Bok Certificate in Teaching Language and Culture

In collaboration with the Department of Romance Languages and Literatures, the Derek Bok Center for Teaching and Learning offers a certificate program through which graduate students may demonstrate their commitment to excellence in the teaching of language(s) and culture(s). The certificate is open to graduate students who teach courses in language, culture, and literature in Harvard College. The certificate requirements include 1) teaching, 2) research and practice, and 3) professionalization.

Yale: Certificate in Second Language Acquisition:

The Certificate in Second Language Acquisition (SLA) is offered by the Center for Language Study (CLS) and is specifically designed for Yale graduate students in departments of language and literature to provide a comprehensive training program in second language acquisition and language teaching methodology.

University of Washington: Graduate Certificate in Second and Foreign Language Teaching

Certificate students take three or four courses: a second/foreign language teaching methods course, a course in second language acquisition, and an additional course or two, as described below. Students also complete a capstone project which may be a research paper, a materials development project, or an experiential practicum or portfolio.

The SFLT Graduate Certificate requires a minimum of 18 credits, consisting of coursework (13-15 credits) and the capstone project (3-5 credits). Only six credits may overlap with the student's degree program. All Certificate courses must be taken for a grade, unless a course is only offered as credit/no credit, as is true for some of UW's teaching methods courses. Up to 5 credits may be at the 400-level.

Berkeley: Certificate in Teaching and Learning in Higher Education

As the academic job market has become increasingly competitive, it has become more important than ever to present evidence of excellence in teaching, even for faculty appointments at research-intensive universities. Some 70 PhD-granting institutions nationwide now offer certificate programs in teaching and learning to provide this evidence for their graduate students' dossiers. While there is great variation in the requirements of these programs, they share the goal of providing an overall structure within which to help graduate students develop their classroom skills, prepare for the teaching they will do as future faculty, and professionally document their activities as post-secondary instructors.

As a national leader in preparing graduate students for teaching, UC Berkeley is one of the few universities in the country that have a comprehensive policy on GSI mentoring. The

development activities that Berkeley GSIs undertake to fulfill the requirements of this policy — the Teaching Conference, the Online Ethics Course, and the 300-level pedagogy course in their disciplines — support GSIs in their teaching at UC Berkeley, but they also help form the foundation of their teaching and leadership skills in future academic and non-academic careers. Requirements for the UC Berkeley Certificate Program in Teaching and Learning in Higher Education include participation in workshops on teaching, a teaching observation, the creation of a teaching portfolio, and several other development activities. For details, please see Certificate Program Requirements.

University of Pennsylvania: CTL Teaching Certificate

The CTL Teaching Certificate provides Penn doctoral students with support for improving their teaching as well as recognition for their commitment to developing as teachers. The program encourages graduate students to become self-reflective teachers and to enhance their awareness of additional teaching practices by engaging in discussions about teaching.

The CTL Teaching Certificate also offers a structure through which interested graduate students can prepare themselves to become faculty in the future. The certificate is noted on the student's transcript, as a statement from the University of Pennsylvania that a graduate student has pursued advanced training in teaching.

NYU GSAS Teaching Certificate Program

The GSAS Teaching Certificate Program consists of two distinctive non-credit seminars open to Master's and Doctoral level students in the Graduate School of Arts and Science. Seeking to support the efforts of graduate students who wish to deepen their understanding of teaching and learning, the certificates are designed to help students develop a reflective teaching practice, improve teaching effectiveness and prepare for teaching careers in higher education.

10. Please list the program's faculty:

Professorial Faculty in French:

- Jennifer Cazenave, Assistant Profesor of French
- Odile Cazenave, Professor of French
- Dorothy Kelly, Professor of French
- Irit Kleiman, Associate Professor of Romance Studies
- Jeffrey Mehlman, Professor of French & University Professor

Professorial Faculty in Spanish:

- Alicia Borinsky, Professor of Spanish
- David Colmenares, Assistant Professor of Spanish
- James Iffland, Professor of Spanish
- Rodrigo Lopes de Barros, Assistant Professor of Spanish & Portuguese
- Christopher Maurer, Professor of Spanish
- Adela Pineda, Professor of Spanish

Lecturers in French & Spanish Who Teach the Pedagogy Seminars

- Alison Carberry, Senior Lecturer in Spanish
- Kirby Chazal, Senior Lecturer in French
- Susan Griffin, Master Lecturer in Spanish
- Lionel Mathieu, Lecturer in French

11. Please provide an administrative plan for the proposed new degree:

The certificate will be based in the Romance Studies Department, within the Graduate School of Arts & Sciences. The Romance Studies Director of Graduate Studies will oversee the certificate and administrative support will be provided by the Romance Studies Administrative Assistant.

12. Please provide an advising plan for the proposed new degree:

Romance Studies professorial faculty will provide primary advising regarding the certificate, with oversight and support from the Romance Studies Director of Graduate Studies.

13. For a proposed graduate program, please provide the admissions standards involved:

The certificate is available only to students who have matriculated into graduate level degrees within the Graduate School of Arts & Sciences at Boston University.

14. Please document any implications that the formation of the proposed new degree has on professional accreditation or licensure at the program or school/college level:

The certificate will strengthen GRS's position with regards to accreditation by demonstrating our commitment to providing our doctoral students with valued career skills.

15. For a proposed undergraduate program, please provide sample 4-year plans through the new degree or certificate:

N/A

16. If the new program includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course [NOTE: new courses will need Course Inventory Forms submitted to the Office of the Registrar]:

Although the certificate does not require any new courses, LL 691B may be taught in the future by professorial faculty, whereas in the past it was taught by lecturers. The teaching of LL 691B would be rotated among the professorial faculty. The regular course-load of the professor teaching LL 691B would be modified to distribute one of their courses to other faculty, most likely by allotting it to a lecturer, since moving LL 691B to the professorial faculty would free a lecturer to teach another course.

17. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

No new resources will be required.

18. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured?

Tuition/Fee Item	Amount

Examples:

Fulltime Tuition	*$25,490*
Graduate Student Services Fee	*$162*
Health and Wellness Fee	*$206*

or

Program Fee (bundled charge)	*$27,985*
Tuition component	*$21,985*
Fees component	*$6,000*

The certificate program will be undertaken only by doctoral students in Romance Studies. Given that: a) these students are universally provided with fellowships by the Graduate School of Arts & Sciences and b) that all coursework taken for the certificate can also be applied to their degree programs, the question of charges is not applicable.

19. Please describe the proposed enrollment or the enrollment required to cover the start-up costs of the proposed new degree:

Enrollment will be drawn from students engaged in the doctoral programs in French Language & Literature and Hispanic Language & Literatures. The certificate will be an optional undertaking for the students, but we anticipate that the majority will wish to do it. We estimate that three to four additional students will enroll in the certificate program each year, for a total (typically) of twelve to sixteen students enrolled in the certificate program at any given time.

20. Please provide the Bulletin copy (exactly as it will appear) for the proposed new degree including all text connected to the program (requirements, description, program goals/outcomes)[NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes]:

The Graduate Certificate in Teaching Language, Literature, and Film prepares doctoral students to teach French or Spanish language at all levels, and literature and film at the undergraduate

and graduate levels, through both pedagogical courses and in-class experience. Doctoral students who complete the certificate receive extensive mentored guidance, pedagogical instruction, professional training, and teaching experience, which gives them an expertise valued in language and literature programs.

Requirements

- Successfully complete the 4-credit LF/LS 850 graduate seminar on literary theory and seven approved 4-credit courses in the appropriate program, Spanish or French PhD.
- Successfully complete at least one graduate course in the relevant literature (Spanish or French) and at least one graduate course on film. Below is a list of approved film courses:
    - CAS LF 586 Narrative Film
    - CAS LF 569 Algeria in Words & Images
    - CAS LS 579 Hispanic Cinema
    - CAS LS 580 Mexico City in Literature & Film
    - CAS LS 581 The Mexican Revolution Revisited
    - Any CIMS Graduate Level Film Course
    - The Romance Studies Director of Graduate Studies may also approve other film courses on a case by case basis.
- Teach French/Spanish courses in the Romance Studies Department for four semesters (4 courses).
- Successfully complete LL690, a four-credit seminar and methods course, geared on the one hand to standards- and proficiency-based instruction, diverse practices for foreign language instruction, assessment, and the development of effective lesson plans in preparation for the student's first semester of teaching.
- Successfully complete LL691A, a two-credit teaching practicum seminar that fosters a professional outlook on language teaching and learning while applying course content from LL690 to the first-year teaching experience.
- Successfully complete LL691B, a two-credit seminar on professional development for literature/film and language instructors, which would include preparation of CVs, mock interviews, and other preparation for the job search, as well as examples of teaching performance and materials, such as video clips of class, syllabi.
- Create a teaching/research portfolio to be reviewed by a committee of faculty members.

Learning Outcomes

1. Students will be prepared to teach French or Spanish language, literature, and film classes at all undergraduate levels and at graduate levels.
2. Students will understand key concepts of second-language acquisition theory and practice
3. Students will be able to articulate – for example, to prospective employers – their knowledge of the teaching of language, literature, and film, as well as their principles and practices in the field of language teaching.
4. Students will be able to describe their research and its importance to the field

21. Please submit a complete budget for the new program or credit-bearing certificate, using the appropriate budget template, even if no additional resources are needed.

The certificate will neither generate additional revenue nor incur significant expenses beyond what are already needed for our doctoral programs. As such, it will not have a budgetary impact.

22. What is the average number of years for a full-time student to complete the program?

Four years.

23. What is the maximum number of years allowed to complete the program?

Five years.

24. If a credit-bearing certificate, should the students be eligible for Title IV funds?

N/A

25. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

16.0900 Romance Languages, Literatures, & Linguistics, General

26. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

No.

27.Are you phasing out or replacing another program? If so, what program?

No.

Certificate in Teaching Language, Literature, and Film

This certificate is intended for students in the French and Hispanic Ph.D. programs at BU, who have completed the required courses for the Ph.D. and who have taught language and/or literature at B.U. for at least two years.

The requirements for the certificate in Teaching Language, Literature, and Film

- Successfully complete the 4-credit LF/LS 850 graduate seminar on literary theory and the seven approved 4-credit courses in the appropriate program, Spanish or French PhD.
- Successfully complete at least one course in the relevant literature (Spanish or French) and at least one graduate course on film.[1]
- Teach French/Spanish courses in the Romance Studies Department for four semesters (4 courses).
- Successfully complete LL690, a four-credit seminar and methods course, geared to standards- and proficiency-based instruction, diverse practices for foreign language instruction, assessment, and the development of effective lesson plans in preparation for the student's first semester of teaching.
- Successfully complete LL691A a two-credit teaching practicum seminar that fosters a professional outlook on language teaching and learning while applying course content from LL690 to the first-year teaching experience.
- Successfully complete LL691B a two-credit seminar on professional development for literature/film and language instructors, which would include preparation of CVs, mock interviews, and other preparation for the job search, as well as examples of teaching performance and materials, such as video clips of class, syllabi.
- Create a teaching/research portfolio to be reviewed by a committee of faculty members.

In line with the 2014 report of the MLA task force on Doctoral study in Modern Language and Literature[2] and their recommendations for graduate programs, we believe that a certificate in teaching language, literature, and film/visual culture will give our graduate students key professional training and an additional advantage when they go on the job market.

[1] **Courses on Film**
CAS LF 586 Narrative Film
CAS LF 569 Algeria in Words and Images
CAS LS 579 Hispanic Cinema
CAS LS 580 Mexico City in Literature and Film
CAS LS 581 The Mexican Revolution Revisited
Any CIMS graduate film course

[2] https://www.mla.org/Resources/Research/Surveys-Reports-and-Other-Documents/Staffing-Salaries-and-Other-Professional-Issues/Report-of-the-Task-Force-on-Doctoral-Study-in-Modern-Language-and-Literature-2014

Already as part of their curriculum, our graduate students take three semesters of courses in pedagogy. In the semester before they begin teaching, students take LL690— a methods course, geared to standards- and proficiency-based instruction, core practices for foreign language instruction, assessment, strategies for teaching text and film/visual culture, and the development of effective lesson plans. In the semester when they begin teaching, students take the first part of LL691, which focuses on the use of technology for pedagogical purposes and the application of course content from LL690 to the first-year teaching experience. This course also fosters a professional outlook on language teaching and learning. Students deepen their knowledge of instructional technologies, further develop proficiency-based pedagogy projects for their own courses, and prepare teaching philosophies and other teaching and research materials.

In every course from 111-212, graduate students receive materials, assistance, and guidance from the coordinators of the courses they teach.

We have revised the final course (LL691), which will now take place normally in the spring semester of the students' fourth year, which is their last year of teaching while on their fellowship and just before they begin to look for jobs. This course focuses on professional development for language and literature/film instructors and includes as its main focus the creation of teaching and research materials for the job search. It will also include: an introduction to job application procedures, such as Interfolio, mock interviews, curriculum design and development, discussion of the work required for a college/university teaching position: professional service, teaching and research time-management, etc. The instructor of 691 may also invite pertinent faculty members to classes on such issues as mock interviews (which we already provide on an ad hoc basis).

The ePortfolio.
In the ePortfolio, students will include materials that they develop for their job searches, as well as materials that they will have developed throughout their coursework in pedagogy and in their classes. This material will normally include:

- A curriculum vitae
- A research statement
- An abstract for a conference presentation
- Revision of a course paper for submission for publication
- A statement of teaching philosophy
- Preparation of other statements that are currently being requested (such as a diversity statement, etc.)
- Samples of syllabi, assignments, lesson plans, examples of assessment and rubrics, and projects related to technology.
- Students will include short clips of their teaching filmed at different times and while teaching different levels. These clips are frequently required when applying for a teaching position and will allow students to highlight a wide variety of pedagogical skills. These clips will also allow for self-reflection and mentor-guided criticism.

Part of the challenge presented by the ePortfolio is to curate this material in a meaningful and informative way, which will require that students explain the import and effectiveness of what they have included. This allows students to practice speaking about their research and teaching (something that they will likely be asked to address during Skype and on-campus interviews).

The completion of this certificate will give students a strong foundation for articulating their knowledge of the teaching of literature and film, as well as their principles and practices in the field of language teaching, while strengthening their CVs and perhaps introducing them to prospective employers.

Boston University College of Arts & Sciences
Astronomy Department
725 Commonwealth Avenue
Boston, Massachusetts 02215
T,F 617-353-2625

MEMORANDUM

To: Professor Emily Barman, Associate Dean, Graduate School of Arts and Sciences

From: Professor Dan Clemens, Chair, Astronomy Department

Date: October 17, 2019

Re: Proposal to revise the requirements for the PhD and MA in Astronomy Degrees

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Based on issues in our existing PhD program identified both by our recent Academic Program Review and by our own ad hoc Graduate Program Review Committee, the faculty of the Astronomy Department have developed the attached proposal to revise the PhD and MA in Astronomy degrees at Boston University. The revisions, when enacted, will bring our program into closer alignment with requirements for the PhD at peer-like institutions across the US and within current BU STEM departments.

The chief issues have been an excessive number of foundational (core) courses, an excessive number of total lecture-based courses, a high-stakes written comprehensive examination, late starts in the conduct of research by our graduate students, and excessively long times to PhD completion as compared to peer-like institutions. All of these issues likely also contribute to our overall low (~50%) success rate of PhD completion for graduate students entering our program.

The proposed PhD Degree changes would reduce the number of foundational (core) cores from eight 4-credit plus two 2-credit courses to six 4-credit and one 2-credit course, reduce the number of required advanced 4-credit courses from three to two, and eliminate the written comprehensive examination. Remaining in place would be the oral qualifying examination, the journal club and seminar courses, and the research-related courses. The number of research-related credits taken by students would increase from a maximum of 12 to a maximum of 26 (of the 64 total credits required for the PhD). In reducing the number of foundational courses taken by students in their first and second years of graduate study, earlier involvement with research projects will be encouraged, enabling students to easily earn the 26-credits. These research-related courses are built around the close mentor-mentee relationships that are at the core of astronomy graduate student training here and at all peer institutions.

The proposed MA Degree changes incorporate the proposed PhD Degree changes, primarily by removing the pathway to degree through the PhD written comprehensive exam and adding options for a “masters pass” of the Oral PhD Qualifying exam or for a separate non-thesis oral MA exam. We continue the practice of not awarding an MA in Astronomy based solely on completed coursework, though coursework is required to receive that degree.

Note that we do not admit, and have not admitted for a long time, students into the MA program. Instead, students are admitted into the PhD program. However, the MA Degree is an important accomplishment for our PhD students, both those continuing in the program and those exiting the program.

Attached to this cover memo are the following:

1. The “*Proposed Change to an Existing Degree: Academic Component*” form for the PhD
2. The proposed new bulletin description for the PhD in Astronomy
3. The current (old) bulletin description for the PhD in Astronomy

4. The "*Proposed Change to an Existing Degree: Academic Component*" form for the MA
5. The proposed new bulletin description for the MA in Astronomy
6. The current (old) bulletin description for the MA in Astronomy
7. The "*CAS/GRS Curriculum Request Cover Sheet*" for our proposed course GRS AS 706
8. The proposed example syllabus for GRS AS 706 ("Radiative Processes and Spectroscopy")
9. A table listing all current courses and proposed courses, highlighting which courses will remain unchanged, which will cease to be offered, which will have numbering changes, which need prerequisite changes to bring them into compliance with the proposed program changes, and which courses will be reformulated (only AS706)
10. A table of proposed prerequisite updates for the advanced graduate courses (those numbered AS750-786)

The faculty of the Department of Astronomy have reviewed and voted affirmatively or indicated consensus approval of all of the elements listed above, at faculty meetings that took place on 9/11/2018, 9/18/2018, 10/2/2018, 10/16/2018, 10/23/2018, 11/27/2018, 12/4/2018, 12/17/2018, 2/5/2019, 2/26/2019, 3/5/2019, 3/20/2019, 4/3/2019, 4/10/2019, 9/17/2019, and 10/8/2019. A final vote of the faculty on the full set of documents contained here, conducted via email between 10/10/2019 and 10/17/2019, was unanimous in favor of the revisions proposed.

We ask that this proposal be considered by GRS for approval and forwarding, that required elements be conveyed to the GAAC for deliberation and approval, and that simpler elements (renumbering of courses without title or content changes; revision of prerequisite descriptions) be permitted to proceed administratively.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History):

MA in Astronomy

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Dan Clemens, Chair; clemens@bu.edu; (617) 353-6140

2. Please describe briefly the proposed change to the existing degree:

Change number of required courses numbered GRS AS 700-799 from six to five.

Eliminate the Written Comprehensive Examination option, as the exam will not be offered. Replaced with students achieving at least a “masters pass” if they take the PhD Oral Qualifying exam, or a successful masters thesis defense (for students electing to write a thesis), or a successful Masters Oral Comprehensive Examination.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Separately, we are proposing significant changes to the PhD Degree in Astronomy. These changes impact the MA program in that the written comprehensive exam will no longer be offered and fewer foundational (core) courses will be offered. To respond to the latter, we seek to reduce the number of required foundational courses for the MA from six (of what had been eight courses) to five (of what will be six courses), to allow some student flexibility. To replace the written qualifiers, we propose a new “masters

pass" level for the PhD Oral Qualifying Exam for the MA. Alternatively, students writing a masters thesis may successfully pass a thesis defense. Finally, for students not taking the PhD Oral and not writing a thesis, successful completion of a Masters Oral Comprehensive exam will demonstrate mastery of astronomy and related topics at the MA level.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

These changes are expected to have minor impact on the MA and PhD programs in Astronomy, but are necessary to align the MA with the proposed changes taking place in the PhD program.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

Current program	Revised program
Courses	
Eight 4-credit courses, of which six must come from AS700-700	Eight 4-credit courses, of which **five** must come from AS700-799
Examinations and Thesis	
Successful completion of one of the following: 1. Written Comprehensive Exam – must pass at "masters level" by end of second year. 2. Oral Thesis Defense of a written MA thesis	Successful completion of one of the following: 1. PhD Oral Qualifying Exam, at least at the "masters pass" level 2. Oral Thesis Defense of a written MA thesis 3. Masters Oral Comprehensive Exam – covering foundational astronomy courses

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

These changes directly stem from the recommendations from our recent Academic Program Review and from our own graduate program review committee report.

7. Please list learning outcomes for the revised program:

(Unchanged from Existing Program:)

1. Demonstrate graduate level knowledge of astronomy and physics, including the following topics: Fundamental Physics and Astrophysics; topics include Gravitation, Electromagnetism, and Quantum Mechanics appropriate to astronomy, and the dynamical behavior of space and astrophysical plasmas
2. Demonstrate graduate level knowledge of observational techniques used to study astronomical and space phenomena
3. Perform directed research within that discipline
4. Present directed research to a committee of faculty members and to a scientific audience

8. How does the change place your program in the context of programs at peer institutions?

No change expected.

9. How does the change affect other academic units and existing programs at the University?

None. We have no required courses in other units. We have seen only a few ENG students taking our courses, and this can continue.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

Chair and DGS (Prof. Paul Withers) met with the current graduate students as a whole in Fall 2018, and with their elected representatives regularly, to keep them informed of the likely changes, but to also warn them that timescales are not immediate. Current students also meet every semester with the DGS for course and program planning and are informed of likely changes. Potential incoming students who came to on-campus visits also had sessions with the Chair where these topics were raised and discussed. As most of our current foundational courses are offered on an alternate-year schedule, we anticipate only minimal impacts to the existing students' programs and will offer bridging course offerings as needed. Courses completed under the existing program will receive full value equivalencing under the proposed program.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

We have 36 graduate students in the PhD program, which is about our historical average. None are currently enrolled in the MA program. Note that completion of the MA degree is normal for our PhD students, whether they go on to complete their PhD or exit the PhD program.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

Not applicable

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

AS706 (Radiative+Spectroscopy) will be taught by Profs. Muirhead, Marscher, and Bania

In reducing the number of foundational graduate courses for the PhD program, the intent is to increase the frequency of the offerings of the advanced graduate courses, which can be taken by MA degree students. Thus, there should be no net change in the number of FTE faculty members tasked to deliver the graduate courses, compared to the delivery of the existing program.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget [NOTE: eCAP requires a budget form with proposal submissions. The budget allows reviewers to understand resources that might be needed to undertake a new degree program or make a significant change to an existing program. Approval of the eCAP proposal is an approval of the academic action and does not signal approval for any budgetary requests (additional faculty, revenue share)]:

No changes anticipated.

15. Please describe the budgetary impact that the proposed change will have:

None. The current FTEs assigned to the graduate program will continue effectively unchanged. The reduction in foundational courses taken per semester will be partially applied to increase the frequency of offerings of the advanced courses (most are currently on a 4-year or more cycle).

16. Please provide the bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

Attached

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

None.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

The revised program description and bulletin pages will replace the current ones already hosted on our department's web site. No other marketing will take place for this revised program.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

None.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission [NOTE: eCAP requires a budget form with proposal submissions. The budget allows reviewers to understand resources that might be needed to undertake a new degree program or make a significant change to an existing program. Approval of the eCAP proposal is an approval of the academic action and does not signal approval for any budgetary requests (additional faculty, revenue share)].

Tuition/Fee Item	**Amount**

Examples:

Fulltime Tuition	*$26,408*
Graduate Student Services Fee	*$166*
Health and Wellness Fee	*$212*

or

Program Fee (bundled charge)	*$27,985*
Tuition component	*$21,985*
Fees component	*$6,000*

Proposed (New) Bulletin Copy for MA

MA in Astronomy

Students admitted to the PhD program may opt for a master's degree en route to the PhD if they satisfy the appropriate requirements, but initially students may not apply for a master's degree alone.

Course Requirements

The MA in Astronomy requires completion of a total of eight 4-credit graduate courses (32 credits) in astronomy with a grade of B– or higher. At least five of these must be astronomy courses numbered 700–799.

Language Requirement

There is no foreign language requirement for this degree.

Thesis/Comprehensive Exam

The candidate must pass an oral Comprehensive examination by one of three means. For a student who writes a master's thesis, describing a research project carried out by the student and directed by a faculty member, the oral exam takes place as part of the thesis defense. For students taking the PhD Oral Qualifying Examination, achieving either a "masters pass" or a "PhD pass" will meet the masters Comprehensive examination requirement. Alternatively, a student wishing to leave with an MA may have a Masters Oral Comprehensive Examination committee, consisting of three Astronomy faculty members, to query the student regarding their understanding of graduate level physics, astrophysics, and space physics to ascertain mastery of these topics.

A master's thesis must give evidence of the candidate's ability to understand, critically evaluate, and competently carry forward a scientific investigation. This is achieved by advancing an experimental technique, by extending the application of a physical theory, or by collecting new scientifically relevant data or analyzing previously existing data. The thesis must demonstrate the candidate's ability to present the results of his or her work in a logical and coherent manner. The thesis is judged in an oral examination administered by a committee of three faculty members, including the student's advisor. The committee must approve a prospectus of the thesis at least three months before the oral examination.

Existing (Old) Bulletin Copy for MA

MA in Astronomy

Students admitted to the PhD program in Astronomy may opt for a master's degree en route to the PhD if they satisfy the appropriate requirements, but initially students may not apply for a master's degree alone.

The MA in Astronomy prepares students for careers in astronomically related fields, astronomy education, or for entry into a PhD program. Students normally enter this program with an undergraduate degree in astronomy, physics, or another physical science.

Course Requirements

The MA in Astronomy requires completion of a total of eight graduate courses (32 credits) in astronomy and physics with a grade of B– or higher. At least six of these must be astronomy courses numbered 700–799.

Language Requirement

There is no foreign language requirement for this degree.

Thesis/Comprehensive Exam

The candidate must either pass the written Astronomy Comprehensive Examination or write a master's thesis describing a research project carried out by the student and directed by a faculty member.

The Comprehensive Exam is given in May each year. The exam consists of two 3-hour written tests administered on two separate days. The exam is designed to test the student's ability to solve quantitative problems in astrophysics and space physics using both knowledge of the material covered in the core courses (GRS AS 700–749) and application of basic physical principles.

Instead of passing the written Astronomy Comprehensive Examination, the student may complete a master's thesis. This thesis must give evidence of the candidate's ability to understand, critically evaluate, and competently carry forward a scientific investigation. This is achieved by advancing an experimental technique, by extending the application of a physical theory, or by collecting new scientifically relevant data or analyzing previously existing data. The thesis must demonstrate the candidate's ability to present the results of his or her work in a logical and coherent manner. The thesis is judged in an oral examination administered by a committee of three faculty members, including the student's advisor. The committee must approve a prospectus of the thesis at least six months before the oral examination.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History):

PhD in Astronomy

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Dan Clemens, Chair; clemens@bu.edu; (617) 353-6140

2. Please describe briefly the proposed change to the existing degree:

Change number of required foundational courses from eight 4-credit courses plus two 2-credit courses, to six 4-credit courses plus one 2-credit course.

Change number of 4-credit advanced courses required from three to two.

Eliminate the Written Comprehensive Examination.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

During the AY17/18, our ad hoc graduate program review committee (GPRC - consisting of three faculty members, three current graduate students, and one former graduate student) examined our existing graduate program and those of peer institutions, as recommended by our recent Academic Program Review. The GPRC found several areas that needed attention. First, our numbers of required courses were well beyond our peers. We have required eight foundational (core) courses (plus two 2-credit course) while the mean for the 32 peer-like institutions that grant PhDs in

Astronomy is just under six. Similarly, our total course requirement (foundationals plus advanced) is eleven, while the 32 peer-like institutions average nine. Our average time to PhD (~6.5 years) was also longer than our peers (~5.5 years), partially the result of our overemphasis on coursework while our peers stress early involvement in research. Our written comprehensive exam introduced unnecessarily high levels of stress, and there is a strong movement to remove such high-stakes exams, both within Astronomy (only about half of the 32 require written qualifiers) and within other STEM departments at Boston University (Chemistry and Physics both have oral qualifying exams only, while Earth and Environment and Biology have a mix of orals and orals plus written qualifiers). The heavy foundational course load has also had the unfortunate effect of allowing advanced courses to be offered too infrequently, due to our small number of faculty. The heavy coursework plus written comprehensive exam both have contributed to delaying by 1-2 years the start of significant research work by our students. One benefit of the proposed changes is the increase in the number of research credits students will complete in order to reach the required credit totals for a PhD. This change from 12 credits to 26 credits will encourage students to seek research opportunities earlier in their graduate careers, thus enhancing their overall career prospects. We note that at least one of our peer-plus institutions (MIT) has little to no course requirements and instead directs students immediately into research projects. The year-end GPRC report was the starting point for consideration and deliberation by the entire AS faculty throughout AY18/19, leading to a series of votes to revise key elements of the graduate curriculum including requirements, exams, and course contents.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

These changes are expected to result in earlier onset of significant research involvement by our graduate students, leading to richer publication histories and quicker times to PhD completion. All of these are necessary for our program to remain competitive for the highest quality of incoming graduate students and to satisfy federal funding agencies regarding costs necessary to achieve PhDs.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

Current program	Revised program
Required "Foundational" Courses	
AS701 (4cr) – Introductory Astrophysics	Same, **with some of AS725 inserted**
AS703 (4cr) – Introductory Space Physics	Same
AS710 (4cr) – Observational Techniques	**Renumbered to AS709**
AS712 (4cr) – Radiative Processes in Astrophysics	**AS706 – Radiative Processes and Spectroscopy (compressed version of 712+713)**
AS713 (4cr) – Astronomical Spectroscopy	

AS725 (4cr) – Gravitational Astrophysics	Eliminated, some material into AS701
AS726 (4cr) – Cosmic Gas Dynamics	**Renumbered to AS704**
AS727 (4cr) – Cosmic Plasma Physics	**Renumbered to AS708**
AS802 (2cr) – Graduate Research and Scholarship (RCR course)	**Renumbered to AS720**
AS803 (2cr) – Research Methods in Astronomical Data Analysis	Eliminated
Seminars with Journal Clubs	
AS850, 851, 865, 866 – Seminars (with Journal Clubs) – 2cr each, 4cr requirement.	Same
Advanced Coursework	
Three 4-cr "Advanced" courses, drawn from 751, 753, 757, 759, 781, 783, 785, 786, 791, and/or 793	**Two** 4-cr "Advanced" courses from same list.
Up to 12 cr from research courses numbered AS900-919	**Up to 26 cr from research courses**, **same numbers**
Examinations and Dissertation	
Written Comprehensive Exam – must pass by end of second year – covers topics in the 8 foundational courses.	**Eliminated**
Oral Qualifying Exam – normally taken at end of third year, after written comprehensive exam and after conducing directed research project.	**Oral Qualifying Exam – completed by end of 3rd academic year. Primarily covers a directed research project conducted before the end of the 3rd year.**
PhD Dissertation (including prospectus)	Same
PhD Oral Examination	Same

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

These changes directly stem from the recommendations from our recent Academic Program Review and from our own graduate program review committee report.

7. Please list learning outcomes for the revised program:

(Unchanged from Existing Program:)

1. Demonstrate graduate level knowledge of astronomy and physics, including the following topics: Fundamental Physics and Astrophysics; topics include Gravitation, Electromagnetism, and Quantum Mechanics appropriate to astronomy, and the dynamical behavior of space and astrophysical plasmas
2. Demonstrate graduate level knowledge of observational techniques used to study astronomical and space phenomena

3. Demonstrate an understanding of the forefront of the field of the student's PhD research.
4. Ability to communicate astronomical information orally to a graduate and faculty level audience
5. Ability to communicate astronomical information in written form
6. Demonstrate critical thinking about astronomical topics as well as other technical and general scientific topics
7. Perform original scientific research at a high level
8. Publish original research in a dissertation and (typically peer-reviewed) journals
9. Appropriately use and acknowledge work of others
10. Disseminate and handle data and other research products in an appropriate manner

8. How does the change place your program in the context of programs at peer institutions?

Reducing the total number of required foundational and advanced courses from 12 (existing) to 8.5 brings our program closer to the median (9) for 32 peer-like graduate astronomy programs across the nation, based on data obtained as part of our recent Academic Program Review and recently updated. Removing the high-stakes written comprehensive examination also is in line with the dominant practice and trends, again from data drawn from the peer-like institutions and from STEM departments within BU. The goal of reduced time to PhD, when achieved, will also put us more in the norm with our peers, as will a greater focus on research credits. Attending to all of these is required in order to be able to compete for the best students, who report strong interest in early starts to their graduate scientific research.

9. How does the change affect other academic units and existing programs at the University?

None. We have no required courses in other units. We have seen only a few ENG students taking our courses, and this can continue with the new/existing course suite.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

Chair and DGS (Prof. Paul Withers) met with the current graduate students as a whole in Fall 2018, and with their elected representatives regularly, to keep them informed of the likely changes, but to also warn them that timescales are not immediate. Current students also meet every semester with the DGS for course and program planning and are informed of likely changes. Potential incoming students who came to on-campus visits also had sessions with the Chair where these topics were raised and discussed. As most of our current foundational courses are offered on an alternate-year schedule, we anticipate only minimal impacts to the existing students' programs and will offer bridging course offerings as needed. Courses completed under the existing program will receive full value equivalencing under the proposed program.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

The astronomy graduate program started AY19/20 with 36 graduate students in the PhD program.

We expect that the program changes will increase application pressure, and we will need to reduce the number of admission offers to keep the average number of matriculations per year closer to our 5-6 person goal.

Our faculty, especially in Space Physics, have funding and immediate needs for graduate Research Fellows.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

Not applicable

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

AS706 (Radiative+Spectroscopy) will be taught by Profs. Muirhead, Marscher, and Bania

In reducing the number of foundational courses, the intent is to increase the frequency of the offerings of the advanced courses. Thus, there should be no net change in the number of FTE faculty members tasked to deliver the graduate courses, compared to the delivery of the existing program.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget [NOTE: eCAP requires a budget form with proposal submissions. The budget allows reviewers to understand resources that might be needed to undertake a new degree program or make a significant change to an existing program. Approval of the eCAP proposal is an approval of the academic action and does not signal approval for any budgetary requests (additional faculty, revenue share)]:

No changes anticipated.

15. Please describe the budgetary impact that the proposed change will have:

None. The current FTEs assigned to the graduate program will continue effectively unchanged. The reduction in foundational courses taken per semester will be partially applied to increasing the frequency of offerings of the advanced courses (most are currently on a 4-year or more cycle).

16. Please provide the bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

Attached

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None.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

The revised program description and bulletin pages will replace the current ones already hosted on our department's web site. No other marketing will take place for this revised program.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

None.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission [NOTE: eCAP requires a budget form with proposal submissions. The budget allows reviewers to understand resources that might be needed to undertake a new degree program or make a significant change to an existing program. Approval of the eCAP proposal is an approval of the academic action and does not signal approval for any budgetary requests (additional faculty, revenue share)].

Tuition/Fee Item	Amount

Examples:

Fulltime Tuition	*$26,408*
Graduate Student Services Fee	*$166*
Health and Wellness Fee	*$212*

or

Program Fee (bundled charge)	*$27,985*
Tuition component	*$21,985*
Fees component	*$6,000*

Proposed (New) Bulletin Copy for PhD

PhD in Astronomy

The PhD program in Astronomy prepares students to engage in research at the forefront of their field and to begin a position in academia or research. Students normally enter this program with an undergraduate degree in astronomy, physics, or another physical science.

Course Requirements

Students must accumulate 64 credits with a grade of B− or higher from graduate-level classes. Course requirements are as follows:

- 24 credits must be from 4-credit astronomy (AS) courses numbered GRS 701–749
- 2 credits must from GRS AS 720 (Graduate Research and Scholarship).
- 8 credits must be from 4-credit advanced AS courses numbered GRS 750–799 or, with the permission of the director of graduate studies, relevant graduate-level courses offered within Boston University. Advanced courses outside of Boston University require petition to the Astronomy faculty.
- 4 credits must be from any combination of 2-credit AS seminar courses (which may be repeated for credit):
    - GRS AS 850/851 Astrophysics Seminar
    - GRS AS 865/866 Space Physics Seminar
- The remaining up to 26 credits are normally expected to come from research courses numbered GRS AS 900–919.

In addition to the requirements listed above, all students are expected to participate in a journal club and seminar series each semester that they are in residence. Students with prior graduate work may be able to transfer course credits. For details, see the GRS Transfer of Credits policy.

Language Requirement

There is no foreign language requirement for this degree.

Qualifying Examination

Students must pass an Oral Qualifying Examination by the end of their third academic year. During the year preceding the Oral Qualifying Examination, the student should undertake a directed research project with a member of the faculty. Ideally, the research should lead to a potential dissertation topic. The purpose of this directed research is to ensure that the student has the preparation and the ability to conduct the original research required for the PhD dissertation. It is expected that the directed research will lead to publishable results, but publication prior to the Oral Qualifying Examination is not required.

The Oral Qualifying Examination is largely based on the directed research: the student presents the results of the research in a seminar setting and is examined afterward by a panel consisting of the student's research advisor and at least two other members of the Department of Astronomy faculty. The panel questions the student about his or her research and also about the student's knowledge of related areas of physics and astronomy.

Dissertation and Final Oral Examination

Candidates must demonstrate their abilities for independent study in a dissertation representing original research. A prospectus for the dissertation must be developed by the student and approved by the readers, the director of graduate studies, and the department chair/program director. Candidates must undergo a final oral examination in which they defend their dissertation as a valuable contribution to knowledge in astronomy, astrophysics, or space physics. They must also demonstrate mastery of their field of specialization. All portions of the dissertation and final oral examination must be completed as outlined in the GRS General Requirements for the Doctor of Philosophy Degree.

Any Astronomy PhD student who has fulfilled the requirements of the MA in Astronomy can be awarded an Astronomy MA degree.

Existing (Old) Bulletin Copy for PhD

PhD in Astronomy

The PhD program in Astronomy prepares students to engage in research at the forefront of their field and to begin a position in academia or research. Students normally enter this program with an undergraduate degree in astronomy, physics, or another physical science.

Course Requirements

Students must accumulate 64 credits with a grade of B− or higher from graduate-level classes. Course requirements are as follows:

- 32 credits must be 4-credit astronomy (AS) courses numbered GRS 701–749
- 12 credits must be advanced AS courses numbered GRS 750–799 or, with the permission of the director of graduate studies, graduate-level physics or engineering courses
- 4 credits must be research preparation courses (or approved substitutes), including:
    - GRS AS 802 Graduate Research and Scholarship
    - GRS AS 803 Research Methods in Astronomical Data Analysis
- 4 credits must be from any combination of AS seminar courses:
    - GRS AS 850/851 Astrophysics Seminar
    - GRS AS 865/866 Space Physics Seminar

No more than 12 credits may be for research courses numbered GRS AS 900–919.

In addition to the requirements listed above, all students are expected to participate in a journal club and seminar series (GRS AS 850, 851, 865, or 866) each semester that they are in residence, although they will only receive a total of four academic credits toward their degree by taking these courses.

Students with prior graduate work may be able to transfer course credits. For details, see the GRS Transfer of Credits policy.

Language Requirement

There is no foreign language requirement for this degree.

Comprehensive Examination

Students must pass both the written Astronomy Comprehensive Examination and the Oral Qualifying Examination. The written Comprehensive Exam consists of two 3-hour written tests administered on two separate days. The exam is designed to test the student's ability to solve quantitative problems in astrophysics and space physics using both knowledge of the material

covered in the core courses (GRS AS 701–749) and application of basic physical principles. The written Comprehensive Exam must be passed no later than the end of the spring semester of a student's second year in the program.

After passing the written Comprehensive Examination, a student must take the Oral Qualifying Examination within the subsequent academic year. During this year the student should undertake a directed research project with a member of the faculty. Ideally, the research should lead to a potential dissertation topic. The purpose of this directed research is to ensure that the student has the preparation and the ability to conduct the original research required for the PhD dissertation. It is expected that the directed research will lead to publishable results.

The Oral Qualifying Examination is largely based on the directed research: the student presents the results of the research in a seminar setting and is examined afterward by a panel consisting of the student's research advisor and at least two other members of the Department of Astronomy faculty. The panel questions the student about his or her research and also about the student's knowledge of related areas of physics and astronomy.

Dissertation and Final Oral Examination

Candidates must demonstrate their abilities for independent study in a dissertation representing original research. A prospectus for the dissertation must be developed by the student and approved by the readers, the director of graduate studies, and the department chair/program director. Candidates must undergo a final oral examination in which they defend their dissertation as a valuable contribution to knowledge in astronomy, astrophysics, or space physics. They must also demonstrate mastery of their field of specialization. All portions of the dissertation and final oral examination must be completed as outlined in the GRS General Requirements for the Doctor of Philosophy Degree.

It is possible for a student admitted to the Astronomy PhD program to leave the program with an MA degree only. This may occur if the student fails to complete the PhD requirements and/or if the student decides that he or she no longer wishes to remain in the PhD program. To exit the program with an MA, the student must fulfill all of the requirements listed for the MA in Astronomy.

Astronomy Graduate Courses - Revised Program (V 20191010)

Number								
Former	Proposed	Cr	Title	Offerings	Target Audience	Enrollment	Instructors	Status
			Foundational (Core) Courses					
701	701	4	Introduction to Astrophysics	Every Fall	1st Years	4-8	Marscher, Blanton, Espaillat	Existing
703	703	4	Introduction to Space Physics	Every Fall	1st Years	4-8	Oppenheim, Hughes, Opher, Li	Existing
710	709	4	Observational Techniques	Even Falls	1st+2nd Years	8-16	Muirhead, Blanton, Clarke	Existing
712		4	Radiative Processes in Astrophysics	delete				
713		4	Astronomical Spectroscopy	delete				
725		4	Gravitational Astrophysics	delete				
726	704	4	Gas Dynamics	Odd Springs	1st+2nd Years	8-16	Marscher, Opher,Withers, Hughes	Existing
	706	4	Radiative Processes and Spectroscopy	Odd Springs	1st+2nd Years	8-16	Marscher, Bania, Muirhead	**712+713 merge**
727	708	4	Plasmas	Even Springs	1st+2nd Years	8-16	Oppenheim, Opher, Hughes, Li	Existing
802	720	2	Graduate Research and Scholarship (RCR)	Every Spring	1st Years	4-8	Clemens, Withers, Brainerd	Existing
803		2	Research Methods in Astronomical Data Analysis	delete				
			Advanced Courses					
751	751	4	Interstellar Media	1/4yrs Fall	> 2nd Years	4-8	Bania, Clemens, Espaillat	Existing
753	753	4	Normal Galaxies and the Milky Way	1/4yrs Spring	> 2nd Years	4-8	Blanton, Brainerd	Existing
757	757	4	High-Energy Astrophysics	1/4yrs Fall	> 2nd Years	4-8	Marscher, Blanton, Brainerd	Existing
759	759	4	Cosmology	1/4yrs Spring	> 2nd Years	4-8	Brainerd, Marscher, Blanton	Existing
781	781	4	Planetary Atmospheres	1/4yrs Fall	> 2nd Years	4-8	Withers, Clarke	Existing
783	783	4	Ionospheres	1/4yrs Spring	> 2nd Years	4-8	Oppenheim	Existing
785	785	4	Magnetospheres	1/4yrs Fall	> 2nd Years	4-8	Hughes, Li	Existing
786	786	4	The Sun and Heliosphere	1/4yrs Spring	> 2nd Years	4-8	Opher	Existing
			Journal Club + Seminar Courses					
850	850	2	Astrophysics Seminar	Every Fall	>1st years	4-12	Staff	Existing
851	851	2	Astrophysics Seminar	Every Spring	>1st years	4-12	Staff	Existing
865	865	2	Space Physics Seminar	Every Fall	>1st years	4-12	Staff	Existing
866	866	2	Space Physics Seminar	Every Spring	>1st years	4-12	Staff	Existing
			Directed Study and Research Courses					
911	911	Var	Directed Study in Astronomy (Fall)	Arr	All	Arranged with individual faculty members		Existing
912	912	Var	DIrected Study in Astronomy (Spring)	Arr	All	Arranged with individual faculty members		Existing
901	901	Var	Reseach in Astronomy (Fall)	Arr	post Oral Quals	Arranged with individual faculty members		Existing
902	902	Var	Reseach in Astronomy (Spring)	Arr	post Oral Quals	Arranged with individual faculty members		Existing

No change to course or number
Course renumbering, only
New course and number
Course terminated
Prerequisites updates to reflect new course numbers

Prerequisite Updates for Advanced Graduate Astronomy Courses

Course	Title	Current Prerequisites	Proposed Prerequisites	Rationale
AS751	Interstellar Medium	AS712, 713, 726, OCI*	AS704, 706, OCI	704 is the old 726; 706 is the merger of the old 712 and 713
AS753	Normal Galaxies and the Milky Way	AS712, 713, 725, 726, OCI	AS701, 704, 706, OCI	ditto, plus some material in 725 moved into 701
AS757	High-Energy Astrophysics	AS712, 725, 726, 727, OCI	AS701, 704, 706, 708, OCI	ditto, plus 708 is the old 727
AS759	Cosmology	AS712, 713, 725, 726, OCI	AS701, 704, 706, OCI	ditto
AS781	Planetary Atmospheres	AS726, OCI	AS704, OCI	704 is the old 726
AS783	Ionospheres	AS712, 713, 726, 727, OCI	AS703, 704, 706, 708, OCI	similar to courses listed above, adding 703 core
AS785	Magnetospheres	AS712, 713, 726, 727, OCI	AS703, 704, 706, 708, OCI	ditto
AS786	The Sun and Heliosphere	AS701, 703, 712, 713, 726, 727, OCI	AS701, 703, 704, 706, 708, OCI	ditto

*OCI = "or consent of instructor"

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: Biology and Earth & Environment DATE SUBMITTED: Nov. 1, 2019

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

Advanced Graduate Certificate in Terrestrial Biogeosciences

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

The proposed changes will have no budgetary impact.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): Advanced Graduate Certificate in Terrestrial Biogeosciences

Proposing/Supporting Department: Biology and Earth & Environment

Proposed Start Date: Fall 2020

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Pamela Templer, Director, Biogeosciences Program and Professor, Department of Biology
Email: ptempler@bu.edu | Phone: 617.353.6978

2. Please describe briefly the proposed change to the existing degree:

The proposed change is to rename the certificate program from "Advanced Graduate Certificate in Terrestrial Biogeosciences" to "Advanced Graduate Certificate in Biogeoscience." This change was approved by the Biogeoscience faculty.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

The inclusion of "Terrestrial" in the title of the certificate program does not accurately reflect the program as it currently exists. This change will provide a better representation of the certificate as it broadens the scope to include all Biogeoscience, including freshwater and marine ecosystems. The field of Biogeoscience provides the scientific basis for understanding the role of terrestrial *and* aquatic processes in some of today's most pressing environmental issues, including climate change, deforestation, eutrophication of lakes and rivers, and the effect of sea level rise on coastal and estuarine ecosystems.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

This certificate program has attracted top-caliber graduate students to the programs in Biology and Earth and Environment and stimulated collaborative research among participating faculty and their students. Boston University faculty interested in Biogeoscience bring a depth and breadth of expertise that is unrivaled at peer-and-above institutions in the United States. The department of Biology has faculty expertise in ecosystem science, biogeochemistry and plant biology. The department of Earth & Environment includes faculty expertise in biogeochemistry, hydrology and the geomorphology of land and coastal systems, as well as expertise in the physics of land-atmosphere interaction, physiological ecology, and remote sensing.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

There are no changes to the program requirements.

Current program	Revised program
• GRS 719 Fall Colloquium (2cr)	
• GRS 720 Practicum in Biogeoscience (2cr)	
• One course in Biogeophysics (4cr) o CAS GE 503 Micrometeorology: Energy and Mass Transfer at the Earth's Surface o CAS GE 504 Physical Climatology o CAS ES/GE 514 Dynamic Land Surface Hydrology o CAS GE/BI 525 Plant Physiological Ecology o CAS ES 533 Quantitative Geomorphology o GRS ES/GE 683 Geodynamics II: Fluids and Fluid Transport o GRS GE 507 Dynamical Oceanography o GRS ES 510 Introduction to the Atmospheric Boundary Layer o GRS EE 512 Urban Climate o GRS ES 543 Estuaries and Nearshore Systems	
• One course in Biogeochemistry (4cr) o CAS BI/GE 530 Forest Ecology o CAS ES 576 Aquatic Geochemistry o GRS ES 623 Marine Biogeochemistry o GRS BI/ES 643 Terrestrial Biogeochemistry o GRS BI 648 Biodiversity and Conservation Biology o GRS GE 656 Terrestrial Ecosystems and the Carbon Cycle o CAS GE 675 Urban Ecology o CAS ES 540 Atmospheric Chemistry and Global Change	
• One course in Methods in Biogeoscience: Statistics, Modeling, & Geospatial Sciences (4cr) o CAS GE 501 Advanced Topics in Remote Sensing o CAS GE 502 Field Measurements in Remote Sensing o CAS GE 505 Geographic Information Systems o CAS GE 509 Applied Environmental Statistics o CAS GE 516 Multivariate Analysis for Geographers o CAS GE/BI 529 Modeling and Monitoring Terrestrial Ecosystems Processes o CAS GE 585 Ecological Forecasting and Informatics o GRS ES 620 Aquatic Optics and Remote Sensing o GRS GE 645 Physical Models of Remote Sensing	

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

The current learning outcomes already reflect the name change so no changes will need to be made to the learning outcomes.

Current Learning Outcomes:

- Demonstrate academic mastery in Biogeoscience.
- Attain research expertise and complete original research that advances a specific field of study within the field of Biogeoscience.
- Be prepared to enter the job market.
- Communicate research questions and results to the scientific community and communicate research findings and wider implications of Biogeoscience research to the general public.

7. Please list learning outcomes for the revised program:

This change will not change the current learning outcomes.

8. How does the change place your program in the context of programs at peer institutions?

This change aligns with other institutions that have comparable Certificate or tracks within their degree programs for "Biogeoscience" (e.g., University of California Berkeley, University of Colorado Boulder, Duke University).

9. How does the change affect other academic units and existing programs at the University?

The proposed change does not affect other academic units and programs at the University.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

There are no academic program changes so students should still be able to complete the program requirements as planned. Current students will be notified by the Director once the change is formalized.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

There are currently 24 students enrolled that are completing or recently completed the Biogeoscience Certificate. The students are pursuing PhD degrees in the department of Biology and Earth & Environment. This change is not expected to increase or decrease enrollments.

12.Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

The proposed change has no implications on professional accreditation or licensure at the program or school/college level.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

The proposed changes do not involve the development of a new course or courses.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

The proposed changes require no other resources.

15. Please describe the budgetary impact that the proposed change will have:

The proposed changes will have no budgetary impact.

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes)[NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

There are no changes to the bulletin. The current name is already listed as "Graduate Certificate in Biogeoscience" and reflects the broadness of the program already.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

N/A

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

N/A

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

N/A

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

N/A

Tuition/Fee Item	**Amount**

Examples:

Fulltime Tuition	*$25,490*
Graduate Student Services Fee	*$162*
Health and Wellness Fee	*$206*

or

Program Fee (bundled charge)	*$27,985*
Tuition component	*$21,985*
Fees component	*$6,000*

21. What is the average number of years for a full-time student to complete the program?

The students pursue PhD degrees in the department of Biology and Earth & Environment. The certificate program is designed such that requirements can be fulfilled as part of, and not in addition to, requirements for the PhD degree in the student's home department. Students typically complete the requirements for the certificate in the first few years of their program as they complete their coursework for their PhD. The average time to degree varies by department.

22. What is the maximum number of years allowed to complete the program?

There is no time limit for the completion of the certificate however, students complete the certificate as a component of their PhD degree which does have time limits controlled by the Graduate School of Arts & Sciences.

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

This certificate program is not a stand-alone credit-bearing certificate and is only open to students already enrolled in a participating PhD program at Boston University so students are eligible for funds based on their PhD program.

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

There is no new HEGIS with this proposal.

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

There is no new HEGIS with this proposal.

26. Are you phasing out or replacing another program? If so, what program?

This proposal does not phase out or replace another program.

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): Master's in Bioinformatics

Proposing/Supporting Department: Graduate Program in Bioinformatics

Proposed Start Date: 9/01/2020

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program: David King, Graduate Program Coordinator, dking@bu.edu, 617-358-0751

2. Please describe briefly the proposed change to the existing degree: We propose to make five changes to the required courses in the Bioinformatics Master's Program curriculum. Four of the courses are newly-developed and specific to the Bioinformatics Master's Program: BF751, BF528, BF831, and BF550. One course, BF527, was previously a recommended elective, and now is proposed to be a required course. We also propose to reduce the Graduate Seminar requirement from 2 courses to 1 (4 credits total to 2 credits).

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends: When we originally designed the Bioinformatics Master's curriculum 20 years ago, the required courses were essentially coincident with the courses required for the Bioinformatics Ph.D. Over the years, we noted that Master's applicants increasingly came with backgrounds in the biological sciences, with strong motivation to learn computational and quantitative methods from us in order to qualify them for careers in computational biology and bioinformatics. We found that this cohort of students needed a set of more basic courses in quantitative and computational biology to "bring them up to speed" and equip them to learn the methods and material that they would need in their future careers.

BF550 (Foundations of Programming, Data Analytics, and Machine Learning in Python), to be offered in the Fall semester to entering Bioinformatics Master's students, is designed to introduce the computational and mathematical underpinnings of the Bioinformatics methods that the students will learn and apply in later courses. BF528 (Translational Bioinformatics Applications) is a new Spring semester follow-on to the introductory course BF527, which we have offered for many years. BF528 is designed to allow Bioinformatics Master's students to acquire hands-on experience in analyzing large genomics datasets (RNA-seq, for example), similar to those they will encounter in their future careers. We designed a new course (BF751) focusing on the basics of molecular biology and biochemistry, but geared to applications of biology to Bioinformatics. Finally, we developed a dedicated 2-credit seminar course for Master's students (BF831) in which they learn to read and critically evaluate recent primary literature in Bioinformatics.

A further motivation for this curricular revision is to make it possible for the majority of motivated Master's students to complete the degree in one year, an important consideration for many applicants. In the past, students who entered with less strong backgrounds in quantitative and computational science often had to delay taking more advanced required courses until they had completed additional basic coursework, a disadvantage in recruiting and admissions.

The overall aim of the changes we propose is to bring the Bioinformatics Master's curriculum in line with course requirements at peer institutions, and to meet the needs of future applicants to the program.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University: The proposed changes to the Bioinformatics Master's Program will strengthen the curriculum and thereby lead to advances in at least three areas that are part of the Strategic Plan of the University:

- *To support and enhance a world-class faculty whose members are dedicated to teaching and engaged in research, scholarship, and their professions.* The training we offer is essential for a rapidly growing number of research programs at Boston University, as Biological and Biomedical science continue their evolution into highly quantitative disciplines in the era of Big Data. Recently, the Bioinformatics Program has financially and administratively supported efforts by Dr. Adam Labadorf, a Ph.D. graduate of the Program, to establish a new service that analyzes large scale high-throughput datasets for investigators throughout the University. Dr. Labadorf supervises a team of Bioinformatics Master's students who perform these analyses as part of their required internships.
- *To enhance our nationally recognized professional schools and colleges, including Medicine, Management, Law, and Fine Arts.* The Bioinformatics Program effectively brings together faculty members from the Medical Campus with faculty from Engineering and Arts and Science at the Charles River Campus, to participate together in research projects and graduate training in computational biology.
- *To increase our emphasis on interdisciplinary research and graduate education in order to expand our leadership in important fields and the collaborative atmosphere across our campuses.* The Bioinformatics Program is recognized as an innovator in interdisciplinary graduate education. The extensive collaborative research and teaching network that the

Program fosters is an important contributor to the University's leadership in several areas of modern biomedical science.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes:

Current Requirements	Credits	Revised Program	Credits
CAS BI 552: Molecular Biology	4	**ENG BF 751: Molecular Biology and Biochemistry for Bioinformatics (Osborne)**	4
ENG BE 562: Computational Biology	4	**ENG BF 527: Applications in Bioinformatics (Leyfer)**	4
		ENG BF 528: Translational Bioinformatics Applications (Labadorf)	4
ENG BF 778: Physical Chemistry for Systems Biology	4	**ENG BF 550: Foundations of Programming, Data Analytics and Machine Learning in Python (Korolev)**	4
ENG BF 768: Biological Databases	4	ENG BF 768: Biological Databases	4
ENG BF 821: BF Graduate Seminar (x2)	4	**ENG BF 831: Bioinformatics Masters Seminar (Steiling)**	2
ENG BF 541: Bioinformatics Internship OR ENG BF 501: MS Project	4	ENG BF 541: Bioinformatics Internship OR ENG BF 501: MS Project	2
Two Electives	8	Two Electives	8
	Total: 32		*Total: 32*

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?: We based the proposed curricular changes on an evaluation of the academic strengths of our Master's applicant pool, which we undertook as we prepared the self-study document for our recent Academic Program Review. The proposed changes were also considered in light of the learning outcomes we developed for the Bioinformatics Master's.

7. Please list learning outcomes for the revised program:

- Demonstrate mastery of the core concepts of Bioinformatics, including computational biology, database design and implementation, and probability and statistics.
- Demonstrate the ability to apply skills in a professional environment via a required 400-hour industrial or academic internship in Bioinformatics.
- Be able to effectively communicate scientific information in written and oral form.

8. How does the change place your program in the context of programs at peer institutions?

A recent review of the program requirements of five comparable computational biology programs at peer and peer-plus universities showed similar curricula to our proposal, with a mixture of biology and computational core courses and similar electives.

9. How does the change affect other academic units and existing programs at the University?

There will be no effect on other academic units or existing programs.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

These changes will only affect incoming students. Current students will be able to complete their programs with no difficulty.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments: There currently are 44 students enrolled in the Bioinformatics Master's Program. We do not anticipate substantial increases or decreases in enrollment as the result of the proposed changes.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level: The proposed changes to the Bioinformatics Master's Program will have no effect on accreditation or licensure.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course: Instructors for the newly-proposed courses are noted in the Table in Item 5 above. Two instructors (Dr. Osborne, BF751, and Dr. Labadorf, BF528) are non-tenure-track and teach only this course. Dr. Kirill Korolev (BF550) is an assistant professor in Physics and Bioinformatics. One course of his two-course teaching load is in Bioinformatics. This is his regular assignment. Dr. Katie Steiling is an assistant professor in the School of Medicine, and a faculty member of the Bioinformatics Program. She teaches the BF831 seminar course as an overbase assignment. All instructional costs are already included in the Bioinformatics base budget or in our discretionary (tuition return) budget, so there will be no additional costs associated with the proposed curricular revision.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget: None

15. Please describe the budgetary impact that the proposed change will have: None

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

MS in Bioinformatics

The emphasis of the MS in Bioinformatics program is preparation for careers that involve using bioinformatics in research or in the biotechnology or pharmaceutical industries. In order to be admitted, students need at least a bachelor's degree in a field related to bioinformatics. Typically students enrolling in the MS program have strength in either the computational area or in biochemistry/molecular biology, but not both.

Learning Outcomes

Students graduating with an MS in Bioinformatics are expected to:

- Demonstrate mastery of the core concepts of Bioinformatics, including computational biology, database design and implementation, and probability and statistics.
- Demonstrate the ability to apply skills in a professional environment via an industrial or academic internship in Bioinformatics.
- Be able to effectively communicate scientific information in written and oral form.

Course Requirements

The master's degree requires 32 credits of coursework. In order to receive a master's degree, students must demonstrate mastery of the required subject matter (no lower than a B in all required courses). Course requirements are as follows:

- ENG BF 751: Molecular Biology and Biochemistry for Bioinformatics (4 cr)
- ENG BF 527: Applications in Bioinformatics (4 cr)
- ENG BF 528: Translational Bioinformatics Applications (4 cr)
- ENG BF 550: Foundations of Programming, Data Analytics and Machine Learning in Python (4 cr)
- ENG BF 768 Biological Database Systems (4 cr)
- ENG BF 831: Bioinformatics Master's Seminar (2 cr)
- ENG BF 541 Bioinformatics Internship OR ENG BF 501 Master's Project (2 cr)

Fulfillment of required course equivalents will be determined based on documented previous academic and/or work experience. The student and his or her advisor will petition the curriculum committee for such equivalencies. When either past work or an alternate course has been accepted as a core equivalent, the student's advisor will recommend other courses to fulfill the 20 core credit hours. Advanced elective courses should be taken in place of any waived course requirements.

The remaining credits needed to complete the requirements for the MS degree will consist of electives and/or additional research projects.

Language Requirement

There is no foreign language requirement for this degree.

Internship

Students must demonstrate a working knowledge of computational methods available to the modern bioinformatician by completing an internship as part of their degree requirements. For information on internship requirements and guidelines, please see the Bioinformatics website.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

Not applicable

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

This is not applicable to the changes we are requesting.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

This is not applicable to the changes we are requesting.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

This is not applicable to the changes we are requesting.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

This is not applicable to the changes we are requesting.

21. What is the average number of years for a full-time student to complete the program?

1.3 years

22. What is the maximum number of years allowed to complete the program?

4 years

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

This is not applicable to the changes we are requesting.

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

This is not applicable to the changes we are requesting.

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

This is not applicable to the changes we are requesting.

26. Are you phasing out or replacing another program? If so, what program?

No

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): Ph.D. in Bioinformatics

Proposing/Supporting Department: Graduate Program in Bioinformatics

Proposed Start Date: 9/01/2020

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

David King, Graduate Program Coordinator, dking@bu.edu, 617-358-0751

2. Please describe briefly the proposed change to the existing degree:

We propose to replace two currently-required courses (BF751 Molecular Biology & Biochemistry, and BF768 Biological Databases) with two "core" courses (a Biology core course and a Comp/Math core course) that students will choose from a list of possibilities. We propose to remove two required courses from the current curriculum: BF778 (Physical Chemistry for Systems Biology) and BE777 (Computational Genomics). Finally, we propose to change the Graduate Seminar requirement (BF821) from two required seminars to one seminar.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

When the BU Bioinformatics Ph.D. Program was established 20 years ago, research in genomics was the major focus of the training faculty. The curriculum was designed to support this research emphasis. As the Program grew over subsequent years, newly-added faculty members broadened the research enterprise of the Program. New areas of investigation included biological networks, the microbiome, and translational applications of Bioinformatics to biomedicine. The expanded research agenda of the

Bioinformatics Program led to the proposed curricular changes detailed here. The central change we propose is to exchange two formerly required courses (BF751 Molecular Biology & Biochemistry, and BF768 Biological Databases) for two "core" courses to be chosen by the students from a list of recommended courses (please see the list of "core" courses below the Table in item 5 below). One "core" course in Biology and one "core" course in Comp/Math will now be required. The aim of this change is to allow Bioinformatics Ph.D. students to choose courses in Biology and Math/Computation that best prepare them for the particular research area that will be the focus of their dissertation. The list of "core" courses will be evaluated regularly to provide a range of options consistent with the research directions of Bioinformatics faculty.

The proposed curricular changes also include removing from the list of required courses BE777 Computational Genomics and BF778 Physical Chemistry for Systems Biology, courses that are no longer taught regularly.

These changes will result in a curriculum that is more flexible for our Ph.D. students. This streamlining of the curriculum was partly in response to the review of our NIH Training Grant two years ago, which noted that the number of required course credits seemed excessive compared to other graduate programs in Computational Biology and Bioinformatics.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

The proposed changes to the Bioinformatics Ph.D. Program will strengthen the curriculum and thereby lead to advances in at least four areas that are part of the Strategic Plan of the University:

- *To support and enhance a world-class faculty whose members are dedicated to teaching and engaged in research, scholarship, and their professions.* The Bioinformatics Program performs a unique role at Boston University, as the source of Ph.D. trainees who pursue research projects involving bioinformatics and computational biology. The training we offer is essential for a rapidly growing number of research programs at Boston University, as Biological and Biomedical science continue their evolution into highly quantitative disciplines in the era of Big Data.
- *To enhance our nationally recognized professional schools and colleges, including Medicine, Management, Law, and Fine Arts.* The Bioinformatics Program effectively brings together faculty members from the Medical Campus with faculty from Engineering and Arts and Science at the Charles River Campus, to participate together in research projects and graduate training in computational biology.
- *To strengthen scholarship and research throughout the University by support of key disciplinary graduate programs.* Bioinformatics trainees work alongside graduate students from a wide range of disciplines in departments throughout the University, bringing expertise in quantitative biology to those labs.
- *To increase our emphasis on interdisciplinary research and graduate education in order to expand our leadership in important fields and the collaborative atmosphere across our campuses.* The Bioinformatics Program is recognized as an innovator in interdisciplinary graduate education. The extensive collaborative research and teaching network that the Program fosters is an important contributor to the University's leadership in several areas of modern biomedical science.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes:

Current Requirements	Credits	Revised Program	Credits
ENG BE 562: Computational Biology	4	ENG BE 562: Computational Biology	4
GRS MA 681: Accelerated Intro to Statistical Methods for Quantitative Research	4	GRS MA 681: Accelerated Intro to Statistical Methods for Quantitative Research	4
ENG BF 752: Legal & Ethical Issues of Science & Technology	4	ENG BF 752: Legal & Ethical Issues of Science & Technology	4
ENG BF 751: Molecular Biology & Biochemistry	4	**choose one Biology core course from list below**	4
ENG BF 768: Biological Databases	4		
ENG BF 778: Physical Chemistry for Sys Bio	4	**choose one Comp/Math core course from list below**	4
ENG BF 690: BF Challenge Project (fall and spring)	4	ENG BF 690: BF Challenge Project (fall and spring)	4
ENG BF 821: BF Graduate Seminar	2	ENG BF 821: BF Graduate Seminar	2
ENG BF 821: BF Graduate Seminar	2	**remove**	0
ENG BF 820: Research Opportunities	1	ENG BF 820: Research Opportunities	1
ENG BF 810: Lab Rotation System (x3)	1 each; 3 total	ENG BF 810: Lab Rotation System (x3)	1 each; 3 total
A minimum of 2 research credits	2	A minimum of 2 research credits	2
ENG BE 777: Computational Genomics	4	**remove**	
One elective	4	One elective	4
Additional electives or research credits	18	Additional electives or research credits	28
	Total: 64		*Total: 64*

CORE COURSES

Biology (choose one):
CAS BI 565: Functional Genomics (Fuxman-Bass)
ENG BF 751: Molecular Biology and Biochemistry for Bioinformatics (Osborne)

Comp/Math (choose one):
ENG BF 571: Dynamics and Evolution of Biological Networks (Segrè)
ENG BF 768: Biological Database Systems (Benson)
GRS MA 770: Mathematical and Statistical Methods of Bioinformatics (Kon)
CAS CS 542: Machine Learning (instructor varies)

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

We based the proposed curricular changes on an evaluation of the expanded research breadth of Bioinformatics-associated faculty, which we undertook as we prepared the self-study document for our recent Academic Program Review. We also incorporated suggestions from the review of our most recent NIH training grant application. The proposed changes were considered in light of the learning outcomes we developed for the Bioinformatics Ph.D.

7. Please list learning outcomes for the revised program:

- Demonstrate mastery of the core concepts of Bioinformatics. These include (a) advanced methods in computational biology, (b) the chemical principles that underlie biochemistry, molecular biology and genomics, (c) the design and implementation of relational databases, (d) fundamental methods in probability and statistics, and (e) the construction of predictive mathematical models of biological systems.
- Be capable of using critical thinking and research methods in Bioinformatics to understand computational and experimental data. In addition to formal course work, this ability will be learned and demonstrated in (a) dissertation research and (b) presentations at scientific meetings, graduate seminars, student seminars, and qualifying examinations.
- Demonstrate the ability to produce and present original research in Bioinformatics. The most important manifestation of this outcome is publication of peer-reviewed research papers on dissertation research, and, in particular, papers with the trainee as first author. The Challenge Project, seminar presentations, and presentations at meetings also demonstrate this outcome.
- Conduct scholarly activities in a professional and ethical manner.
- Develop the ability to communicate clearly the meaning, potential impacts and risks associated with one's research activities to a non-technical audience in ways that confer a sense of its value to society.

8. How does the change place your program in the context of programs at peer institutions?

A recent review of the program requirements of five comparable computational biology Ph.D. programs at peer and peer-plus universities showed similar curricula to our proposal, with a mixture of biology and computational core courses and similar electives.

9. How does the change affect other academic units and existing programs at the University?

There will be no effect on other academic units or existing programs.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

These changes will affect only incoming students. The course changes for continuing students will be minimal, as there is only one course that has been removed from the bulletin.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the

numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

There are currently 52 students enrolled in the Bioinformatics Ph.D. Program. There are no anticipated changes to future program enrollment numbers, because admission to the Ph.D. program is predicated on the availability of first-year fellowships (5 from our NIH training grant, and 6 from the University).

12.Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

The proposed changes to the Bioinformatics Ph.D. Program will have no effect on accreditation or licensure.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

No new courses are proposed. The major proposed change, offering Ph.D. students the choice of one Biology and one Comp/Math core course, makes use of existing courses. The two courses that are proposed to be removed from the Ph.D. curriculum (BF778 and BE777) are no longer taught regularly.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget: None

15. Please describe the budgetary impact that the proposed change will have: None

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

PhD in Bioinformatics

The PhD in Bioinformatics program offers unique interdisciplinary training for graduate students in the science, engineering, medicine, and ethics of twenty-first-century cell biology jointly through the College of Engineering and the Graduate School of Arts & Sciences. The program aims to prepare top researchers for careers in both academia and

industry in the areas of molecular life sciences. In order to be admitted, students need at least a bachelor's degree in a field related to bioinformatics, preferably one with a strong component in mathematics and computer science.

Learning Outcomes

Students graduating with a PhD in Bioinformatics are expected to:

- Demonstrate mastery of the core concepts of Bioinformatics: These include (a) advanced methods in computational biology, (b) the chemical principles that underlie biochemistry, molecular biology and genomics, (c) the design and implementation of relational databases, (d) fundamental methods in probability and statistics, and (e) the construction of predictive mathematical models of biological systems.
- Be capable of using critical thinking and research methods in Bioinformatics to understand computational and experimental data. In addition to formal course work, this ability will be learned and demonstrated in (a) dissertation research and (b) presentations at scientific meetings, graduate seminars, student seminars, and qualifying examinations.
- Demonstrate the ability to produce and present original research in Bioinformatics. The most important manifestation of this outcome is publication of peer-reviewed research papers on dissertation research, and, in particular, papers with the trainee as first author. The Challenge Project, seminar presentations, and presentations at meetings also demonstrate this outcome.
- Conduct scholarly activities in a professional and ethical manner.
- Develop the ability to communicate clearly the meaning, potential impacts, and risks associated with one's research activities to a non-technical audience in ways that confer a sense for its value to society.

Course Requirements

The PhD requires a total of 64 course credits, consisting of the 36 required credits listed below, or their equivalents, and additional elective lecture, laboratory, and research credits. The precise course of study will be determined in consultation with faculty advisors and will reflect the student's background and interests. In order to be admitted to PhD candidacy, students must demonstrate mastery of the required subject matter (no lower than a B in each of the required courses). Course requirements are as follows:

- ENG BE 562 Computational Biology: Genomes, Networks, Evolution (4 cr)
- GRS MA 681 Accelerated Introduction to Statistical Methods for Quantitative Research (4 cr)
- Choose one Comp/Math core course:
    - ENG BF 571: Dynamics and Evolution of Biological Networks (4 cr)
    - ENG BF 768 Biological Database Systems (4 cr)
    - GRS MA 770: Mathematical and Statistical Methods of Bioinformatics (4 cr)
    - CAS CS 542: Machine Learning (4 cr)
- Choose one Biology core course
    - ENG BF 751 Molecular Biology and Biochemistry: Molecules and Processes (4 cr)
    - CAS BI 565: Functional Genomics (4 cr)
- ENG BF 690 Bioinformatics Challenge Project (2 cr each; 4 total)
- ENG BF 752 Legal and Ethical Issues of Science and Technology (4 cr)
- ENG BF 810 Laboratory Rotation System (1 cr each, 3 total)
- ENG BF 820 Research Opportunities in Bioinformatics (1 cr)
- ENG BF 821 Bioinformatics Graduate Seminar (2 cr)
- One non-research elective course (4 cr)
- A minimum of 2 research credits

Fulfillment of required course equivalents will be determined based on documented previous academic and/or work experience. The student and his or her advisors will petition the curriculum committee for such equivalencies. When either past work or an alternate course has been accepted as a required course equivalent, the student's advisors will recommend another course to fulfill the 36 core credit hours. Advanced elective courses should be taken in place of any waived course requirements.

Qualifying Examination

Students must pass an oral qualifying exam in order to advance to the level of PhD candidacy. The goal of the exam is for the student to demonstrate his or her general proficiency in bioinformatics, as well as command of the area(s) in which he or she intends to conduct research. All parts of the qualifying examination must be passed before the

dissertation or thesis prospectus will be accepted by the Graduate School of Arts & Sciences.

Students must schedule their qualifying exam by March 31 of their second year, and must take the exam by June 30. Students who fail to pass the exam on their first try are allowed a second attempt, to be scheduled and completed by the end of the first semester of their third year.

Language Requirement

There is no foreign language requirement for the bioinformatics degree. However, basic mastery of spoken and written English, as determined by oral presentations, written reports, and publishable manuscripts, is a requirement for the PhD.

Dissertation and Final Oral Examination

Candidates shall demonstrate their abilities for independent study in a dissertation representing original research or creative scholarship. A prospectus for the dissertation must be completed and approved by the readers, the director of graduate studies, and the department chair/program director. Candidates must undergo a final oral examination in which they defend their dissertations as a valuable contribution to knowledge in their field and demonstrate a mastery of their field of specialization in relation to their dissertation. All portions of the dissertation and final oral examination must be completed as outlined in the GRS General Requirements for the Doctor of Philosophy Degree.

Students who complete the required core courses but are unable to successfully complete all of the requirements for the PhD will be eligible to be awarded a master's degree.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

Not applicable

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

This is not applicable to the changes we are requesting.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

This is not applicable to the changes we are requesting.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

This is not applicable to the changes we are requesting.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

This is not applicable to the changes we are requesting.

21. What is the average number of years for a full-time student to complete the program?

5 years

22. What is the maximum number of years allowed to complete the program?

8 years

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

This is not applicable to the changes we are requesting.

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

This is not applicable to the changes we are requesting.

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

This is not applicable to the changes we are requesting.

26. Are you phasing out or replacing another program? If so, what program?

No

BOSTON UNIVERSITY

Office of the Provost

Proposed New Degree or Credit-Bearing Certificate: Academic Component

NOTE: The Library Impact Statement is required for the review of a new degree program. Proposers should contact the Library as early in the proposal development process as possible.

Title of Degree or Credit-Bearing Certificate (e.g., Bachelor of Arts in History): Master of Science in Biostatistics

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Professor Howard Cabral, Co-Director of Graduate Studies, hjcab@bu.edu, 617-358-2645

Associate Professor Laura White, Co-Director of Graduate Studies, lfwhite@bu.edu, 617-358-2519

2. Please briefly describe the proposed new degree:

The proposed "dissolution of degree program" is a substantive but minor change to the title of our existing academic Master's program in Biostatistics. The proposed title change will convert the MA title to MS and will eliminate the negative language associated with the existing title, such that our academic "MA:" (32 course credits)" becomes "MS" (32 course credits. This change has been approved by the our Biostatistics Program Advisory Committee, the Biostatistics and Mathematics/Statistics department chairs as well as the Dean of the School of Public Health. The goal of the proposed change is to enhance the visibility, standing, and enrollment in our academic Master's program.

3. Please provide a rationale for the proposed new degree:

The rationale for the proposed "new degree" is that the change will remove the negative connotation that currently comes with the MA title relative to the MS title that we have gleaned from communication with prospective and current students and alumni.

4. Please describe how the proposed new degree advances the Strategic Plans of the department, school/college, and University:

We anticipate that this change will facilitate the growth of the Biostatistics Program academic Master's degree program, consistent with the strategic plan of the departments (Biostatistics and Mathematics/Statistics, the Graduate Scholl of Arts and Sciences, and the University.

5. Please list the program requirements for the proposed new degree (denote new courses in bold print and courses already approved for conveying Hub units with an asterisk). New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf:

Current program	Revised program
• MA (with 32 credits of coursework and 2 comprehensive examinations)	MS (with same 32 credits of coursework and 2 comprehensive examinations)

6. Please list program learning outcomes: [http://www.bu.edu/provost/planning/program-learning-outcomes-assessment/]

A candidate for a Master of Science degree in Biostatistics is expected to demonstrate mastery of knowledge in biostatistics by:
Demonstrating mastery at a Master's level of biostatistical theory and application through high achievement in course work and on written comprehensive examinations;
Demonstrating commitment to advancing the values of scholarship by keeping abreast of current advances within biostatistics and showing commitment to personal professional development through engagement in professional societies and publication;
Conducting scholarly work in a professional and ethical manner guided by the principles of the profession.

7. For master's or professional doctorate degrees, please describe what this program prepares students for after they have graduated:

This master's program prepares students for jobs in biostatistics and data science positions in in the biotechnology and pharmaceutical industries, academic research, and governmental health and science agencies, as well future study at the doctoral level in biostatistics.

8. Please describe how the proposed new degree relates to existing programs at the University: [*Please upload cognate letters separately*.]

The proposed "new degree" is a substantive, but minor, change to the title of the existing Biostatistics academic MA degree. The proposed title changes will convert the MA title to MS and eliminate the negative language associated with the MA title. The new MS degree will be constituted by exactly the same credit, course, and comprehensive examination requirements University in the same way as the prior MA degree.

9. Please place the proposed program in the context of comparable programs at appropriate peer institutions (AAU peer institutions and disciplinary peers):

The proposed "new degree", i.e., the title change from MA to MS, would mean that the title of our program is consistent with the program offered at many of our peer and peer plus institutions (e.g., Johns Hopkins University, Harvard University, Emory University, the University of North Carolina, Columbia University, and the University of Michigan).

10. Please list the program's faculty:

Beiser, Cabral, Carvalho, Castrillon, M. Chang, Cheng, Colton, Cupples, D'Agostino,
Demissie, DeStefano, Doros, Dukes, Dupuis, Eden, Fish, Gagnon, Gangopadhyay,
Ginovyan, Heeren, Hicks, Jenkins, Kim, Kolaczyk, Kon, Larson, LaValley,
Lew, Lok, C. Liu, C. T. Liu, Lodi, Lunetta, Massaro, Nelson, Patil, Peloso,
Preis, Salins, Sebastiani, Spiliopoulos, Sullivan, Taqqu, Trinquart,
Tripodis, Weinberg, Weiner, White, Yang, Zhang

11. Please provide an administrative plan for the proposed new degree:

The proposed "new degree" is a substantive, but minor, change to the title of the existing Biostatistics program and converts the MA title to MS title. The administrative plan will remain the same.

12. Please provide an advising plan for the proposed new degree:

The proposed "new degree" is a substantive, but minor, change to the title of the existing Biostatistics program and converts the MA title to MS title. The advising plan will remain the same.

13. For a proposed graduate program, please provide the admissions standards involved:

The proposed "new degree" is a substantive, but minor, change to the title of the existing Biostatistics program and converts the MA title to MS title. The admission standards will remain the same.

14. Please document any implications that the formation of the proposed new degree has on professional accreditation or licensure at the program or school/college level:

The proposed change will have no implications on professional accreditation or licensure at the program or school/college level.

15. For a proposed undergraduate program, please provide sample 4-year plans through the new degree or certificate:

NA

16. If the new program includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course [NOTE: new courses will need Course Inventory Forms submitted to the Office of the Registrar]:

The proposed change does not involve the development of a new course or courses.

17. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

The proposed changes require no other resources.

18. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured?

The proposed "new degree" is a substantive, but minor, change to the title of the existing Biostatistics program and converts the MA title to MS title. The tuition and fees will remain the same.

19. Please describe the proposed enrollment or the enrollment required to cover the start-up costs of the proposed new degree:

As of the Spring 2019 semester, 5 students were enrolled in our Master's program (3 in year one and 2 in year two). We anticipate that this change will increase enrollments, but we are able to control the increase in enrollments. We anticipate markedly increasing the headcount of students admitted in the first year over time, with 10 students starting the program in the Fall 2019 semester. These students will be distributed across all faculty and upper level classes in Biostatistics curriculum, and can be accommodated without additional support.

20. Please provide the bulletin copy (exactly as it will appear) for the proposed new degree including all text connected to the program (requirements, description, program goals/outcomes)[NOTE: this bulletin copy is in a final form and cannot be changed. It must include program learning outcomes]:

Please see attached.

21. Please submit a complete budget for the new program or credit-bearing certificate, using the appropriate budget template, even if no additional resources are needed.

The proposed "new degree" is a substantive, but minor, change to the title of the existing Biostatistics program and converts the MA title to MS title. The budget will remain the same.

http://www.bu.edu/academics/grs/programs/biostatistics/ms/

MS in Biostatistics

The Master of Science in Biostatistics program is aimed primarily at students with the equivalent of a bachelor's degree who wish to pursue advanced study in the theory and methods of biostatistics. The program prepares students to function as collaborators on research projects in academia, industry, or government, and prepares students for doctoral programs in biostatistics or other quantitative areas of health research.

Learning Outcomes

A candidate for a Master of Arts degree in Biostatistics is expected to demonstrate mastery of knowledge in biostatistics by:

- Demonstrating mastery at a master's level of biostatistical theory and application through high achievement in coursework and on written comprehensive examinations.
- Demonstrating commitment to advancing the values of scholarship by keeping abreast of current advances within biostatistics and showing commitment to personal professional development through engagement in professional societies and publication.
- Conducting scholarly work in a professional and ethical manner guided by the principles of the profession.

Course Requirements

Students must earn a minimum grade of B– in all courses that are to be applied to the degree. Students in the MA program must complete a total of 32 credits. Course requirements are as follows:

- CAS MA 575 Linear Models
- CAS MA 581 Probability **or** MET MA 581 Probability
- CAS MA 582 Mathematical Statistics **or** MET MA 582 Mathematical Statistics
- SPH EP 770 Concepts and Methods in Epidemiology
- SPH BS 805 Intermediate Statistical Computing and Applied Regression Analysis or SPH BS 806 Multivariable Analysis for Biostatisticians
- SPH BS 852 Statistical Methods for Epidemiology
- SPH PH 700 Foundations of Public Health
- A minimum of 8 credits selected from the list of electives on the program website

Language Requirement

There is no foreign language requirement for this degree.

Comprehensive Examinations

The MS candidate must satisfactorily pass two comprehensive written examinations upon completion of coursework. These will require proficiency in the material covered in the six core courses. Students are allowed two attempts to pass a qualifying exam. The Biostatistics Qualifying Exam Committee will evaluate requests by students to take an exam for the third time on a case-by-case basis.

OVERVIEW OF THE MS DEGREE

The Master of Science in Biostatistics program is aimed primarily at students with the equivalent of a Bachelor's degree who wish to pursue advanced study in the theory and methods of biostatistics. The program prepares students to function as collaborators on research projects in academia, industry or government, and prepares students for doctoral programs in biostatistics or other quantitative areas of health research.

MS LEARNING OUTCOMES

A candidate for a Master of Science degree in Biostatistics is expected to demonstrate mastery of knowledge in biostatistics by

- Demonstrating mastery at a Master's level of biostatistical theory and application through high achievement in course work and on written comprehensive examinations.
- Demonstrating commitment to advancing the values of scholarship by keeping abreast of current advances within biostatistics and showing commitment to personal professional development through engagement in professional societies and publication.
- Conducting scholarly work in a professional and ethical manner guided by the principles of the profession.

MS DEGREE REQUIREMENTS

The Graduate School or Arts & Sciences requires students pursuing a Master of Science in Biostatistics to:

- Complete the 32-credit curriculum
- Fulfill the Residency Requirement
- Fulfill the Grade Requirement
- Pass both the Theory and Applied Biostatistics Qualifying Examinations
- Complete the MS degree within 3 years of matriculation to the program

MS CURRICULUM

Students in the MS program must complete a total of 32 credits as follows:

Course #	Course Title	When Offered
1. Six Core Courses, required (24 credits):		
CAS MA575	Linear Models	Fall
CAS/MET MA581	Probability	Fall/Spring

CAS/MET MA582	Mathematical Statistics	Fall/Spring
SPH EP770	Concepts and Methods in Epidemiology	Fall/Spring
SPH BS805 or SPH BS806	Intermediate Statistical Computing & Applied Regression Multivariable Analysis for Biostatisticians	Fall/Spring/ Summer Fall
SPH BS852	Statistical Methods in Epidemiology	Fall/Spring
2. Elective Courses (8 credits):		
CAS MA576	Generalized Linear Models	Spring
CAS MA583	Introduction to Stochastic Processes	Spring
CAS MA585	Time Series Modeling and Forecasting	Spring
CAS MA588	Nonparametric Statistics	Spring
CAS MA589	Computational Statistics	Fall
CAS MA592	Introduction to Causal Inference	Fall (every other year)
GRS MA685	Advanced Topics in Applied Statistical Analysis	Fall
GRS MA751#	Statistical Machine Learning	Spring
GRS MA781*	Estimation Theory	Fall
GRS MA782*	Hypothesis Testing	Spring
GRS MA861*	Seminar: Applied Mathematics	
GRS MA881*	Seminar: Statistics	
GRS MA882	Seminar: Statistics (Limit 4 credits)	Fall/Spring
CAS CS542#	Machine Learning	Fall, Spring, Summer
SPH BS722	Design and Conduct of Clinical Trials	Fall/Spring
SPH BS728	Public Health Surveillance, a Methods Based Approach (2 cr)	Fall
SPH BS775	Applications of Statistical Methods in Clinical Research	Alt Springs (even years)
SPH BS810	Meta-analysis for Public Health and Medical Research	Fall
SPH BS820	Logistic Regression/Survival Analysis	Spring
SPH BS821	Categorical Data Analysis	Fall
SPH BS825	Advanced Infectious Disease Epidemiology (2 credits)	Fall
SPH BS831	Genomics Data Mining and Statistics (2 credits)	Spring
SPH BS845	Applied Statistical Modeling & Programming in R	Fall
2. Elective Courses (8 credits; *continued*):		
SPH BS849	Bayesian Modeling for Biomedical Research & Public Health (2 credits)	Spring
SPH BS851	Applied Statistics in Clinical Trials I	Fall/Spring
SPH BS853	Generalized Linear Models with Applications	Spring
SPH BS854	Bayesian Methods in Clinical Trials	Alt Falls (odd years)
SPH BS856	Adaptive Designs for Clinical Trials	Alt Springs (odd

		years)
SPH BS857	Analysis of Correlated Data	Spring
SPH BS858	Statistical Genetics I	Fall
SPH BS859	Applied Genetic Analysis	Alt Springs (odd years)
SPH BS860	Statistical Genetics II	Alt Springs (even years)
SPH BS861	Applied Statistics in Clinical Trials II	Spring
SPH BS901**	Directed Study in Biostatistics	TBD
SPH BS902**	Directed Research in Biostatistics	TBD
SPH EP854*	Modern Epidemiology	Fall

* Must obtain permission from academic advisor and/or instructor to take this course as an elective.

Only one of these two courses may count as an elective

** A maximum of 4 credits is allowed across these two courses.

MS PROGRAM REQUIREMENTS AND POLICIES

Residency Requirements: Students must be registered in both the semester in which the last degree requirements are completed and in the preceding semester. For example, if a student plans to complete their degree requirements in the Spring of 2020, s/he must be registered in both Spring 2020 and Fall 2019.

Grade Requirements: Students must earn a grade of B- or better in all courses applied to the degree.

Qualifying Examinations:

The MS candidate must satisfactorily pass two comprehensive written examinations upon completion of coursework. These will require proficiency in the material covered in the six core courses.

The Biostatistics Theory Qualifying Examination is given in the spring semester. Candidates must satisfactorily answer four of six questions based on material covered in MA581 and MA582. The Biostatistics Applied Qualifying Examination is given in December and in April each year. Candidates must satisfactorily answer a total of four questions based on material covered in MA575, BS805/BS806, and BS852 with at least one question from each of the three course areas.

Students can use one single-sided reference sheet (printer size [8.5in x 11in] or smaller, handwritten or typed) in the Applied examination. A reference sheet is not allowed in the Theory examination. The reference sheet will be collected at the end of the exam.

Students are strongly urged to meet with their advisors to discuss preparation for the Qualifying Examinations. Students are allowed two attempts to pass a Qualifying Exam. The Biostatistics Qualifying Exam Committee will evaluate requests by students to take an exam for the third time on a case-by-case basis.

Important Note: For May graduates only, diplomas will be available at the commencement ceremonies. Otherwise, approximately one month following the date of graduation and depending on a student's preference, the diploma is either available for pick-up from the Diploma Office at the Office of the University Registrar, 881 Commonwealth Avenue, or it will be mailed to the address specified on the Diploma Dispersal form that is submitted with the Diploma Application.

Policies
All students must adhere to all Boston University Graduate School of Arts & Sciences academic policies; and the University's Administrative Policies. Note that this information may change at any time.

MS GRADUATION

Please review the detailed graduation timeline and procedures on the GRS Dissertation and Graduation Procedures webpage. Note that several steps, including the Intent to Graduate form, must be taken well in advance of the intended graduation date. It is the student's responsibility to keep track of all graduation procedures.

Master of Science students in Biostatistics are eligible and invited to participate in both the GRS and SPH Commencement ceremonies. Many students choose to participate in only the SPH ceremony. Students must register in advance for each Commencement ceremony in which they plan to participate. Information and instructions about Commencement will be sent directly from SPH and GRS. It is the student's responsibility to keep track of all Commencement ceremony procedures.

BOSTON UNIVERSITY

Office of the Provost

Proposed Dissolution of an Existing Credit-Bearing (Major, Minor, Certificate, or Degree) Program: Academic Component

Title of Existing Program (e.g., Bachelor of Arts in History): Master of Arts in Biostatistics

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Professor Howard Cabral, Co-Director of Graduate Studies, hjcab@bu.edu, 617-358-2645

Associate Professor Laura White, Co-Director of Graduate Studies, lfwhite@bu.edu, 617-358-2519

2. Please provide the rationale for the proposed dissolution of the major or degree program:

The proposed "dissolution of degree program" is a substantive but minor change to the title of our existing academic Master's program in Biostatistics. The proposed title changes will convert the MA title to MS and will eliminate the negative language associated with the existing title, such that our academic "MA:" (32 course credits)" becomes "MS" (32 course credits. This change has been approved by the our Biostatistics Program Advisory Committee, the Biostatistics and Mathematics/Statistics department chairs as well as the Dean of the School of Public Health. The goal of the proposed change is to enhance the visibility, standing, and enrollment in our academic Master's program.

3. Please provide the proposed timetable for the phase-out of the dissolved major or degree program:

The change is proposed to occur in the summer of 2021, such that students applying to our academic Master's program in the fall of 2021 will be applying to the MS.

4. Please describe the current student body (number of students by year) of the major or degree program and the trajectory of those student cohorts as the program is dissolved. As current students must be allowed to complete the program under the requirements in place when they entered the program, please indicate how that will be achieved and how you plan to communicate options to the current students:

As of the Spring 2019 semester, 5 students were enrolled in our MA (3 in year one and 2 in year two, with 10 who have accepted our offer of enrollment in the Fall 2019 semester). Given that the proposed "dissolution of degree program" is accompanied by a proposed creation of a "new degree" program that is identical in all respects, apart from being called MS rather than MA, our current students will be able to complete the program under the requirements in place when they entered the program. If standing students wish to receive an MS rather than an MA after the change of title they will be able to request that.

5. Please describe the budgetary impact that the proposed dissolution will have:

The proposed dissolution will have no budgetary impact because it is accompanied by a proposed creation of a new degree program that is identical in all respects. We anticipate that this change will facilitate the growth of the academic Master's program in Biostatistics.

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: CAS Earth & Environment DATE SUBMITTED: 11/1/19

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

Master of Science in Energy & Environment to replace the Master of Arts in Energy & Environment

Will this course/minor/program create a need for:

Yes / No

no	**Space/Renovations (office or classroom)?**
no	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
no	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): MS in Energy & Environment

Proposing/Supporting Department: CAS Earth & Environment

Proposed Start Date: Fall 2021

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Professor Robert Kaufmann

kaufmann@bu.edu

617-353-5746

2. Please describe briefly the proposed change to the existing degree:

Change degree conferred from a Master's of Arts to a Master's of Science.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Conversion of this degree is intended to achieve three key objectives; to more accurately convey the nature of the degree program, to better align the degree program with market demand in the Energy and Environmental field, and to maintain competitiveness with institutions offering degree programs in the field.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

Both the department of Earth and Environment and Graduate School of Arts and Sciences have targeted growth in our professional MA programs as an immediate, as well as long term, goal. Conversion of this degree program from a MA to a MS is a more accurate reflection of the quantitative nature of the degree program but also will make the program more competitive with peer institutions while improving the marketability of degree recipients.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

There are no changes to the program requirements.

Current program	Revised program
Required: CAS GE 516 Multivariate Analysis for Geographers	Required: CAS GE 516 Multivariate Analysis for Geographers
Required: CAS GE 519 Energy, Society, and the Environment	Required: CAS GE 519 Energy, Society, and the Environment
Required: GRS GE 620 Methods of Environmental Policy Analysis	Required: GRS GE 620 Methods of Environmental Policy Analysis
Required: GRS GE 660 Food, Energy, and Water Policy	Required: GRS GE 660 Food, Energy, and Water Policy
Required: CAS GE 555 World Oil Markets or QST PL 852 Electricity Markets	Required: CAS GE 555 World Oil Markets or QST PL 852 Electricity Markets

Required: CAS GE 712 Regional Energy Modeling or GE 550 Modeling Environmental and Social Systems	Required: CAS GE 712 Regional Energy Modeling or GE 550 Modeling Environmental and Social Systems
Electives: 2 chosen in consultation with advisor	Electives: 2 chosen in consultation with advisor

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

Formal and informal feedback from current and former students reveals a desire for this change of degree designation. Both groups report that the market 'values' an MS more than an MA. As such, converting the degree to an MS makes the program more appealing to potential applicants.

7. Please list learning outcomes for the revised program:

There are no changes to the learning outcomes.

- Demonstrate a thorough understanding of (a) one or more current energy and/or environmental issues along multiple dimensions (resources, technologies, and markets), and their relationship of these dimensions to (b) fundamental concepts from economics and other social science disciplines (e.g., political science/international relations, or law), and (c) fundamental concepts from natural science
- Demonstrate knowledge of quantitative and qualitative theoretical frameworks and methodological approaches used to analyze environmental problems and understand the effectiveness of policy interventions
- Quantitatively analyze data and perform simulation modeling to characterize the impacts of energy and environmental policies on human systems
- Communicate effectively, verbally and in writing, concepts in the natural and social sciences as they relate to environmental issues, and demonstrate a thorough understanding of the broader societal consequences of one or more environmental problems and policies
- Apply analytical techniques from statistics, spatial science, and economics to solve qualitative and quantitative problems in the design and implementation of policies to address environmental issues

8. How does the change place your program in the context of programs at peer institutions?

Converting the degree to an MS will make our program more consistent with those offered by other universities such as Berkeley, Stanford, Yale, Duke, University of Chicago, University of North Carolina, University of Oregon, among numerous others, and consequently more competitive.

9. How does the change affect other academic units and existing programs at the University?

This change will impact the BA/MA degree offered through the department of Earth and Environment which will need to change to a BA/MS designation. No other impacts are anticipated.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

There are no programmatic changes.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

Seven students currently enrolled. The Department anticipates the change to an MS will enhance professional training and therefore allow the program to grow.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

None.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that

accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

None.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

None.

15. Please describe the budgetary impact that the proposed change will have:

None.

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

No change.

The master's in Energy & Environment provides a professional training degree for students with an undergraduate degree in the natural sciences, the social sciences, the humanities, engineering, or management. This program prepares students for professional opportunities in energy-related fields by employers in the private sector (e.g., consulting companies, electric utilities), the government sector (e.g., Energy Information Administration, public utility commissions), and nongovernmental organizations (e.g., Northeast Energy Efficiency Partnerships, Inc.).

Course Requirements
At least 32 credits (typically 8 courses) as follows:

Core Courses
CAS GE 516 Multivariate Analysis for Geographers*
CAS GE 519 Energy, Society, and the Environment
GRS GE 620 Methods of Environmental Policy Analysis

GRS GE 660 Food, Energy, and Water Policy
CAS GE 555 World Oil Markets or QST PL 852 Electricity Industry Strategy and Governance
CAS GE 712 Regional Energy Modeling or GE 550 Modeling Environmental and Social Systems

*Students with extensive backgrounds in statistics may, with permission of the Program Director, select a more specialized course.

Elective Courses
Two electives selected in consultation with the Program Director. Suggested courses can be found on the department website.

Language Requirement
There is no foreign language requirement for this degree.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

None.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

None.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

None.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

(Based on AY10-20 figures at https://www.bu.edu/finaid/aid-basics/cost-of-education/graduate/).

Tuition/Fee Item	Amount
Annual tuition	$54,720
Fees	$782

21. What is the average number of years for a full-time student to complete the program?

The program is designed to be completed in 1 year, though a quarter of our students take 3 semesters.

22. What is the maximum number of years allowed to complete the program?

2 years

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

n/a

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

n/a

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

Yes, per existing regulations.

26. Are you phasing out or replacing another program? If so, what program?

The MS in Energy and Environment will replace the MA in Energy and Environment.

Name MS Energy & Environment
Program Type
Revenue Sharing
Expected Start Date Fall 2021

Fringe Benefits Rates, Effective July 1, 2019

Professional Staff	26
Support Staff	0.247
Graduate Students	0.099
Overhead	0.26

The proposed change from MA to MS does not affect the budget.

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
Enrollment Headcount		**FTE**		**FTE**		**FTE**		**FTE**		**FTE**		
	Number of Full-Time Entering Students											
	Number of Full-Time Continuing Students											
	Number of Part-Time Students											
	TOTAL ENROLLMENT	0		0		0		0		0		
		Tution Rate	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	
Tuition Income	Full-Time Entering Students		-		-		-		-		-	
	Full-Time Continuing Students		-		-		-		-		-	
	Part-Time Students		-		-		-		-		-	
	TOTAL TUITION INCOME		-		-		-		-		-	
		Rate	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	
Fee Income	Application Fee		-		-		-		-		-	
	Student Services Fee Income		-		-		-		-		-	
	Community Service Fee Income		-		-		-		-		-	
	Health and Wellness Fee Income		-		-		-		-		-	
	Applied Music Fee		-		-		-		-		-	
	TOTAL FEE INCOME		-		-		-		-		-	
Other Income	Other Revenue											
	Sales Revenue-Good and Services											
	TOTAL OTHER INCOME		-		-		-		-		-	
	TOTAL INCOME		-		-		-		-		-	
Faculty/Staff Headcount (FTE)/ Salary Expense		**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	
	Faculty Salary-New											
	Faculty Salary-Existing											
	Administrative Staff Salary-New											
	Administrative Staff Salary-Existing											
	Support Staff Salary-New											
	Support Staff Salary-Existing											
	Graduate Student Support-New											
	Graduate Student Support-Existing											
	Student Support											
	Fellowship Stipend (service)											
	Contracted Services											

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
	TOTAL FACULTY/STAFF (FTE)/Salary Expense	-	-	-	-	-	-	-	-	-	-	
Fringe Benefits	Professional Staff Fringe Benefits		-		-		-		-		-	
	Support Staff Fringe Benefits		-		-		-		-		-	
	Graduate Student Fringe Benefits		-		-		-		-		-	
	TOTAL FRINGE BENEFITS		-		-		-		-		-	
Operating Expense	Books, periodicals (includes library impact statement)											
	Computer Software											
	Conference Fees Paid											
	Consumable Supplies-Office											
	Contracted Services- Other											
	Contracted Services-Consulting											
	Contracted Services-Equipment Maint/Rep											
	Dues & Membership											
	Equipment Rental/Lease											
	External Rent											
	F&A External											
	F&A Internal											
	FMP: CUSTODIAL											
	FMP: MAINT SVS											
	Food Expense											
	Honoraria											
	Internal Rent											
	ISR: CATERING											
	ISR: RENTAL PROPERTY MANAGEMENT											
	Licenses											
	Meeting Expense-Staff/Business Meetings											
	Moveable Capital Equipment											
	Non-Capital/Minor Equipment											
	Postage & Mail											
	Reproduction and Printing											
	Subcontracts < $25,000											
	Telecommunications Equipment											
	Telecommunications Usage											
	Travel-Domestic											
	Travel-Foreign											
	Unclassified Expense											
	TOTAL OPERATING EXPENSE		-		-		-		-		-	
Financial Aid	Graduate Aid											
	Fellowship Stipend (non-service)											
	TOTAL FINANCIAL AID		-		-		-		-		-	

		Year 1	Year 2	Year 3	Year 4	Year 5	NOTES
Equipment and Renovations > $5,000							
	Equipment Upgrades						
	Renovations						
	TOTAL EQUIPMENT AND RENOVATIONS	-	-	-	-	-	
	TOTAL EXPENSE	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)							
	PLEASE INCLUDE NAMES	**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	Faculty-Funded by Department						
	Administrative Staff-Funded by Department						
	Support Staff-Funded by Department						
	Graduate Students-Funded by Department						
	Departmental Contribution						
	IDC Return						
	Tuition Sharing						
	TOTAL SOURCES OF INTERNAL FUNDING	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Program Expenses less Existing Funding		-	-	-	-	-	
Less: Expected Sources of Other Funding (External)		**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	PLEASE INCLUDE NAMES						
	Faculty-Funded by Grants						
	Administrative Staff-Funded by Grants						
	Support Staff-Funded by Grants						
	Graduate Students-Funded by Grants						
	Departmental Contribution						
	IDC Return						
	Other (add detail)						
	Other (add detail)						
	Other (add detail)						
	TOTAL SOURCES OF OTHER FUNDING	-	-	-	-	-	
Less: Expected Sources of Other Funding (External)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Variance with Existing & Expected External Funding		-	-	-	-	-	
TOTAL TUITION INCOME		-	-	-	-	-	
TOTAL FEE INCOME		-	-	-	-	-	
TOTAL OTHER INCOME		-	-	-	-	-	
TOTAL INCOME		-	-	-	-	-	
TOTAL DIRECT COSTS		-	-	-	-	-	
TOTAL INDIRECT COSTS		-	-	-	-	-	
OVERHEAD		-	-	-	-	-	
MARGIN (excluding overhead)		-	-	-	-	-	
MARGIN (including overhead) (for informational purposes only)		-	-	-	-	-	
MARGIN % (excluding overhead)		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	
MARGIN % (including overhead) (for informational purposes only)		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	

Assumptions/Notes

5 year budget shown in constant dollars rather than assuming an inflationary increase

Narrative should also explain that any budgetary impact to a program should be submitted.

No need to include G/L codes

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: CAS Earth & Environment DATE SUBMITTED: 11/1/19

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

[Bachelor of Arts in Earth & Environmental Sciences OR Bachelor of Arts in Environmental Analysis & Policy] AND Master of Science in Energy & Environment to replace [Bachelor of Arts in Earth & Environmental Sciences OR Bachelor of Arts in Environmental Analysis & Policy] AND Master of Arts in Energy & Environment

Will this course/minor/program create a need for:

Yes / No

no	**Space/Renovations (office or classroom)?**
no	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
no	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): BA Earth& Environmental Sciences OR BA Environmental Analysis & Policy and MS Energy & Environment

Proposing/Supporting Department: CAS Earth & Environment

Proposed Start Date: Fall 2021

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Senior Lecturer James Baldwin

jbaldwin@bu.edu

617-353-7551

2. Please describe briefly the proposed change to the existing degree:

Change degree conferred from a Master's of Arts to a Master's of Science.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Conversion of this degree is intended to achieve three key objectives; to more accurately convey the nature of the degree program, to better align the degree program with market demand in the Energy and Environmental field, and to maintain competitiveness with institutions offering degree programs in the field.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

Both the department of Earth and Environment and Graduate School of Arts and Sciences have targeted growth in our professional MA programs as an immediate, as well as long term, goal. Conversion of this degree program from a MA to a MS is a more accurate reflection of the quantitative nature of the degree program but also will make the program more competitive with peer institutions while improving the marketability of degree recipients.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

There are no changes to the program requirements.

Current program	Revised program
Required: CAS GE 516 Multivariate Analysis for Geographers	Required: CAS GE 516 Multivariate Analysis for Geographers
Required: CAS GE 519 Energy, Society, and the Environment	Required: CAS GE 519 Energy, Society, and the Environment
Required: GRS GE 620 Methods of Environmental Policy Analysis	Required: GRS GE 620 Methods of Environmental Policy Analysis
Required: GRS GE 660 Food, Energy, and Water Policy	Required: GRS GE 660 Food, Energy, and Water Policy

Required: CAS GE 555 World Oil Markets or QST PL 852 Electricity Markets	Required: CAS GE 555 World Oil Markets or QST PL 852 Electricity Markets
Required: CAS GE 712 Regional Energy Modeling or GE 550 Modeling Environmental and Social Systems	Required: CAS GE 712 Regional Energy Modeling or GE 550 Modeling Environmental and Social Systems
Electives: 2 chosen in consultation with advisor	Electives: 2 chosen in consultation with advisor

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

Formal and informal feedback from current and former students reveals a desire for this change of degree designation. Both groups report that the market 'values' an MS more than an MA. As such, converting the degree to an MS makes the program more appealing to potential applicants.

7. Please list learning outcomes for the revised program:

There are no changes to the learning outcomes.

- Demonstrate a thorough understanding of (a) one or more current energy and/or environmental issues along multiple dimensions (resources, technologies, and markets), and their relationship of these dimensions to (b) fundamental concepts from economics and other social science disciplines (e.g., political science/international relations, or law), and (c) fundamental concepts from natural science
- Demonstrate knowledge of quantitative and qualitative theoretical frameworks and methodological approaches used to analyze environmental problems and understand the effectiveness of policy interventions
- Quantitatively analyze data and perform simulation modeling to characterize the impacts of energy and environmental policies on human systems
- Communicate effectively, verbally and in writing, concepts in the natural and social sciences as they relate to environmental issues, and demonstrate a thorough understanding of the broader societal consequences of one or more environmental problems and policies
- Apply analytical techniques from statistics, spatial science, and economics to solve qualitative and quantitative problems in the design and implementation of policies to address environmental issues

8. How does the change place your program in the context of programs at peer institutions?

Converting the degree to an MS will make our program more consistent with those offered by other Universities such as Berkeley, Stanford, Yale, Duke, University of Chicago, University of North Carolina, University of Oregon, among numerous others, and consequently more competitive.

9. How does the change affect other academic units and existing programs at the University?

This change is concurrent with the proposal to change our stand-alone MA to the MS.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

There are no programmatic changes.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

Six BA/MA students currently are enrolled. The Department anticipates the change to an MS will enhance professional training and therefore allow the program to grow.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

None.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be

specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

None.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

None.

15. Please describe the budgetary impact that the proposed change will have:

None.

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

No change.

The BA/MA program in Energy & Environment offered through the Department of Earth & Environment combines advanced undergraduate and graduate coursework to provide students with the foundational knowledge and advanced analytical and data management skills to prepare them for professional opportunities in energy and environmental fields at a variety of organizations including government agencies, consulting firms, and nonprofits. The program allows qualified juniors and seniors to earn a bachelor's and a master's degree in a consistent program.

The program is open to students pursing the major in either Environmental Analysis & Policy (EAP) or Earth & Environmental Sciences (EES). The MA is awarded in Energy & Environment by the Graduate School of Arts & Sciences (GRS).

Students receive the BA and MA degrees simultaneously. Pursuing a second undergraduate major is allowed only by petition to the Graduate School of Arts & Sciences upon application to

the BA/MA program. Courses taken for graduate credit must be taken at the 500 level or higher and completed with a grade of B− or above.

Requirements

Students in the Energy & Environment BA/MA program are required to complete a total of 38 courses (152 credits) while fulfilling all requirements for both the CAS BA and the GRS MA programs. Specific paths of completion will be determined by a student's undergraduate program.

Environmental Analysis & Policy Majors

Environmental Analysis & Policy majors can count two courses toward both the BA and the MA requirements:

1. GRS GE 620 Methods of Environmental Policy Analysis (which fulfills the CAS GE 420 requirement for the BA in EAP major)
2. One additional 4-credit course from the approved list of coursework for the MA in Energy & Environment program. A course at the 400/600 level that fulfills both BA and MA requirements may count toward both programs, but it must be taken at the 600 level.

A complete list of requirements for the BA in Environmental Analysis & Policy can be found by visiting the BA in Environmental Analysis & Policy section of this Bulletin.

A complete list of requirements for the MA in Energy & Environment can be found by visiting the MA in Energy & Environment section of the GRS Bulletin.

Earth & Environmental Sciences Majors

Earth & Environmental Sciences majors can count two courses toward both the BA and the MA requirements:

1. CAS GE 516 Multivariate Analysis for Geographers, which fulfills an upper-elective principal group requirement for students focusing on Earth Observations and a breadth requirement for students focusing on Ecosystems or Earth & Climate.
2. One additional 4-credit course from the approved list of coursework for the MA in Energy & Environment program. A course at the 400/600 level that fulfills both BA and MA requirements may count toward both programs, but it must be taken at the 600 level. (**Note:** Students may, in consultation with their advisor, select courses beyond the approved list of elective courses in the MA in Energy & Environment program to count toward the MA.)

A complete list of requirements for the BA in Earth & Environmental Sciences can be found by visiting the BA in Earth & Environmental Sciences section of this Bulletin.

A complete list of requirements for the MA in Energy & Environment can be found by visiting the MA in Energy & Environment section of the GRS Bulletin.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

None.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

None.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

None.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

Covered by undergraduate tuition.

21. What is the average number of years for a full-time student to complete the program?

Most students complete the BA and MA programs concurrently within 4 years; occasionally students take 1 additional semester.

22. What is the maximum number of years allowed to complete the program?

6 years

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

n/a

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

n/a

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

Yes, per existing regulations.

26. Are you phasing out or replacing another program? If so, what program?

The MS in Energy and Environment will replace the MA in Energy and Environment.

Name BA/MS Energy & Environment
Program Type
Revenue Sharing
Expected Start Date Fall 2021

Fringe Benefits Rates, Effective July 1, 2019

Professional Staff	26
Support Staff	0.247
Graduate Students	0.099
Overhead	0.26

The proposed change from MA to MS does not affect the budget.

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
Enrollment Headcount		**FTE**		**FTE**		**FTE**		**FTE**		**FTE**		
	Number of Full-Time Entering Students											
	Number of Full-Time Continuing Students											
	Number of Part-Time Students											
	TOTAL ENROLLMENT	0		0		0		0		0		
		Tution Rate	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	
Tuition Income	Full-Time Entering Students		-		-		-		-		-	
	Full-Time Continuing Students		-		-		-		-		-	
	Part-Time Students		-		-		-		-		-	
	TOTAL TUITION INCOME		-		-		-		-		-	
		Rate	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	
Fee Income	Application Fee		-		-		-		-		-	
	Student Services Fee Income		-		-		-		-		-	
	Community Service Fee Income		-		-		-		-		-	
	Health and Wellness Fee Income		-		-		-		-		-	
	Applied Music Fee		-		-		-		-		-	
	TOTAL FEE INCOME		-		-		-		-		-	
Other Income	Other Revenue											
	Sales Revenue-Good and Services											
	TOTAL OTHER INCOME		-		-		-		-		-	
	TOTAL INCOME		-		-		-		-		-	
Faculty/Staff Headcount (FTE)/ Salary Expense		**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	
	Faculty Salary-New											
	Faculty Salary-Existing											
	Administrative Staff Salary-New											
	Administrative Staff Salary-Existing											
	Support Staff Salary-New											
	Support Staff Salary-Existing											
	Graduate Student Support-New											
	Graduate Student Support-Existing											
	Student Support											
	Fellowship Stipend (service)											
	Contracted Services											

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
	TOTAL FACULTY/STAFF (FTE)/Salary Expense	-	-	-	-	-	-	-	-	-	-	
Fringe Benefits	Professional Staff Fringe Benefits		-		-		-		-		-	
	Support Staff Fringe Benefits		-		-		-		-		-	
	Graduate Student Fringe Benefits		-		-		-		-		-	
	TOTAL FRINGE BENEFITS		-		-		-		-		-	
Operating Expense	Books, periodicals (includes library impact statement)											
	Computer Software											
	Conference Fees Paid											
	Consumable Supplies-Office											
	Contracted Services- Other											
	Contracted Services-Consulting											
	Contracted Services-Equipment Maint/Rep											
	Dues & Membership											
	Equipment Rental/Lease											
	External Rent											
	F&A External											
	F&A Internal											
	FMP: CUSTODIAL											
	FMP: MAINT SVS											
	Food Expense											
	Honoraria											
	Internal Rent											
	ISR: CATERING											
	ISR: RENTAL PROPERTY MANAGEMENT											
	Licenses											
	Meeting Expense-Staff/Business Meetings											
	Moveable Capital Equipment											
	Non-Capital/Minor Equipment											
	Postage & Mail											
	Reproduction and Printing											
	Subcontracts < $25,000											
	Telecommunications Equipment											
	Telecommunications Usage											
	Travel-Domestic											
	Travel-Foreign											
	Unclassified Expense											
	TOTAL OPERATING EXPENSE		-		-		-		-		-	
Financial Aid	Graduate Aid											
	Fellowship Stipend (non-service)											
	TOTAL FINANCIAL AID		-		-		-		-		-	

		Year 1	Year 2	Year 3	Year 4	Year 5	NOTES
Equipment and Renovations > $5,000							
	Equipment Upgrades						
	Renovations						
	TOTAL EQUIPMENT AND RENOVATIONS	-	-	-	-	-	
	TOTAL EXPENSE	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)							
	PLEASE INCLUDE NAMES	**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	Faculty-Funded by Department						
	Administrative Staff-Funded by Department						
	Support Staff-Funded by Department						
	Graduate Students-Funded by Department						
	Departmental Contribution						
	IDC Return						
	Tuition Sharing						
	TOTAL SOURCES OF INTERNAL FUNDING	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Program Expenses less Existing Funding		-	-	-	-	-	
Less: Expected Sources of Other Funding (External)		**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	PLEASE INCLUDE NAMES						
	Faculty-Funded by Grants						
	Administrative Staff-Funded by Grants						
	Support Staff-Funded by Grants						
	Graduate Students-Funded by Grants						
	Departmental Contribution						
	IDC Return						
	Other (add detail)						
	Other (add detail)						
	Other (add detail)						
	TOTAL SOURCES OF OTHER FUNDING	-	-	-	-	-	
Less: Expected Sources of Other Funding (External)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Variance with Existing & Expected External Funding		-	-	-	-	-	
TOTAL TUITION INCOME		-	-	-	-	-	
TOTAL FEE INCOME		-	-	-	-	-	
TOTAL OTHER INCOME		-	-	-	-	-	
TOTAL INCOME		-	-	-	-	-	
TOTAL DIRECT COSTS		-	-	-	-	-	
TOTAL INDIRECT COSTS		-	-	-	-	-	
OVERHEAD		-	-	-	-	-	
MARGIN (excluding overhead)		-	-	-	-	-	
MARGIN (including overhead) (for informational purposes only)		-	-	-	-	-	
MARGIN % (excluding overhead)		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	
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Assumptions/Notes

5 year budget shown in constant dollars rather than assuming an inflationary increase

Narrative should also explain that any budgetary impact to a program should be submitted.

No need to include G/L codes

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: CAS Earth & Environment DATE SUBMITTED: 11/1/19

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

Master of Science in Remote Sensing & Geospatial Sciences to replace the Master of Arts in Remote Sensing & Geospatial Sciences

Will this course/minor/program create a need for:

Yes / No

no	**Space/Renovations (office or classroom)?**
no	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
no	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): MS in Remote Sensing & Geospatial Sciences

Proposing/Supporting Department: CAS Earth & Environment

Proposed Start Date: Fall 2021

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Professor Curtis Woodcock

curtis@bu.edu

617-353-5746

2. Please describe briefly the proposed change to the existing degree:

Change degree conferred from a Master's of Arts to a Master's of Science.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Conversion of this degree is intended to achieve three key objectives; to more accurately convey the nature of the degree program, to better align the degree program with market demand in the remote sensing and geographic information systems field, and to maintain competitiveness with institutions offering degree programs in the field.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

Both the Department of Earth and Environment and Graduate School of Arts and Sciences have targeted growth in our professional MA programs as an immediate, as well as long term, goal. Conversion of this degree program from a MA to a MS is a more accurate reflection of the quantitative nature of the degree program but also will make the program more competitive with peer institutions while improving the marketability of degree recipients.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

There are no changes to the program requirements.

Current program	Revised program
Required: CAS GE 501 Advanced Topics in Remote Sensing	Required: CAS GE 501 Advanced Topics in Remote Sensing
Required: GE 505 Geographic Information Systems (GIS)	Required: GE 505 Geographic Information Systems (GIS)
Required: GE 509 Applied Environmental Statistics or GE 516 Multivariate Analysis for Geographers	Required: GE 509 Applied Environmental Statistics or GE 516 Multivariate Analysis for Geographers
Electives: 5 chosen from: • GE 503 Micrometeorology: Energy & Mass Transfer at the Earth's Surface • GE 504 Physical Climatology	Electives: 5 chosen from: • GE 503 Micrometeorology: Energy & Mass Transfer at the Earth's Surface • GE 504 Physical Climatology

• GE 509 Applied Environmental Statistics • GE 516 Multivariate Analysis for Geographers • GE 529 Modeling & Monitoring Terrestrial Ecosystem Processes • GE 585 Ecological Forecasting & Informatics • ES 620 Aquatic Optics & Remote Sensing • GE 640 Digital Image Processing in Remote Sensing • GE 645 Physical Models of Remote Sensing • GE 648 Remote Sensing of Vegetation • GE 805 Spatial Data Analysis Using GIS • GE 840 Advanced Topics in Remote Sensing • GE 845 Advanced Topics in Geographic Information Systems • CS 521 Information Structures with Python	• GE 509 Applied Environmental Statistics • GE 516 Multivariate Analysis for Geographers • GE 529 Modeling & Monitoring Terrestrial Ecosystem Processes • GE 585 Ecological Forecasting & Informatics • ES 620 Aquatic Optics & Remote Sensing • GE 640 Digital Image Processing in Remote Sensing • GE 645 Physical Models of Remote Sensing • GE 648 Remote Sensing of Vegetation • GE 805 Spatial Data Analysis Using GIS • GE 840 Advanced Topics in Remote Sensing • GE 845 Advanced Topics in Geographic Information Systems CS 521 Information Structures with Python

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

Formal and informal feedback from current and former students reveals a desire for this change of degree designation. Both groups report that the market 'values' an MS more than an MA. As such, converting the degree to an MS makes the program more appealing to potential applicants.

7. Please list learning outcomes for the revised program:

- Demonstrate advanced knowledge of theory of remote sensing and GIS including sensor systems, basic radiative transfer, cartographic projections and display, and spatial databases, and of fundamental concepts in geospatial analysis and modeling techniques.

- Quantitatively analyze data to evaluate scientific hypotheses and arguments in remote sensing and geographic information science.
- Communicate effectively, both verbally and in writing, advanced concepts in remote sensing and geographic information systems.
- Demonstrate understanding of the broader impacts and applications of remote sensing and GIS for natural sciences, social sciences, and for society at large.
- Apply a range of geospatial analysis techniques using remote sensing and GIS tools toward solving quantitative problems in one or more core disciplinary areas such as geography, ecology, environmental sciences, biogeosciences, urban planning or natural resources management.

8. How does the change place your program in the context of programs at peer institutions?

Converting the degree to an MS will make our program more consistent with those offered by other universities such as the University of California – Santa Barbara, Clark University, Johns Hopkins University, Arizona State University, University of Pittsburgh, University of Maryland, and University of Connecticut, among numerous others, and consequently more competitive.

9. How does the change affect other academic units and existing programs at the University?

This change will impact the BA/MA degree offered through the department of Earth and Environment which will need to change to a BA/MS designation. No other impacts are anticipated.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

There are no programmatic changes.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

Seven students currently enrolled. The Department anticipates the change to an MS will enhance professional training and therefore allow the program to grow.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

None.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

None.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

None.

15. Please describe the budgetary impact that the proposed change will have:

None.

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

No change.

The master's in Remote Sensing & Geospatial Sciences (RS & GS) is designed for students with diverse natural science and social science backgrounds who desire specialized training in the use of remote sensing and geographic information systems (GIS) in environmental and natural resource analysis and management. The curriculum is designed to train students in both the underlying theory and application of remote sensing (e.g., image processing), spatial analytical methods (e.g., spatial statistics), and digital cartography and geographic information systems. Students are trained for careers in the private, public, and nonprofit sectors where there is high demand for professionals with advanced technical skills who can organize and analyze spatial data sets. Applicants to the RS & GS program are expected to have basic competency in calculus and statistics. Candidates who do not have the required quantitative skills may be admitted, but they will be required to do independent work or additional coursework to acquire the necessary background. Students should consult the Program Director to ascertain if they have the required background.

Course Requirements
At least 32 credits (typically 8 courses) must be completed as follows:

Core Courses
CAS GE 501 Advanced Topics in Remote Sensing
CAS GE 505 Geographic Information Systems (GIS)
CAS GE 509 Applied Environmental Statistics or CAS GE 516 Multivariate Analysis for Geographers*

Electives
Five electives selected in consultation with advisor. Suggested courses can be found on the department website.**

*Course taken to fulfill statistical methods requirement cannot be double counted as an elective.
**With the prior approval of an advisor, students in the program may select graduate-level (500 and higher) courses beyond the approved list of electives to fulfill the electives requirement.

Language Requirement
There is no foreign language requirement for this degree.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

None.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

None.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

None.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

(Based on AY10-20 figures at https://www.bu.edu/finaid/aid-basics/cost-of-education/graduate/).

Tuition/Fee Item	Amount
Annual tuition	$54,720
Fees	$782

21. What is the average number of years for a full-time student to complete the program?

The program is designed to be completed in 1 year, though a quarter of our students take 3 semesters.

22. What is the maximum number of years allowed to complete the program?

2 years

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

n/a

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

n/a

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

Yes, per existing regulations.

26. Are you phasing out or replacing another program? If so, what program?

The MS in Energy and Environment will replace the MA in Energy and Environment.

Name	MS Remote Sensing & Geospatial Sciences
Program Type	
Revenue Sharing	
Expected Start Date	Fall 2021

Fringe Benefits Rates, Effective July 1, 2019

Professional Staff	26
Support Staff	0.247
Graduate Students	0.099
Overhead	0.26

The proposed change from MA to MS does not affect the budget.

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
Enrollment Headcount		**FTE**		**FTE**		**FTE**		**FTE**		**FTE**		
	Number of Full-Time Entering Students											
	Number of Full-Time Continuing Students											
	Number of Part-Time Students											
	TOTAL ENROLLMENT	0		0		0		0		0		
		Tution Rate	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	
Tuition Income	Full-Time Entering Students		-		-		-		-		-	
	Full-Time Continuing Students		-		-		-		-		-	
	Part-Time Students		-		-		-		-		-	
	TOTAL TUITION INCOME		-		-		-		-		-	
		Rate	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	
Fee Income	Application Fee		-		-		-		-		-	
	Student Services Fee Income		-		-		-		-		-	
	Community Service Fee Income		-		-		-		-		-	
	Health and Wellness Fee Income		-		-		-		-		-	
	Applied Music Fee		-		-		-		-		-	
	TOTAL FEE INCOME		-		-		-		-		-	
Other Income	Other Revenue											
	Sales Revenue-Good and Services											
	TOTAL OTHER INCOME		-		-		-		-		-	
	TOTAL INCOME		-		-		-		-		-	
Faculty/Staff Headcount (FTE)/ Salary Expense		**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	
	Faculty Salary-New											
	Faculty Salary-Existing											
	Administrative Staff Salary-New											
	Administrative Staff Salary-Existing											
	Support Staff Salary-New											
	Support Staff Salary-Existing											
	Graduate Student Support-New											
	Graduate Student Support-Existing											
	Student Support											
	Fellowship Stipend (service)											
	Contracted Services											

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
	TOTAL FACULTY/STAFF (FTE)/Salary Expense	-	-	-	-	-	-	-	-	-	-	
Fringe Benefits	Professional Staff Fringe Benefits		-		-		-		-		-	
	Support Staff Fringe Benefits		-		-		-		-		-	
	Graduate Student Fringe Benefits		-		-		-		-		-	
	TOTAL FRINGE BENEFITS		-		-		-		-		-	
Operating Expense	Books, periodicals (includes library impact statement)											
	Computer Software											
	Conference Fees Paid											
	Consumable Supplies-Office											
	Contracted Services- Other											
	Contracted Services-Consulting											
	Contracted Services-Equipment Maint/Rep											
	Dues & Membership											
	Equipment Rental/Lease											
	External Rent											
	F&A External											
	F&A Internal											
	FMP: CUSTODIAL											
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	Subcontracts < $25,000											
	Telecommunications Equipment											
	Telecommunications Usage											
	Travel-Domestic											
	Travel-Foreign											
	Unclassified Expense											
	TOTAL OPERATING EXPENSE		-		-		-		-		-	
Financial Aid	Graduate Aid											
	Fellowship Stipend (non-service)											
	TOTAL FINANCIAL AID		-		-		-		-		-	

		Year 1	Year 2	Year 3	Year 4	Year 5	NOTES
Equipment and Renovations > $5,000							
	Equipment Upgrades						
	Renovations						
	TOTAL EQUIPMENT AND RENOVATIONS	-	-	-	-	-	
	TOTAL EXPENSE	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)							
	PLEASE INCLUDE NAMES	**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	Faculty-Funded by Department						
	Administrative Staff-Funded by Department						
	Support Staff-Funded by Department						
	Graduate Students-Funded by Department						
	Departmental Contribution						
	IDC Return						
	Tuition Sharing						
	TOTAL SOURCES OF INTERNAL FUNDING	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Program Expenses less Existing Funding		-	-	-	-	-	
Less: Expected Sources of Other Funding (External)		**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	PLEASE INCLUDE NAMES						
	Faculty-Funded by Grants						
	Administrative Staff-Funded by Grants						
	Support Staff-Funded by Grants						
	Graduate Students-Funded by Grants						
	Departmental Contribution						
	IDC Return						
	Other (add detail)						
	Other (add detail)						
	Other (add detail)						
	TOTAL SOURCES OF OTHER FUNDING	-	-	-	-	-	
Less: Expected Sources of Other Funding (External)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Variance with Existing & Expected External Funding		-	-	-	-	-	
TOTAL TUITION INCOME		-	-	-	-	-	
TOTAL FEE INCOME		-	-	-	-	-	
TOTAL OTHER INCOME		-	-	-	-	-	
TOTAL INCOME		-	-	-	-	-	
TOTAL DIRECT COSTS		-	-	-	-	-	
TOTAL INDIRECT COSTS		-	-	-	-	-	
OVERHEAD		-	-	-	-	-	
MARGIN (excluding overhead)		-	-	-	-	-	
MARGIN (including overhead) (for informational purposes only)		-	-	-	-	-	
MARGIN % (excluding overhead)		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	
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Assumptions/Notes

5 year budget shown in constant dollars rather than assuming an inflationary increase

Narrative should also explain that any budgetary impact to a program should be submitted.

No need to include G/L codes

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: CAS Earth & Environment DATE SUBMITTED: 11/1/19

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

[Bachelor of Arts in Earth & Environmental Sciences OR Bachelor of Arts in Environmental Analysis & Policy] AND Master of Science in Remote Sensing & Geospatial Science to replace [Bachelor of Arts in Earth & Environmental Sciences OR Bachelor of Arts in Environmental Analysis & Policy] AND Master of Arts in Remote Sensing & Geospatial Science

Will this course/minor/program create a need for:

Yes / No

no	**Space/Renovations (office or classroom)?**
no	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
no	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): BA in Earth & Envirnomental Science OR BA in Environmental Analysis &Policy and MS in Remote Sensing & Geospatial Sciences

Proposing/Supporting Department: CAS Earth & Environment

Proposed Start Date: Fall 2021

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Professor Curtis Woodcock

curtis@bu.edu

617-353-5746

2. Please describe briefly the proposed change to the existing degree:

Change degree conferred from a Master's of Arts to a Master's of Science.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Conversion of this degree is intended to achieve three key objectives; to more accurately convey the nature of the degree program, to better align the degree program with market demand in the remote sensing and geographic information systems field, and to maintain competitiveness with institutions offering degree programs in the field.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

Both the Department of Earth and Environment and Graduate School of Arts and Sciences have targeted growth in our professional MA programs as an immediate, as well as long term, goal. Conversion of this degree program from a MA to a MS is a more accurate reflection of the quantitative nature of the degree program but also will make the program more competitive with peer institutions while improving the marketability of degree recipients.

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

There are no changes to the program requirements.

Current program	Revised program
Required: CAS GE 501 Advanced Topics in Remote Sensing	Required: CAS GE 501 Advanced Topics in Remote Sensing
Required: GE 505 Geographic Information Systems (GIS)	Required: GE 505 Geographic Information Systems (GIS)
Required: GE 509 Applied Environmental Statistics or GE 516 Multivariate Analysis for Geographers	Required: GE 509 Applied Environmental Statistics or GE 516 Multivariate Analysis for Geographers
Electives: 5 chosen from:	Electives: 5 chosen from:

• GE 503 Micrometeorology: Energy & Mass Transfer at the Earth's Surface • GE 504 Physical Climatology • GE 509 Applied Environmental Statistics • GE 516 Multivariate Analysis for Geographers • GE 529 Modeling & Monitoring Terrestrial Ecosystem Processes • GE 585 Ecological Forecasting & Informatics • ES 620 Aquatic Optics & Remote Sensing • GE 640 Digital Image Processing in Remote Sensing • GE 645 Physical Models of Remote Sensing • GE 648 Remote Sensing of Vegetation • GE 805 Spatial Data Analysis Using GIS • GE 840 Advanced Topics in Remote Sensing • GE 845 Advanced Topics in Geographic Information Systems • CS 521 Information Structures with Python	• GE 503 Micrometeorology: Energy & Mass Transfer at the Earth's Surface • GE 504 Physical Climatology • GE 509 Applied Environmental Statistics • GE 516 Multivariate Analysis for Geographers • GE 529 Modeling & Monitoring Terrestrial Ecosystem Processes • GE 585 Ecological Forecasting & Informatics • ES 620 Aquatic Optics & Remote Sensing • GE 640 Digital Image Processing in Remote Sensing • GE 645 Physical Models of Remote Sensing • GE 648 Remote Sensing of Vegetation • GE 805 Spatial Data Analysis Using GIS • GE 840 Advanced Topics in Remote Sensing • GE 845 Advanced Topics in Geographic Information Systems CS 521 Information Structures with Python

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

Formal and informal feedback from current and former students reveals a desire for this change of degree designation. Both groups report that the market 'values' an MS more than an MA. As such, converting the degree to an MS makes the program more appealing to potential applicants.

7. Please list learning outcomes for the revised program:

- Demonstrate advanced knowledge of theory of remote sensing and GIS including sensor systems, basic radiative transfer, cartographic projections and display, and spatial databases, and of fundamental concepts in geospatial analysis and modeling techniques.

- Quantitatively analyze data to evaluate scientific hypotheses and arguments in remote sensing and geographic information science.
- Communicate effectively, both verbally and in writing, advanced concepts in remote sensing and geographic information systems.
- Demonstrate understanding of the broader impacts and applications of remote sensing and GIS for natural sciences, social sciences, and for society at large.
- Apply a range of geospatial analysis techniques using remote sensing and GIS tools toward solving quantitative problems in one or more core disciplinary areas such as geography, ecology, environmental sciences, biogeosciences, urban planning or natural resources management.

8. How does the change place your program in the context of programs at peer institutions?

Converting the degree to an MS will make our program more consistent with those offered by other universities such as the University of California – Santa Barbara, Clark University, Johns Hopkins University, Arizona State University, University of Pittsburgh, University of Maryland, and University of Connecticut, among numerous others, and consequently more competitive.

9. How does the change affect other academic units and existing programs at the University?

This change will impact the BA/MA degree offered through the department of Earth and Environment which will need to change to a BA/MS designation. No other impacts are anticipated.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

There are no programmatic changes.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the

numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

Seven students currently enrolled. The Department anticipates the change to an MS will enhance professional training and therefore allow the program to grow.

12. Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

None.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

None.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

None.

15. Please describe the budgetary impact that the proposed change will have:

None.

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes) [NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

No change.

The master's in Remote Sensing & Geospatial Sciences (RS & GS) is designed for students with diverse natural science and social science backgrounds who desire specialized training in the use of remote sensing and geographic information systems (GIS) in environmental and natural resource analysis and management. The curriculum is designed to train students in both the underlying theory and application of remote sensing (e.g., image processing), spatial analytical methods (e.g., spatial statistics), and digital cartography and geographic information systems. Students are trained for careers in the private, public, and nonprofit sectors where there is high demand for professionals with advanced technical skills who can organize and analyze spatial data sets. Applicants to the RS & GS program are expected to have basic competency in calculus and statistics. Candidates who do not have the required quantitative skills may be admitted, but they will be required to do independent work or additional coursework to acquire the necessary background. Students should consult the Program Director to ascertain if they have the required background.

Course Requirements
At least 32 credits (typically 8 courses) must be completed as follows:

Core Courses
CAS GE 501 Advanced Topics in Remote Sensing
CAS GE 505 Geographic Information Systems (GIS)
CAS GE 509 Applied Environmental Statistics or CAS GE 516 Multivariate Analysis for Geographers*

Electives
Five electives selected in consultation with advisor. Suggested courses can be found on the department website.**

*Course taken to fulfill statistical methods requirement cannot be double counted as an elective.
**With the prior approval of an advisor, students in the program may select graduate-level (500 and higher) courses beyond the approved list of electives to fulfill the electives requirement.

Language Requirement
There is no foreign language requirement for this degree.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

None.

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

None.

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

None.

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

(Based on AY10-20 figures at https://www.bu.edu/finaid/aid-basics/cost-of-education/graduate/).

Tuition/Fee Item	Amount
Annual tuition	$54,720
Fees	$782

21. What is the average number of years for a full-time student to complete the program?

The program is designed to be completed in 1 year, though a quarter of our students take 3 semesters.

22. What is the maximum number of years allowed to complete the program?

2 years

23. If a credit-bearing certificate, should the students be eligible for Title IV funds?

n/a

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):**

n/a

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions):

Yes, per existing regulations.

26. Are you phasing out or replacing another program? If so, what program?

The MS in Energy and Environment will replace the MA in Energy and Environment.

Name	MS Remote Sensing & Geospatial Sciences
Program Type	
Revenue Sharing	
Expected Start Date	Fall 2021

Fringe Benefits Rates, Effective July 1, 2019

Professional Staff	26
Support Staff	0.247
Graduate Students	0.099
Overhead	0.26

The proposed change from MA to MS does not affect the budget.

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
Enrollment Headcount		**FTE**		**FTE**		**FTE**		**FTE**		**FTE**		
	Number of Full-Time Entering Students											
	Number of Full-Time Continuing Students											
	Number of Part-Time Students											
	TOTAL ENROLLMENT	0		0		0		0		0		
		Tution Rate	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	**Tution Rate**	**Tuition Income**	
Tuition Income	Full-Time Entering Students		-		-		-		-		-	
	Full-Time Continuing Students		-		-		-		-		-	
	Part-Time Students		-		-		-		-		-	
	TOTAL TUITION INCOME		-		-		-		-		-	
		Rate	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	**Fee**	**Income**	
Fee Income	Application Fee		-		-		-		-		-	
	Student Services Fee Income		-		-		-		-		-	
	Community Service Fee Income		-		-		-		-		-	
	Health and Wellness Fee Income		-		-		-		-		-	
	Applied Music Fee		-		-		-		-		-	
	TOTAL FEE INCOME		-		-		-		-		-	
Other Income	Other Revenue											
	Sales Revenue-Good and Services											
	TOTAL OTHER INCOME		-		-		-		-		-	
	TOTAL INCOME		-		-		-		-		-	
Faculty/Staff Headcount (FTE)/ Salary Expense		**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	**FTE**	**Salary**	
	Faculty Salary-New											
	Faculty Salary-Existing											
	Administrative Staff Salary-New											
	Administrative Staff Salary-Existing											
	Support Staff Salary-New											
	Support Staff Salary-Existing											
	Graduate Student Support-New											
	Graduate Student Support-Existing											
	Student Support											
	Fellowship Stipend (service)											
	Contracted Services											

		Year 1		Year 2		Year 3		Year 4		Year 5		NOTES
	TOTAL FACULTY/STAFF (FTE)/Salary Expense	-	-	-	-	-	-	-	-	-	-	
Fringe Benefits	Professional Staff Fringe Benefits		-		-		-		-		-	
	Support Staff Fringe Benefits		-		-		-		-		-	
	Graduate Student Fringe Benefits		-		-		-		-		-	
	TOTAL FRINGE BENEFITS		-		-		-		-		-	
Operating Expense	Books, periodicals (includes library impact statement)											
	Computer Software											
	Conference Fees Paid											
	Consumable Supplies-Office											
	Contracted Services- Other											
	Contracted Services-Consulting											
	Contracted Services-Equipment Maint/Rep											
	Dues & Membership											
	Equipment Rental/Lease											
	External Rent											
	F&A External											
	F&A Internal											
	FMP: CUSTODIAL											
	FMP: MAINT SVS											
	Food Expense											
	Honoraria											
	Internal Rent											
	ISR: CATERING											
	ISR: RENTAL PROPERTY MANAGEMENT											
	Licenses											
	Meeting Expense-Staff/Business Meetings											
	Moveable Capital Equipment											
	Non-Capital/Minor Equipment											
	Postage & Mail											
	Reproduction and Printing											
	Subcontracts < $25,000											
	Telecommunications Equipment											
	Telecommunications Usage											
	Travel-Domestic											
	Travel-Foreign											
	Unclassified Expense											
	TOTAL OPERATING EXPENSE		-		-		-		-		-	
Financial Aid	Graduate Aid											
	Fellowship Stipend (non-service)											
	TOTAL FINANCIAL AID		-		-		-		-		-	

		Year 1	Year 2	Year 3	Year 4	Year 5	NOTES
Equipment and Renovations > $5,000							
	Equipment Upgrades						
	Renovations						
	TOTAL EQUIPMENT AND RENOVATIONS	-	-	-	-	-	
	TOTAL EXPENSE	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)							
	PLEASE INCLUDE NAMES	**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	Faculty-Funded by Department						
	Administrative Staff-Funded by Department						
	Support Staff-Funded by Department						
	Graduate Students-Funded by Department						
	Departmental Contribution						
	IDC Return						
	Tuition Sharing						
	TOTAL SOURCES OF INTERNAL FUNDING	-	-	-	-	-	
Less: Sources of Existing Funding (Internal)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Program Expenses less Existing Funding		-	-	-	-	-	
Less: Expected Sources of Other Funding (External)		**FTE**	**FTE**	**FTE**	**FTE**	**FTE**	
	PLEASE INCLUDE NAMES						
	Faculty-Funded by Grants						
	Administrative Staff-Funded by Grants						
	Support Staff-Funded by Grants						
	Graduate Students-Funded by Grants						
	Departmental Contribution						
	IDC Return						
	Other (add detail)						
	Other (add detail)						
	Other (add detail)						
	TOTAL SOURCES OF OTHER FUNDING	-	-	-	-	-	
Less: Expected Sources of Other Funding (External)-Fringe Benefits							
	Faculty Fringe Benefits	$ -	$ -	$ -	$ -	$ -	
	Administrative Staff Fringe Benefits	-	-	-	-	-	
	Support Staff Fringe Benefits	-	-	-	-	-	
	Graduate Student Fringe Benefits	-	-	-	-	-	
	TOTAL FRINGE BENEFITS	-	-	-	-	-	
Variance with Existing & Expected External Funding		-	-	-	-	-	
TOTAL TUITION INCOME		-	-	-	-	-	
TOTAL FEE INCOME		-	-	-	-	-	
TOTAL OTHER INCOME		-	-	-	-	-	
TOTAL INCOME		-	-	-	-	-	
TOTAL DIRECT COSTS		-	-	-	-	-	
TOTAL INDIRECT COSTS		-	-	-	-	-	
OVERHEAD		-	-	-	-	-	
MARGIN (excluding overhead)		-	-	-	-	-	
MARGIN (including overhead) (for informational purposes only)		-	-	-	-	-	
MARGIN % (excluding overhead)		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	
MARGIN % (including overhead) (for informational purposes only)		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	

Assumptions/Notes

5 year budget shown in constant dollars rather than assuming an inflationary increase

Narrative should also explain that any budgetary impact to a program should be submitted.

No need to include G/L codes

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): Ph.D. in Political Science

Proposing/Supporting Department: Political Science

Proposed Start Date: Fall 2020

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Taylor Boas, Director of Graduate Studies, tboas@bu.edu, 617-353-4214

2. Please describe briefly the proposed change to the existing degree:

Our current methodology requirement is to take three specific research methods courses:

GRS PO 840 Political Analysis
GRS PO 841 Quantitative Research Methods
GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation

In a pair of new course proposals submitted concurrently with the present proposal, we plan to replace PO 840: Political Analysis with two new courses: PO 842: Qualitative Approaches to the Study of Political Science and PO 844: Methods for Causal Inference.

In keeping with this change in course offerings, we propose that the new methodology requirement be that students take **any three** graduate-level methods courses in political science. As of Fall 2020, the options for fulfilling this requirement will be:

PO 841: Quantitative Research Methods
PO 842: Qualitative Approaches to the Study of Political Science
PO 843: Techniques in Political Analysis: Maximum Likelihood Estimation
PO 844: Methods for Causal Inference

In the future, any new graduate-level methods courses in PO can also be used to fulfill this requirement.

This change was approved by a unanimous vote of the Graduate Faculty of Political Science (regular faculty plus Joint Programmatic Appointments) on September 25, 2019.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Our graduate students are increasingly diverse in their methodological orientations. A large number of students are interested in learning advanced quantitative methods and using these methods in their dissertation research. Yet many other students take a primarily qualitative approach, involving archival research, elite interviews, participant observation, and interpretation of texts. Introducing an element of choice into the methodology requirement allows students to specialize in the methods most appropriate for their research, while also ensuring a broad grounding in the diverse approaches used in the discipline.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

The changes are consistent with the learning outcomes in the Department of Political Science:

1. Produce and defend an original and significant contribution to knowledge in the discipline of Political Science

2. Demonstrate mastery of subject material by developing a minimum level of competence in five of the six fields of Political Science (American Politics, Public Policy, Comparative Politics,

International Relations, Political Theory, and Methodology) and a high level of competence in two of these fields

3. Participate in professional academic community activities, such as attending local seminar series, presenting papers at conferences, and submitting papers to academic journals

4. Be able to teach the discipline at the undergraduate level

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

Current program	**Revised program**
Each of the following 3 courses:	3 out of the following 4 courses:
GRS PO 840 Political Analysis (4 credits)	GRS PO 841 Quantitative Research Methods (4 credits)
GRS PO 841 Quantitative Research Methods (4 credits)	**GRS PO 842 Qualitative Approaches to the Study of Political Science (4 credits)**
GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation (4 credits)	GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation (4 credits)
	GRS PO 844 Methods for Causal Inference (4 credits)
UNCHANGED REQUIREMENTS BELOW:	UNCHANGED REQUIREMENTS BELOW:
GRS PO 711 Approaches to the Study of American Politics (4 credits)	GRS PO 711 Approaches to the Study of American Politics (4 credits)
GRS PO 751 Approaches to the Study of Comparative Politics (4 credits)	GRS PO 751 Approaches to the Study of Comparative Politics (4 credits)
GRS PO 771 Approaches to the Study of International Relations (4 credits)	GRS PO 771 Approaches to the Study of International Relations (4 credits)
GRS PO 791 Approaches to the Study of Political Theory (4 credits)	GRS PO 791 Approaches to the Study of Political Theory (4 credits)
Two semesters of GRS PO 903/904 Research Workshop (4 credits total)	Two semesters of GRS PO 903/904 Research Workshop (4 credits total)
GRS PO 702 Professional Development (2 credits)	GRS PO 702 Professional Development (2 credits)
30 additional elective credits	30 additional elective credits
Qualifying examination and dissertation	Qualifying examination and dissertation

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

Our assessments of the program in recent years have found that, while many students are taking advantage of new opportunities to pursue advanced training in quantitative methods and use these approaches in their research, those who focus primarily on qualitative methods are lacking in opportunities for methodological training. Some second-year papers and seminar papers evaluated in recent years have shown that students lack familiarity with such topics as comparative case study research designs. Introducing a new qualitative methods course and revising the methodology requirements to allow this course to count toward the three required courses ought to rectify this shortcoming.

7. Please list learning outcomes for the revised program:

There is no change to the learning outcomes:

1. Produce and defend an original and significant contribution to knowledge in the discipline of Political Science

2. Demonstrate mastery of subject material by developing a minimum level of competence in five of the six fields of Political Science (American Politics, Public Policy, Comparative Politics, International Relations, Political Theory, and Methodology) and a high level of competence in two of these fields

3. Participate in professional academic community activities, such as attending local seminar series, presenting papers at conferences, and submitting papers to academic journals

4. Be able to teach the discipline at the undergraduate level

8. How does the change place your program in the context of programs at peer institutions?

A recent review of the top 20 Ph.D. programs in political science conducted by our department found that most offer students some degree of flexibility in methods training: either they have no required methods courses, or they offer a choice of courses that can count toward the requirement. These data are presented below.

Methods Requirements at Top 20 Political Science Ph.D. Programs

Political Science Ph.D. Program	Required Methods Courses	Choice of Courses
Harvard University	3.5	Yes
Stanford University	2	No
Princeton University	0	
University of California--Berkeley	0	
University of Michigan--Ann Arbor	0	
Yale University	0	
Columbia University	1	Yes
Duke University	4	Yes
Massachusetts Institute of Technology	3	Yes
University of California--San Diego	2	No
University of North Carolina--Chapel Hill	0	
New York University	0	
University of California--Los Angeles	1	Yes
University of Chicago	0	
Ohio State University	2	No
University of Wisconsin--Madison	2	Yes
University of California--Davis	3	No
University of Rochester	3	No
Cornell University	0	
University of Pennsylvania	1	No

9. How does the change affect other academic units and existing programs at the University?

The change to degree requirements has no implications for other units/programs.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

We will notify current students via email and in-person advising meetings held once per semester. Students who completed the methodology requirements under the current rules are unaffected; the three currently required courses would fulfill the requirement under the proposed new rules.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

We currently have 38 Ph.D. students. This change is unlikely to affect enrollments. Increasing flexibility in meeting program requirements might slightly increase our applicant pool; however, we are limited by the graduate admissions target.

12.Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

None.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

PO 842: Since this course will be taught by Rosella Cappella Zielinkski and Jeremy Menchik in alternate years, there is minimal impact on each faculty member's existing course load. Both faculty have taught a reduced course load in recent years due to both parental and junior faculty leaves. Hence, teaching this new course once every other year should not cause either of them to reduce the frequency of currently or recently offered courses.

PO 844: Since PO 842 and PO 844 are intended to replace and expand upon the current PO 840, which Steven Rosenzweig currently teaches, offering PO 844 every year instead of PO 840 will not have any adverse effect on course offerings.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

None

15. Please describe the budgetary impact that the proposed change will have:

None

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes)[NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

NOTE: the current version of the Bulletin copy does not include the learning outcomes. I am inserting them in the proposed new text below, in addition to implementing the changes related to the present proposal.

PhD in Political Science

The Graduate Program in Political Science offers an intellectually stimulating and collegial environment for the training of PhD candidates. The program is highly selective, enrolling an average of six students a year, all of whom receive full funding. The Graduate Faculty in Political Science at Boston University is a diverse community of scholars stretching across several departments and schools. Students may also take advantage of the broader resources in the Boston area. Entering students must have a BA or MA. The program trains students in research and teaching methods, preparing them for positions in colleges and universities, research institutions, and government agencies. For a complete description of our program, please visit our website.

Learning Outcomes

1. Produce and defend an original and significant contribution to knowledge in the discipline of Political Science.

2. Demonstrate mastery of subject material by developing a minimum level of competence in five of the six fields of Political Science (American

Politics, Public Policy, Comparative Politics, International Relations, Political Theory, and Methodology) and a high level of competence in two of these fields.

3. Participate in professional academic community activities, such as attending local seminar series, presenting papers at conferences, and submitting papers to academic journals.

4. Be able to teach the discipline at the undergraduate level.

Course Requirements

Students are required to complete 64 graduate-level credits. Students entering the program from Boston University's BA/MA program will be able to transfer over some of their course credits by arrangement with the Director of Graduate Studies (DGS). Students are encouraged to take courses offered in related disciplines such as economics, philosophy, psychology, math/statistics, sociology, and history, and in other universities around the Boston area.

Selection of courses must be approved by the Director of Graduate Studies in the Department of Political Science. Courses may be drawn from the offerings of this and related departments subject to the following requirements.

Core Seminars

Four Core Seminars should be completed in Year 1:

- GRS PO 711 Approaches to the Study of American Politics
- GRS PO 751 Approaches to the Study of Comparative Politics
- GRS PO 771 Approaches to the Study of International Relations
- GRS PO 791 Approaches to the Study of Political Theory

Methodology

Three out of four graduate-level methodology courses are required:

- GRS PO 841 Quantitative Research Methods
- GRS PO 842 Qualitative Approaches to the Study of Political Science
- GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation
- GRS PO 844 Methods for Causal Inference

Students may petition the DGS to replace one or more of these courses with equivalent or more advanced courses from other departments.

Research Workshop

Two semesters of GRS PO 903/904 Research Workshop must be taken in Years 2 or 3.

Professional Development

GRS PO 702 Professional Development for PhD Candidates in Political Science must be taken in Year 2 or 3.

Language Requirement

There is no general language requirement. However, if knowledge of a foreign language is necessary for their research, students are encouraged to develop that competence prior to defending their PhD proposal.

Qualifying Examinations

As one element of the qualifying examination, students must submit an independent research paper of high quality. Typically, this will involve the substantial revision, expansion, and polishing of a graduate seminar paper. In addition, timed qualifying examinations are given in two fields of the student's choosing: American politics, comparative politics, international relations, public policy, and methodology. After passing all

three elements of the qualifying exam, students proceed to their dissertation work.

Dissertation and Final Oral Examination

Candidates shall demonstrate their abilities for independent study in a dissertation representing original research. Candidates must undergo a final oral examination in which they defend their dissertation before their committee and any others who may wish to attend. All portions of the dissertation and final oral examination must be completed as outlined in the GRS General Requirements for the Doctor of Philosophy Degree.

Any student who has successfully completed all course requirements and has passed the qualifying exam or written an MA thesis may request that a terminal master's degree be granted.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

N/A

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

N/A

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

N/A

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

N/A

Tuition/Fee Item	Amount

Examples:

Fulltime Tuition	*$25,490*
Graduate Student Services Fee	*$162*
Health and Wellness Fee	*$206*

or

Program Fee (bundled charge)	*$27,985*
Tuition component	*$21,985*
Fees component	*$6,000*

21. What is the average number of years for a full-time student to complete the program? 6

22. What is the maximum number of years allowed to complete the program?

7 without a petition to GRS; 8–9 in practice

23. If a credit-bearing certificate, should the students be eligible for Title IV funds? N/A

24. Please propose a CIP code for any new HEGIS (CIP – Classification of Instructional Programs used for IPEDS reporting https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55**):** N/A

25. Is the new HEGIS STEM eligible? (Contact the Registrar's Office with questions): N/A

26. Are you phasing out or replacing another program? If so, what program? N/A

BOSTON UNIVERSITY

Office of the Provost

Proposed Change to an Existing Degree: Academic Component

eCAP is Boston University's peer review process for the creation, modification, and dissolution of academic programs.

Please answer all relevant questions below. Consultation with the appropriate Associate Provost on a draft of the proposal is recommended.

Using the relevant template, please submit a budget even if no additional resources are needed.

Title of Degree (e.g., Bachelor of Arts in History): Ph.D. in Political Science

Proposing/Supporting Department: Political Science

Proposed Start Date: Fall 2020

1. Please provide the name, title, email address, and phone number of the primary contact person for this academic program:

Taylor Boas, Director of Graduate Studies, tboas@bu.edu, 617-353-4214

2. Please describe briefly the proposed change to the existing degree:

Our current methodology requirement is to take three specific research methods courses:

GRS PO 840 Political Analysis
GRS PO 841 Quantitative Research Methods
GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation

In a pair of new course proposals submitted concurrently with the present proposal, we plan to replace PO 840: Political Analysis with two new courses: PO 842: Qualitative Approaches to the Study of Political Science and PO 844: Methods for Causal Inference.

In keeping with this change in course offerings, we propose that the new methodology requirement be that students take **any three** graduate-level methods courses in political science. As of Fall 2020, the options for fulfilling this requirement will be:

PO 841: Quantitative Research Methods
PO 842: Qualitative Approaches to the Study of Political Science
PO 843: Techniques in Political Analysis: Maximum Likelihood Estimation
PO 844: Methods for Causal Inference

In the future, any new graduate-level methods courses in PO can also be used to fulfill this requirement.

This change was approved by a unanimous vote of the Graduate Faculty of Political Science (regular faculty plus Joint Programmatic Appointments) on September 25, 2019.

3. Please provide the academic rationale for the proposed change to the existing degree. This may include aspects related to budgetary issues, student demand, or peer/disciplinary trends:

Our graduate students are increasingly diverse in their methodological orientations. A large number of students are interested in learning advanced quantitative methods and using these methods in their dissertation research. Yet many other students take a primarily qualitative approach, involving archival research, elite interviews, participant observation, and interpretation of texts. Introducing an element of choice into the methodology requirement allows students to specialize in the methods most appropriate for their research, while also ensuring a broad grounding in the diverse approaches used in the discipline.

4. Please describe how the proposed change(s) advances the Strategic Plans of the department, of the school/college, and of the University:

The changes are consistent with the learning outcomes in the Department of Political Science:

1. Produce and defend an original and significant contribution to knowledge in the discipline of Political Science

2. Demonstrate mastery of subject material by developing a minimum level of competence in five of the six fields of Political Science (American Politics, Public Policy, Comparative Politics,

International Relations, Political Theory, and Methodology) and a high level of competence in two of these fields

3. Participate in professional academic community activities, such as attending local seminar series, presenting papers at conferences, and submitting papers to academic journals

4. Be able to teach the discipline at the undergraduate level

5. Please list all the program requirements for the current and revised programs so that review committees can easily see the changes: (Expand the table as needed and denote new courses in bold print and courses already approved for conveying Hub units with an asterisk. Please include total credits, specific courses, and any additional degree requirements. Note: New courses included in the degree that are intended to convey Hub units must be submitted separately for Hub unit approval via CourseLeaf)

Current program	Revised program
Each of the following 3 courses:	3 out of the following 4 courses:
GRS PO 840 Political Analysis (4 credits)	GRS PO 841 Quantitative Research Methods (4 credits)
GRS PO 841 Quantitative Research Methods (4 credits)	**GRS PO 842 Qualitative Approaches to the Study of Political Science (4 credits)**
GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation (4 credits)	GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation (4 credits)
	GRS PO 844 Methods for Causal Inference (4 credits)
UNCHANGED REQUIREMENTS BELOW:	UNCHANGED REQUIREMENTS BELOW:
GRS PO 711 Approaches to the Study of American Politics (4 credits)	GRS PO 711 Approaches to the Study of American Politics (4 credits)
GRS PO 751 Approaches to the Study of Comparative Politics (4 credits)	GRS PO 751 Approaches to the Study of Comparative Politics (4 credits)
GRS PO 771 Approaches to the Study of International Relations (4 credits)	GRS PO 771 Approaches to the Study of International Relations (4 credits)
GRS PO 791 Approaches to the Study of Political Theory (4 credits)	GRS PO 791 Approaches to the Study of Political Theory (4 credits)
Two semesters of GRS PO 903/904 Research Workshop (4 credits total)	Two semesters of GRS PO 903/904 Research Workshop (4 credits total)
GRS PO 702 Professional Development (2 credits)	GRS PO 702 Professional Development (2 credits)
30 additional elective credits	30 additional elective credits
Qualifying examination and dissertation	Qualifying examination and dissertation

6. How does this change reflect the result of program learning outcomes assessment and/or academic program review?:

Our assessments of the program in recent years have found that, while many students are taking advantage of new opportunities to pursue advanced training in quantitative methods and use these approaches in their research, those who focus primarily on qualitative methods are lacking in opportunities for methodological training. Some second-year papers and seminar papers evaluated in recent years have shown that students lack familiarity with such topics as comparative case study research designs. Introducing a new qualitative methods course and revising the methodology requirements to allow this course to count toward the three required courses ought to rectify this shortcoming.

7. Please list learning outcomes for the revised program:

There is no change to the learning outcomes:

1. Produce and defend an original and significant contribution to knowledge in the discipline of Political Science

2. Demonstrate mastery of subject material by developing a minimum level of competence in five of the six fields of Political Science (American Politics, Public Policy, Comparative Politics, International Relations, Political Theory, and Methodology) and a high level of competence in two of these fields

3. Participate in professional academic community activities, such as attending local seminar series, presenting papers at conferences, and submitting papers to academic journals

4. Be able to teach the discipline at the undergraduate level

8. How does the change place your program in the context of programs at peer institutions?

A recent review of the top 20 Ph.D. programs in political science conducted by our department found that most offer some degree of choice in their methodology requirements.

9. How does the change affect other academic units and existing programs at the University?

The change to degree requirements has no implications for other units/programs.

10. How will you notify current students of the proposed changes and implement the requirements? How will you assure that current students are able to complete their programs under the requirements that were in place at the time of their matriculation?

We will notify current students via email and in-person advising meetings held once per semester. Students who completed the methodology requirements under the current rules are unaffected; the three currently required courses would fulfill the requirement under the proposed new rules.

11. How many students are currently enrolled in the program? Does the school/college anticipate that this change will increase or decrease enrollments? If yes, please indicate the numerical (headcount) increase or decrease you anticipate. If yes, how will the school/college support the increased enrollments:

We currently have 38 Ph.D. students. This change is unlikely to affect enrollments. Increasing flexibility in meeting program requirements might slightly increase our applicant pool; however, we are limited by the graduate admissions target.

12.Please document any implications that the change has on professional accreditation or licensure at the program or school/college level:

None.

13. If the change includes a new course or courses, please indicate who will teach the course and how the rest of that faculty member's course load will be affected (courses(s) redistributed to other faculty, taught less frequently, no longer taught, etc.). Please be specific about affected courses. This information should be reflected in the budget form that accompanies the proposal, e.g. the cost for a new faculty member to teach the new course or a redistributed course:

PO 842: Since this course will be taught by Rosella Cappella Zielinkski and Jeremy Menchik in alternate years, there is minimal impact on each faculty member's existing course load. Both faculty have taught a reduced course load in recent years due to both parental and junior faculty leaves. Hence, teaching this new course once every other year should not cause either of them to reduce the frequency of currently or recently offered courses.

PO 844: Since PO 842 and PO 844 are intended to replace and expand upon the current PO 840, which Steven Rosenzweig currently teaches, offering PO 844 every year instead of PO 840 will not have any adverse effect on course offerings.

14. Please list other resources needed including new staff, IT, technology enhanced classrooms, office space, and other facilities. This information should be reflected in the budget:

None

15. Please describe the budgetary impact that the proposed change will have:

None

16. Please provide the Bulletin copy (exactly as it should appear) related to the proposed change, including all text connected to the program (requirements, description, learning outcomes)[NOTE: this Bulletin copy is in a final form and cannot be changed. It must include program learning outcomes.]:

NOTE: the current version of the Bulletin copy does not include the learning outcomes. I am inserting them in the proposed new text below, in addition to implementing the changes related to the present proposal.

PhD in Political Science

The Graduate Program in Political Science offers an intellectually stimulating and collegial environment for the training of PhD candidates. The program is highly selective, enrolling an average of six students a year, all of whom receive full funding. The Graduate Faculty in Political Science at Boston University is a diverse community of scholars stretching across several departments and schools. Students may also take advantage of the broader resources in the Boston area. Entering students must have a BA or MA. The program trains students in research and teaching methods, preparing them for positions in colleges

and universities, research institutions, and government agencies. For a complete description of our program, please visit our website.

Learning Outcomes

1. Produce and defend an original and significant contribution to knowledge in the discipline of Political Science.

2. Demonstrate mastery of subject material by developing a minimum level of competence in five of the six fields of Political Science (American Politics, Public Policy, Comparative Politics, International Relations, Political Theory, and Methodology) and a high level of competence in two of these fields.

3. Participate in professional academic community activities, such as attending local seminar series, presenting papers at conferences, and submitting papers to academic journals.

4. Be able to teach the discipline at the undergraduate level.

Course Requirements

Students are required to complete 64 graduate-level credits. Students entering the program from Boston University's BA/MA program will be able to transfer over some of their course credits by arrangement with the Director of Graduate Studies (DGS). Students are encouraged to take courses offered in related disciplines such as economics, philosophy, psychology, math/statistics, sociology, and history, and in other universities around the Boston area.

Selection of courses must be approved by the Director of Graduate Studies in the Department of Political Science. Courses may be drawn from the offerings of this and related departments subject to the following requirements.

Core Seminars

Four Core Seminars should be completed in Year 1:

- GRS PO 711 Approaches to the Study of American Politics
- GRS PO 751 Approaches to the Study of Comparative Politics
- GRS PO 771 Approaches to the Study of International Relations
- GRS PO 791 Approaches to the Study of Political Theory

Methodology

Three out of four graduate-level methodology courses are required:

- GRS PO 841 Quantitative Research Methods
- GRS PO 842 Qualitative Approaches to the Study of Political Science
- GRS PO 843 Techniques in Political Analysis: Maximum Likelihood Estimation
- GRS PO 844 Methods for Causal Inference

Students may petition the DGS to replace one or more of these courses with equivalent or more advanced courses from other departments.

Research Workshop

Two semesters of GRS PO 903/904 Research Workshop must be taken in Years 2 or 3.

Professional Development

GRS PO 702 Professional Development for PhD Candidates in Political Science must be taken in Year 2 or 3.

Language Requirement

There is no general language requirement. However, if knowledge of a foreign language is necessary for their research, students are encouraged to develop that competence prior to defending their PhD proposal.

Qualifying Examinations

As one element of the qualifying examination, students must submit an independent research paper of high quality. Typically, this will involve the substantial revision, expansion, and polishing of a graduate seminar paper. In addition, timed qualifying examinations are given in two fields of the student's choosing: American politics, comparative politics, international relations, public policy, and methodology. After passing all three elements of the qualifying exam, students proceed to their dissertation work.

Dissertation and Final Oral Examination

Candidates shall demonstrate their abilities for independent study in a dissertation representing original research. Candidates must undergo a final oral examination in which they defend their dissertation before their committee and any others who may wish to attend. All portions of the dissertation and final oral examination must be completed as outlined in the GRS General Requirements for the Doctor of Philosophy Degree.

Any student who has successfully completed all course requirements and has passed the qualifying exam or written an MA thesis may request that a terminal master's degree be granted.

The following questions relate to a change in the format, e.g. blended, online, face-to-face, of an existing degree.

17. For proposed changes to format of existing programs, please provide an indication of non-standard scheduling for the proposed format:

N/A

18. Please provide a communication and promotion plan for the proposed changed format. Are you working with an outside vendor/contractor? If yes, please outline this relationship and the role of the vendor:

N/A

19. If applicable, please provide a request for non-standard tuition rates for the proposed changed delivery format:

N/A

20. What charges (tuition, fees, etc.) are to be applied to this program? How will the charges be structured? Please make the figures correspond with the Budget Form submission.

N/A

Tuition/Fee Item	**Amount**

Examples:

Fulltime Tuition	*$25,490*
Graduate Student Services Fee	*$162*
Health and Wellness Fee	*$206*

or

Program Fee (bundled charge)	*$27,985*
Tuition component	*$21,985*
Fees component	*$6,000*

21. What is the average number of years for a full-time student to complete the program? 6

22. What is the maximum number of years allowed to complete the program?

7 without a petition to GRS; 8–9 in practice

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: CAS HISTORY DATE SUBMITTED: 10/24/19

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED: HI 856

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

CAS/GRS New Course Proposal Form

*To be used only for proposing new CAS courses **without BU Hub credit** as well as for **all** new GRS courses.*

This completed form and all required documents should be submitted as PDF files to either Sr. Academic Administrator Peter Law pgl@bu.edu (for CAS and CAS/GRS "piggyback" courses) or to Graduate Services Associate Casey Dziuba grsgs@bu.edu (for GRS-only courses). Please contact them for information or assistance, if necessary.

DEPARTMENT OR PROGRAM: CAS HISTORY DATE SUBMITTED: 10/24/19

COURSE NUMBER(S) (include college code—CAS or GRS): GRS HI 856

NOTE: A course number cannot be reused if a different course using that number has been offered in the past five years.

COURSE TITLE: HISTORICAL METHODS

INSTRUCTOR(S): Brooke Blower

TO BE FIRST OFFERED: Sem./Year: Fall / 2020

SHORT TITLE: The "short title" appears in the course inventory, on the Link University Class Schedule, and on student transcripts and must be 15 characters maximum *including spaces*. It should be as clear as possible.

H	I	S		M	E	T	H	O	D	S				

COURSE DESCRIPTION: This is the description that appears in the CAS and/or GRS Bulletin and The Link. It is the first guide that students have as to what the course is about. The description can contain no more than 40 words.

This seminar explores the variety of methods historians employ to research and write their histories as well as influential theoretical approaches (including from other fields such as anthropology, geography, and sociology) and their practical applications for historians.

PREREQUISITES/COREQUISITES: Indicate "None" or list all elements of the prerequisites/corequisites, clearly indicating "AND" or "OR" where appropriate. Here are three examples: "Junior standing or CAS ZN300 or consent of instructor"; "CAS ZN108 and CAS ZN203 and CAS PQ206; or consent of instructor"; "For SED students only."

1. State the prerequisites and/or corequisites: None

2. Explain the need for these prerequisites and/or corequisites:

CREDITS: (check one)

☐ Half course: 2 credits ☐ Variable: Please describe.

X Full course: 4 credits ☐ Other: Please describe.

Provide a rationale for this number of credits, bearing in mind that for a CAS or GRS course to carry 4 credits, 1) it must normally be scheduled to meet at least 150 minutes/week, AND 2) combined instruction and assignments, as detailed in the attached course syllabus, must anticipate at least 12 total hours/week of student effort to achieve course objectives.

This graduate seminar meets for 165 minutes per week and anticipates well in advance of 12 total hours of student effort.

DIVISIONAL STUDIES CREDIT NOTE: *If this course intended to fulfill CAS Divisional Studies requirements, do not use this proposal form.* The course must be proposed through the BU Hub process via CourseLeaf. Refer to http://www.bu.edu/cas/proposing-cas-courses-for-the-bu-hub/ for instructions.

HOW FREQUENTLY WILL THE COURSE BE OFFERED?

☐ Every semester ☐ Once a year, fall ☐ Once a year, spring ☐ Every other year

X Other: Explain: This course will be offered either in Fall or Spring every year or fewer dependent on graduate cohorts and departmental requirements

NEED FOR THE COURSE: Explain the need for the course *and* its intended impact. How will it strengthen your overall curriculum? Will it be required or fulfill a requirement for degrees/majors/minors offered by your department/program or for degrees in other departments/school/colleges? Which students are most likely to be served by this course? How will it contribute to program learning outcomes for those students? If you see the course as being of "possible" or "likely" interest to students in another departments/program, please consult directly with colleagues in that unit. (You must *attach appropriate cognate comments using cognate comment form* if this course is intended to serve students in specific other programs. See FURTHER INFORMATION below about cognate comment.)

The course (taught under a topics section that was not repeatable) is a regular staple of our graduate curriculum. It is intended to make its participants more skilled, creative, and reflective practitioners of history. The study of historical methodology is intended to complement our current historiography required offerings.

ENROLLMENT: How many undergraduate and/or graduate students do you expect to enroll in the initial offering of this course?

5-10

CROSS-LISTING: Is this course to be cross-listed or taught with another course? If so, specify. Chairs/directors of all cross-listing units must co-sign this proposal on the signature line below.

N/A

OVERLAP: Relationship to other courses in your program or others: Is there any significant overlap between this course and others offered by your department/program or by others? (You must *attach appropriate cognate comments using cognate comment form* if this course might be perceived as overlapping with courses in another department/program. See FURTHER INFORMATION below.) N/A

FACILITIES AND EQUIPMENT: What, if any, are the new or special facilities or equipment needs of the course (e.g., laboratory, library, instructional technology, consumables)? Are currently available facilities, equipment, and other resources adequate for the proposed course? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)
N/A

STAFFING: How will the staffing of this course, in terms of faculty and, where relevant, teaching fellows, affect staffing support for other courses? For example, are there other courses that will not be taught as often as now? Is the staffing of this course the result of recent or expected expansion of faculty? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)
This course had previously been offered as a special topics; it will not impact any staffing.

BUDGET AND COST: What, if any, are the other new budgetary needs or implications related to the start-up or continued offering of this course? If start-up or continuation of the course will entail costs not already discussed, identify them and how you expect to cover them. (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.) N/A

EXTERNAL PROGRAMS: If this course is being offered at an external program/campus, please provide a brief description of that program and attach a CV for the proposed instructor. N/A

ADDITIONAL DOCUMENTS THAT MUST BE SUBMITTED FOR THIS PROPOSAL TO BE CONSIDERED:

- A complete week-by-week SYLLABUS with student learning objectives, readings, and assignments that reflects the specifications of the course described in this proposal; that is, appropriate level, credits, etc. (See guidelines on "Writing a Syllabus" on the Center for Teaching & Learning website.) A typical, effective syllabus template is provided here under "Curriculum Review & Modification".
- Be sure that syllabus includes your **make-up quiz/exam policy** and expectations for academic honesty, with **URL for pertinent undergraduate or GRS academic conduct code(s).**
- Cognate comment from chairs or directors of relevant departments and/or programs. Use the form here under "Curriculum Review & Modification." You can consult with Dean Joseph Bizup (CAS) at casuap@bu.edu or Dean Emily Barman (GRS) at eabarman@bu.edu to determine which departments or programs inside and outside of CAS/GRS would be appropriate.

DEPARTMENT CONTACT NAME & POSITION: **Cady Steinberg**

DEPARTMENT ADMINSITRATOR_

DEPARTMENT CONTACT EMAIL & PHONE: **CADY8590@BU.EDU 617-353-2555**

Signature(s) required:

DEPARTMENT APPROVAL: _____ 10/25/19

Department Chair — Date

_____ _____

Other Department Chair(s) (required for cross-listed courses) — Date

revised 03/21/2019

Professor Brooke L. Blower
History Department, Boston University
226 Bay State Road, Rm. 307
617-353-8303
bblower@bu.edu

Seminar:
Rm: HIS 304
Office Hours:

GRS8xx: Historical Methods

This seminar focuses on a variety of methods historians employ to research and write their histories as well as influential theoretical approaches (including from other fields such as anthropology, geography, and sociology) and their practical applications for historians. How does one go about recovering the mental stuff of past societies and to what ends? The primary goal of the course is to make its participants more skilled, creative, and reflective practitioners of history.

Copies of all the readings have been placed on reserve at Mugar. Finances permitting, it is advisable to buy volumes that will be useful to you as references in years to come.

Assignments:

1. Two short presentations (lead one seminar by reporting on a classic and posing class an opening question, present once on research resources)

2. Reading responses (1-2 pgs) for 5 weeks, due by 11 a.m on the day of class in question

3. "Ing" paper on a historical practice (15-20 pgs): two substantial rounds of drafting.

All written work should be submitted to Professor Blower's mailbox on the third floor of 226 Bay State Road.

Your grade will be based on the overall quality of your written work as well as your contribution to class discussion. Auditors for credit need not complete the writing assignments (though they may in whole or in part), but they should participate in the life of the seminar.

SCHEDULE OF CLASSES AND READINGS

Introduction

Daniel T. Rodgers, "Thinking in Verbs," *Intellectual History Newsletter* 18 (1996): 21-3

Approaches to Studying History

Thick Description and Cultural Opacity

Clifford Geertz, "Thick Description" and "Ideology as a Cultural System" in *The Interpretation of Cultures* (1973)

Robert Darnton, *The Great Cat Massacre and Other Episodes in French Cultural History* (1984), intro and ch. 2

Michael Braddick, "The Politics of Gesture," *Past & Present* (Supplement 4, 2009): 9-35

Kenneth Greenberg, "The Nose, the Lie, and the Duel in the Antebellum South," *AHR* 95.1 (Feb. 1990)

RECOMMENDED CLASSIC: Carlo Ginzburg, *The Cheese and the Worms* (1976)

IN CLASS SOURCES: Charlie Chaplin sings in *Modern Times* (1936)

A. A. Allen televangelizing in the 1960s

Rock concert footage in Boston (1970)

RESOURCE PRESENTATION: A/V resources

Paradigms and Discourses

Thomas Kuhn, *The Structure of Scientific Revolutions* (1962), chs. 1- first paragraph of ch. 10

Daniel T. Rodgers, *Contested Truths* (1987), preface

Gail Bederman, *Manliness and Civilization* (1995), ch. 1

Daniel T. Rodgers, *The Age of Fracture* (2011), ch. 2

RECOMMENDED CLASSIC: Jackson Lears, "The Concept of Cultural Hegemony: Problems and Possibilities," *AHR* 90.3 (June 1985)

IN CLASS SOURCES: The Port Huron Statement (1962)

1960s *Playboy* cartoons

RESOURCE PRESENTATION: dictionaries

Playing with Scales

Richard Brown, "Microhistory and the Post-Modern Challenge," *Journal of the Early Republic* 23.1 (Spring 2003): 1-20

Matti Peltonen, "Clues, Margins, and Monads: The Micro-Macro Link in Historical Research," *History & Theory* 40 (Oct. 2001): 347-59

Ian Tyrrell, "Reflections on the Transnational Turn in United States History: Theory and Practice," *Journal of Global History*, 3 (November 2009), pp. 453-474

Bernhard Struck, Kate Ferris and Jacques Revel. "Introduction: Space and Scale in Transnational History," *International History Review* 33.4 (Dec. 2011), 573-84.

Laurel Thatcher Ulrich, *A Midwife's Tale* (1991), intro and chapter 2.

Thomas Bender, *A Nation Among Nations* (2006), chapter 2.

RECOMMENDED CLASSIC: Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II* (1949)

IN CLASS SOURCES: newspaper front pages

Ellis Island oral histories

RESOURCE PRESENTATION: periodicals

Thinking with Things

Langdon Winner, "Do Artifacts Have Politics?" *Daedalus* 109.1 (Winter 1980): 121-136.

Michael Zakim, "Sartorial Ideologies: From Homespun to Ready-Made," *AHR* 106.5 (Dec. 2001): 1553-86

Miles Orvell, *The Real Thing* (1989), Part II: intro and ch. 2, Part III: intro and ch. 5

Kristen Hoganson, "Buying Into Empire," in Alfred McCoy, ed., *Colonial Crucible* (2009)

William Rankin, "The Geography of Radionavigation and the Politics of Intangible Artifacts," *Technology and Culture* 55.3 (July 2014): 622-674

RECOMMENDED CLASSIC: Arjun Appadurai, *The Social Life of Things* (1986)

IN CLASS SOURCES: souvenirs

RESOURCE PRESENTATION: wildcard

Emotions and Feeling

Joanna Bourke, "Fear and Anxiety: Writing about Emotion in Modern History," *History Workshop Journal* 55 (2003): 111-33.

Christina Kotchemidova, "From Good Cheer to 'Drive-By Smiling': A Social History of Cheerfulness," *Journal of Social History* 39.1 (Fall 2005): 5-37

Susan J. Matt, "You Can't Go Home Again: Homesickness and Nostalgia in U.S. History," *Journal of American History* 94.2 (September 2007): 469-97

Dawn Keetley, "From Anger to Jealousy: Explaining Domestic Homicide in Antebellum America," *Journal of Social History*, 42.2 (Winter 2008): 269-97

Monique Scheer, "Are Emotions a Kind of Practice (And Is that What Makes Them Have a History)?" *History and Theory* 51 (May 2012): 193-220

RECOMMENDED CLASSIC: Peter Gay, *Freud for Historians* (1985)

IN CLASS SOURCES: portraits

RESOURCE PRESENTATION: wildcard

Proposal workshops

Class Cancelled

Practices in Historical Context

Trading

Jean-Christophe Agnew, *Worlds Apart* (1988), 17-40

Pekka Hämäläinen, *The Comanche Empire* (2008), chs. 2-4

Jonathan Levy, "Contemplating Delivery: Futures Trading and the Problem of Commodity Exchange in the United States, 1875-1905," *AHR* 111.2 (April 2006): 307-335

William Leach, *Land of Desire* (1993), intro., chs. 1-3

RECOMMENDED CLASSIC: Marcel Mauss, *The Gift* (1925)

IN CLASS SOURCES: 20th century American art and photography

RESOURCE PRESENTATION: wildcard

Knowing

James C. Scott, *Seeing Like a State* (1998), introduction and part I

Ian Hacking, "Biopower and the Avalanche of Printed Numbers," *Humanities in Society* 5, no. 3&4 (1982): 279-295

Dan Bouk, *How Our Days Became Numbered* (2015), preface + chapter 5

Nick Cullather, "The Foreign Policy of the Calorie," *AHR* 112.2 (April 2007): 337-64

RECOMMENDED CLASSIC: Michel Foucault, *The Archaeology of Knowledge* (1972)

IN CLASS SOURCE: State Department decimal filing system guide

World War I food posters

RESOURCE PRESENTATION: government documents

Mapping

Richard White, "What is Spatial History?"
https://web.stanford.edu/group/spatialhistory/cgi-bin/site/pub.php?id=29

Philip J. Ethington, "Placing the Past: 'Groundwork' for a Spatial Theory of History," *Rethinking History* 11.4 (Dec 2007): 465-93

Richard White, *Railroaded: The Transcontinentals and the Making of Modern America* (2011), ch. 4

Ruth Oldenziel, "Islands: The United States as a Networked Empire," in Gabrielle Hecht, ed., *Entangled Geographies: Empire and Technologies in the Global Cold War* (Cambridge, Mass., 2011), 13–41

Andrew Friedman, *Covert Capital: Landscapes of Denial and the Making of U.S. Empire in the Suburbs of Northern Virginia* (2013), chs 1-2

RECOMMENDED CLASSIC: Henri Lefebvre, *The Production of Space* (1974)

IN CLASS SOURCES: GIS: slave trade in two minutes

Mapping Occupation (Union troops in the South)

Isao Hashimoto, "1945-1998"

RESOURCE PRESENTATION: maps

Identifying

Rogers Brubaker and Frederick Cooper, "Beyond Identity," *Theory and Society*, 29 (2000): 1-47.

Peggy Pascoe, *What Comes Naturally* (2009), chs. 4 and 5

George Chauncey, *Gay New York* (1994), chs. 4 and 7

Craig Robertson, *The Passport in America* (2010), intro., chs. 2, 4, 9-10

RECOMMENDED CLASSIC: Vance Packard, *The Status Seekers* (1959)

IN CLASS SOURCES: Chicago Vice Commission report (1911)

American novels: character sketches

Musical performances

Othering

Andrew Rotter, "Saidism without Said: Orientalism and U.S. Diplomatic History," *AHR* 105.4 (Oct. 2000): 1205-17.

Karen O. Kupperman, *Indians and English* (2000), introduction, chs. 5-7

Susan Carruthers, "Latrines as the Measure of Men: American Soldiers and the Politics of Disgust in Occupied Europe and Asia," *Diplomatic History* 42.1 (January 2018): 109-137.

Christina Klein, *Cold War Orientalism* (2003), intro and ch. 5

RECOMMENDED CLASSIC: Edward Said, *Orientalism* (1979)

IN CLASS SOURCE: Julian Ralph travel writings

Rudyard Kipling on Chicago

Performing

Erving Goffman, "Communication Out of Character," in *The Presentation of Self in Everyday Life* (1959)

Peter Burke, "Performing History: The Importance of Occasions," *Rethinking History* 9.1 (March 2005): 35-52

Walter Johnson, *Soul by Soul* (1999), introduction and chs. 3-6

David Scobey, "Anatomy of the Promenade: The Politics of Bourgeois Sociability in Nineteenth-Century New York," *Social History* 17 (1992): 203-227

RECOMMENDED CLASSIC: Judith Butler, *Gender Trouble* (1990)

IN CLASS SOURCES: William B. Huie, "The Shocking Story of Approved Killing in Mississippi," *Look* (1956)

Scene from *Some Like It Hot* (1959)

Writing Workshop

Final paper due, by 2pm to Prof. Blower's mailbox

Boston University College and Graduate School of Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS New Course Proposal Form

*To be used only for proposing new CAS courses **without BU Hub credit** as well as for **all** new GRS courses.*

This completed form and all required documents should be submitted as PDF files to either Sr. Academic Administrator Peter Law pgl@bu.edu (for CAS and CAS/GRS "piggyback" courses) or to Graduate Services Associate Casey Dziuba grsgs@bu.edu (for GRS-only courses). Please contact them for information or assistance, if necessary.

DEPARTMENT OR PROGRAM WLL/ MFA in Translation DATE SUBMITTED: 10-10-19

COURSE NUMBER (include college code—CAS or GRS): LJ 660

NOTE: A course number cannot be reused if a different course using that number has been offered in the past five years.

COURSE TITLE: Haruki Murakami and His Sources

INSTRUCTOR(S): Anna Zielinska-Elliott

TO BE FIRST OFFERED: Sem./Year: 2020 / 2021

SHORT TITLE: The "short title" appears in the course inventory, on the Link University Class Schedule, and on student transcripts and must be 15 characters maximum *including spaces*. It should be as clear as possible.

M	U	R	A	K	A	M	I	S	O	U	R	C	E	S

COURSE DESCRIPTION: This is the description that appears in the CAS and/or GRS Bulletin and The Link. It is the first guide that students have as to what the course is about. The description can contain no more than 40 words.

Students read works by Haruki Murakami and by writers who shaped him or were shaped by him, reflect on the nature of intertextuality, and gain a perspective on contemporary literature as operating within a global system of mutual influence.

PREREQUISITES/COREQUISITES: Indicate "None" or list all elements of the prerequisites/corequisites, clearly indicating "AND" or "OR" where appropriate. Here are three examples: "Junior standing or CAS ZN300 or consent of instructor"; "CAS ZN108 and CAS ZN203 and CAS PQ206; or consent of instructor"; "For SED students only."

State the prerequisites and/or corequisites:

None

Explain the need for these prerequisites and/or corequisites:

n/a

CREDITS: (check one)

☐ Half course: 2 credits ☐ Variable: Please describe.

■ Full course: 4 credits ☐ Other: Please describe.

Provide a rationale for this number of credits, bearing in mind that for a CAS or GRS course to carry 4 credits, 1) it must normally be scheduled to meet at least 150 minutes/week, AND 2) combined instruction and assignments, as detailed in the attached course syllabus, must anticipate at least 12 total hours/week of student effort to achieve course objectives.

This course is piggy-backed with LJ 460, Haruki Murakami and His Sources. It meets face to face for the required number of hours. It also has a heavy reading load and writing component: students have reading assignments before every single class. They also write two mid-length papers, one long paper, weekly responses to readings, and prepare a thorough presentation about a writer or literary trend. This workload fulfills the requirements needed in order for students to receive 4 credits.

Graduate students will have more advanced readings, will write longer papers, and will meet with the instructor for an additional hour every other week to discuss the additional readings.

DIVISIONAL STUDIES CREDIT NOTE: *If this course intended to fulfill CAS Divisional Studies requirements, do not use this proposal form.* The course must be proposed through the BU Hub process via CourseLeaf. Refer to http://www.bu.edu/cas/proposing-cas-courses-for-the-bu-hub/ for instructions.

HOW FREQUENTLY WILL THE COURSE BE OFFERED?

☐ Every semester ☐ Once a year, fall ☐ Once a year, spring ■ Every other year, spring

☐ Other: Explain:

NEED FOR THE COURSE: Explain the need for the course *and* its intended impact. How will it strengthen your overall curriculum? Will it be required or fulfill a requirement for degrees/majors/minors offered by your department/program or for degrees in other departments/school/colleges? Which students are most likely to be served by this course? How will it contribute to program learning outcomes for those students? If you see the course as being of "possible" or "likely" interest to students in another departments/program, please consult directly with colleagues in that unit. (You must *attach appropriate cognate comments using cognate comment form* if this course is intended to serve students in specific other programs. See FURTHER INFORMATION below about cognate comment.)

This course has been offered several times in the LJ451 Topics in Japanese Literature series. It has been quite popular and we feel that it should become a separate course. It is the only literature course in WLL dealing with one contemporary author, who also happens to be one of the most popular writers in the world today and is on everyone's short list for the Nobel Prize in Literature. Students also read works by fifteen, mostly American, writers. The course deals not only with literary influences, but also with cinema and music, which appeals to 21st-c. learners. The last three times the course was offered it was cross-listed with Comp Lit and English.

ENROLLMENT: How many undergraduate and/or graduate students do you expect to enroll in the initial offering of this course?

Since the course will be piggy-backed on LJ460, we expect the enrollment of a couple of graduate students on top of the undergraduate enrollment of 25.

CROSS-LISTING: Is this course to be cross-listed or taught with another course? If so, specify. Chairs/directors of all cross-listing units must co-sign this proposal on the signature line below.

OVERLAP: Relationship to other courses in your program or others: Is there any significant overlap between this course and others offered by your department/program or by others? (You must *attach appropriate cognate comments using cognate comment form* if this course might be perceived as overlapping with courses in another department/program. See FURTHER INFORMATION below.)

No.

FACILITIES AND EQUIPMENT: What, if any, are the new or special facilities or equipment needs of the course (e.g., laboratory, library, instructional technology, consumables)? Are currently available facilities, equipment, and other resources adequate for the proposed course? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

This course will only require the usual classroom equipment – a projector, a dvd player, etc.

STAFFING: How will the staffing of this course, in terms of faculty and, where relevant, teaching fellows, affect staffing support for other courses? For example, are there other courses that will not be taught as often as now? Is the staffing of this course the result of recent or expected expansion of faculty? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

This course has been offered by Anna Zielinska-Elliott, who will continue offering it.

BUDGET AND COST: What, if any, are the other new budgetary needs or implications related to the start-up or continued offering of this course? If start-up or continuation of the course will entail costs not already discussed, identify them and how you expect to cover them. (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

No.

EXTERNAL PROGRAMS: If this course is being offered at an external program/campus, please provide a brief description of that program and attach a CV for the proposed instructor.

n/a

ADDITIONAL DOCUMENTS THAT MUST BE SUBMITTED FOR THIS PROPOSAL TO BE CONSIDERED:

- A complete week-by-week SYLLABUS with student learning objectives, readings, and assignments that reflects the specifications of the course described in this proposal; that is, appropriate level, credits, etc. (See guidelines on "Writing a Syllabus" on the Center for Teaching & Learning website.) A typical, effective syllabus template is provided here under "Curriculum Review & Modification".
- Be sure that syllabus includes your expectations for academic honesty, with URL for pertinent undergraduate or GRS academic conduct code(s).
- Cognate comment from chairs or directors of relevant departments and/or programs. Use the form here under "Curriculum Review & Modification." You can consult with Dean Joseph Bizup (CAS) at casuap@bu.edu or Dean Emily Barman (GRS) at eabarman@bu.edu to determine which departments or programs inside and outside of CAS/GRS would be appropriate.

DEPARTMENT CONTACT NAME & POSITION: **Anna Zielinska-Elliott, Master Lecturer**

DEPARTMENT CONTACT EMAIL & PHONE: **AELLIOTT@BU.EDU, 617-358-0418**

Signature(s) required:

DEPARTMENT APPROVAL: _____ **10-10-19**

Department Chair — Date

_____ _____

Other Department Chair(s) (required for cross-listed courses) — Date

revised 10/11/2017

Boston University Spring 2021
Haruki Murakami and His Sources

Time and place: MWF
Instructor: Anna Zielinska-Elliott **E-mail**: aelliott@bu.edu
Office: 745 Commonwealth Ave., Room 613B **Office Hours**: TBA

Course description
The class will follow the development of the work of Haruki Murakami, the most popular living Japanese writer and someone known for the "Western" elements in his writing. Looking at his almost forty-year-long writing career, we will examine some of the sources of his inspiration and models in order to see whether these might explain some of his astounding international success. These sources will include influences the author himself admits to as well as others he may not even be aware of. Students will be encouraged to make their own connections to other literary, cinematic, or musical inspirations for Murakami's writing. Readings will be in English, but students who are fluent in Japanese are welcome to read texts in the original (the short stories covered in class will be made available in Japanese on Blackboard). Reading material will come from the assigned books and short stories/articles available on the course Blackboard site. These will be furnished in the form of weblinks or .pdf, .docx, or other downloadable formats. Students are expected to prepare each reading prior to the class for which it has been assigned. In addition to readings, students may also be asked to watch video clips.

Credits and Prerequisites
This is a 4-credit course. There are no prerequisites, other than an interest in Haruki Murakami or love of books. Or both.

Course Materials.
Books students are required to purchase:
Raymond Chandler. *The Long Goodbye* (Vintage Crime 1998 or another edition)
Murakami Haruki. *A Wild Sheep Chase*, Alfred Birnbaum, trans. (Vintage 2002)
-- *Norwegian Wood.* Jay Rubin, trans. (Vintage 2000)
--*The Strange Library*. Ted Goossen, trans. (Knopf 2014)
Graham Allen. *Intertextuality* (Routledge 2000)
Matthew Carl Strecher. *The Forbidden Words of Haruki Murakami* (University of Minnesota Press 2014))
Rebecca Suter. *The Japanization of Modernity* (Harvard University Asia Center 2008)

Course objectives
The primary goal of this course is to familiarize students with the writing of Haruki Murakami and place it in the larger context of world literature; that is, to learn to read Murakami as a global writer rather than solely as a Japanese writer.

In addition, the course has three secondary aims:

1. To familiarize students with works of a number of other, mostly American, writers, some well known, some a little less so, and to see their writings in a broader context, as inspirations for other writers.
2. To present late 20th and early 21st century Japanese literary works as the product of many cultural trends, some domestic, some foreign, and some transcending national boundaries altogether.
3. To make students reflect on the concept of intertextuality, using the example of Murakami's writing, and see it in the broader sense not only of literature, but also advertising, music, art, etc.

Course outcomes
By the end of the course, as a result of readings and class discussions, students will
- have a deeper insight into Murakami's writing;
- be able to recognize certain patterns in his work, and more clearly see the directions in which it progresses;
- demonstrate familiarity with some works of American literature and see some well-known works in a new light as inspirations for other world literatures;
- demonstrate an ability to find connections and possible inspirations in literature as well as in other art forms, as a result of . having reflected on the notion of intertextuality and the different forms it has taken in the case of Murakami,
- gain a deeper understanding of genre and style, and the role of translation in reading literature

Course Policies

Grading. Grades will be determined on the following basis:

Class performance (based on a combination of attendance, preparation, and participation)	30%
Reading summary or author presentations	5%
Blog (10 posts)	5%
Pop quizzes on readings	10%
2 shorter papers	20%
Final paper/project	30%

Letter grades will be given according to the following scale: (+ and – not indicated) A – 90-100%, B – 80-89%, C – 70-79%, D- 60-69%, F- 0-59%.

1. Attendance and class performance. There are three class meetings a week and a bi-weekly one-hour long meeting for graduate students only (time TBA). Three class meetings can be missed. Each additional absence will result in a reduction of 1% from the final grade. In case of sickness, students should e-mail the instructor.

Students are expected to come prepared and to actively participate in class. **Cell phones are to be silenced and put away.** Lack of participation will negatively affect the final grade. Students are expected to prepare the assigned readings and their participation in class discussions will be evaluated. If it is clear that you are not coming to class prepared and are not familiar with the material, your preparation and participation grades will be lowered.

The last day to drop the class (**without** a "W" grade) is …….. The last day to drop the class (**with** a "W" grade) is ……..

2. *Reading summary, discussion questions or author presentations.* Each student will be assigned 1) two presentations about two writers or 2) one presentation on a writer and a summary of a critical accompanied by 3-4 discussion questions to be sent to the class beforehand. The presentations about writers are to be about 10-15 minutes in length and are to cover the writer's life, main works, etc. Discussion questions are to be posted on Confluence/Blackboard by noon on the day preceding the class for which the reading is assigned. The student will also be responsible for leading the class discussion.

3. Class blog. Students are expected to write comments on the Class blog every week (for a total of 10 times). Comments are to describe your impressions of the readings or information relating to Murakami, other writers discussed in class or, possibly, other issues relating to intertextuality. All students will be able to sign into the Class Blog with their BU id and Kerberos password.

4. *Quizzes*. There will be unannounced quizzes to check knowledge of the readings assigned for a given day. A student who has done the assigned readings should have no trouble answering the questions correctly. There will be no make-ups, but one lowest quiz score will be dropped.

5. *Papers*. Graduate students will be asked to write two papers (of 1800-2000 words). For students studying literary translation, the first paper will be an analysis of an early translation of one of Haruki Murakami's books, addressing the abridgments and editorial changes introduced by the translator and editor. Graduate students not fluent in Japanese will write a comparative analysis of Murakami's *A Wild Sheep Chase* and Chandler's *The Long Goodbye* or Conrad's *Heart of Darkness*, with special attention to style and plot elements. The second paper will compare two existing translations of *Norwegian Wood.*

6. *Final paper/project.* Students are expected to write a final paper or work on a final project. These can be:
- (for Literary Translation MFA students only) a 4000-word paper comparing the style and approach of two Murakami translators (chosen from among four).
- 4000-word paper on a topic relating to the material covered in class. This should be an analytical paper addressing issues of intertextuality in Murakami or an attempt at a short comparative study. You can, for example, argue for a text we haven't discussed in class as a possible source of inspiration.
- creative writing project: write a short, 9-10 page double-spaced story in the style of Murakami with a 1200-1500 word paper explaining your stylistic choices and influences.

- another project related to the material covered in class to be discussed with and approved by the instructor.

Late papers will be graded down 20% for the first day and 10% for each day after that.

GRS Academic Conduct Code
Cheating and plagiarizing violate the Academic Conduct Code to which all BU students are bound, and will be punished. **Students are responsible for knowing and understanding the provisions of the GRS Academic Conduct Code. Ignorance of the Code is not an excuse for its violation.** You can find the code at:
https://www.bu.edu/cas/files/2017/02/GRS-Academic-Conduct-Code-Final.pdf

Other Resources
Students facing difficulties are encouraged to come to see the instructor during office hours.

Learning Disabilities
Students needing any special consideration or accommodation due to a learning disability should notify the instructor as soon as possible. Students who are facing unusual difficulties may consider contacting the Office for Disability Services, which offers assessment, evaluation and many kinds of help. http://www.bu.edu/disability/services/learning-disabilities/

Class Schedule (Spring 2021)

Date	**Class Content**	**Readings and Papers (due next class)**
Wed Jan 20	Introduction	Read: 1. Poe, "William Wilson" (Blackboard or: http://www.online-literature.com/poe/47/ 2. HM, "The Mirror" (Blackboard)
Fri Jan 22	"William Wilson" & "The Mirror" (presentation on Edgar Allan Poe)	Read: 1.Chandler, *The Long Goodbye* Ch.1-13 (write down an interesting metaphor – or two – to share with the class)
Mon Jan 25	Discussion of Chandler's style (presentation on Raymond Chandler)	Read: HM, *A Wild Sheep Chase* Ch. 1-12
Wed Jan 27	Chandler & Murakami	Read: 1. *The Long Goodbye* Ch.14-26 2. McInerney, "Roll Over, Basho" (Blackboard)
Fri Jan 29	*The Long Goodbye* and *A Wild Sheep Chase* Similar or different?	Read: 1. *A Wild Sheep Chase* Ch.13-24 2. Suter, *The Japanization of Modernity*, pp. 81-96 (Blackboard) Write on Class Blog (1)
TBA	Graduate-student only session (1) Readings to prepare BEFOREHAND: Graham Allen. *Intertextuality*, Ch. 1-3 Mary Orr. Intertextuality: Debates and Contexts, Ch. 4	

Mon Feb 1	Discussion of Suter chapter	Read: HM, *The Long Goodbye* Ch.27-40
Wed Feb 3	Coppola's *Apocalypse Now* & *A Wild Sheep Chase*	Read: HM, *A Wild Sheep Chase* Ch.25-30
Fri Feb 5	Boku vs. Marlowe (Presentation on hardboiled fiction)	Read: 1. *The Long Goodbye* Ch.41-53 2. D. Chandler, "Intertextuality" (link on Blackboard) Write on Class Blog (2)
Mon Feb 8	Discussion of "Intertextuality"	Read: HM, *A Wild Sheep Chase* Ch.31-Epilogue
Wed Feb 10	Boku vs. Humphrey Bogart?	Start reading: J. Conrad, *Heart of Darkness* (link on Blackboard)
Fri Feb 12	No class - *Translation Now* conference at BU To see the program go to: www.bu.edu/wll/translation/translationnow	Finish reading: J. Conrad, *Heart of Darkness* (link on Blackboard) Write on Class Blog (3)
TBA	Graduate-student only session (2) Readings to prepare BEFOREHAND: Cynthia S. Hamilton. *Western and Hard-Boiled Fiction in America*, chs. 6-7 John C. Cawelti, *Adventure, Mystery and Romance*, ch. 6 Stefano Tani, *The Doomed Detective*, chapter on antidetective novels R. Suter, *The Japanization of Modernity*, chs. 3-4	
Mon Feb 15	Presidents' Day – No Class	
Tue Feb 16	MONDAY SCHEDULE Conrad & Murakami (presentation on Joseph Conrad)	Read: (Blackboard) 1. HM, "Where I'm Likely to Find It" 2. HM, "South Bay Strut" 3. Suter, *The Japanization of Modernity*, pp. 97-114 *Optional reading:* 3. HM, "The Last Lawn of the Afternoon
Wed Feb 17	1. Discussion of Suter chapter 2. Discussion of other detective stories in terms of the protagonist.	Read: (Blackboard) 1.HM, "The Year of Spaghetti" 2.Brautigan, "Cooking Spaghetti Dinner in Japan" 3. Rubin, *Haruki Murakami and the Music of Words,* pp. 29-44. **Short paper #1 due Mon, Feb 22**
Fri Feb 19	Visual and other similarities (presentations on Richard Brautigan and Kurt Vonnegut)	Read fragments of the following books on Blackboard 1.HM, *Sputnik Sweetheart* 2. Fitzgerald, *Tender is the Night* 3. HM, *The Wind-Up Bird Chronicle* 4. Irving, *Setting Free the Bears* Write on Class Blog (4)

Mon Feb 22	Borrowed scenes (Presentation on John Irving)	Read: Rubin, *Haruki Murakami and the Music of Words*, "Prelude," pp. 1-7
Wed Feb 24	Role of music in writing and the musicality of "The 1963/1982 Girl from Ipanema"	
Fri Feb 26	Music in Murakami's work	Read: 1. HM, "A Perfect Day for Kangaroos" (Blackboard) 2. J.D. Salinger "A Perfect Day for Bananafish" (link and pdf on Blackboard) Write on Class Blog (5)
TBA	Graduate-student only session (3) Readings to prepare BEFOREHAND: M.Strecher, *The Forbidden Worlds of Haruki Murakami*, chs. 1-3 V. Propp, *Morphology of the Folktale*	TBA
Mon Mar 1	Salinger & Murakami (presentation on J.D. Salinger)	
Wed Mar 3	Greek classics and foreign languages in Murakami	Read: 1. HM, "The Second Bakery Attack" (Blackboard) 2. Carver, "A Small Good Thing" (Blackboard) 3.HM, "The Wind-Up Bird and Tuesday's Women" (Blackboard) 4. Carver, "Are you a doctor?" and "Put Yourself in My Shoes" (Blackboard)
Fri Mar 5	Carver, Murakami and the art of short-story writing (presentation on Raymond Carver)	Read: (Blackboard) 1. HM, "Barn Burning" 2. Carver, "Cathedral" and "Blackbird Pie" 3. Matsuoka, "Haruki Murakami and Raymond Carver: the American Scene"
Mar 6-14	Spring Break – no class	
Mon Mar 15	Discussion of Matsuoka article Carver & Murakami part II	Read: An article on postmodernism – TBA
Wed Mar 17	Discussion on postmodernism Is Murakami a postmodernist?	Read: Iwamoto, "A Voice from Postmodern Japan: Haruki Murakami" (Blackboard)
Fri Mar 19	Is Murakami a postmodernist? Discussion of Iwamoto article	Read: Fragments from: HM, *Kafka on the Shore* and *Hard-Boiled Wonderland and the End of the World* (Blackboard) Write on Class Blog (6)

TBA	Graduate-student only session (4) Readings to prepare BEFOREHAND: L. Mulvey, *Visual and Other Pleasures*, II-7 P. Brooks, *Body Work: Objects of Desire in Modern* Narrative, chs. 2 and 4 P. Waugh, *Metafiction*, chs. 3-4.	
Mon Mar 22	Cinematic inspirations *The 400 Blows* *Magnolia* *Fahrenheit 451*	Read: "Tony Takitani" (Blackboard)
Wed Mar 24	Movie – *Tony Takitani* Room TBA	Read: 1.HM, *Norwegian Wood* ch. 1-5 **Short paper #2 due Mon., Mar 29**
Fri Mar 26	Is Murakami a realist? -- *Norwegian Wood* Presentation on realism	Read: HM, *Norwegian Wood* ch. 6-7 Write on Class Blog (7)
Mon Mar 29	Possible inspirations for *Norwegian Wood*: (presentation on F. Scott Fitzgerald and *The Great Gatsby*	Read: HM, *Norwegian Wood* ch. 8-11
Wed Mar 31	Possible inspirations for *Norwegian Wood*: (presentation on Dickens and *David Copperfield*)	Read: Soseki, fragment of *Kokoro*
Fri Apr 2	*Norwegian Wood* & *Kokoro* (presentation on Soseki and *Kokoro*)	Read: 1.Mohsin Hamid, fragment of *The Reluctant Fundamentalist* 2.Hideo Furukawa, "Slow Boat" 3. Murakami, "Slow Boat to China" (Blackboard) Write on Class Blog (8)
TBA	Graduate-student only session (5) Readings to prepare BEFOREHAND: C.G. Jung, *Aion*, chs. I-IV S. Freud, *The Ego and the Id*, chs. I-III G. Bachelard. *The Poetry of Space*, ch. 1	
Mon Apr 5	Presentation on Mohsin Hamid Presentation on Hideo Furukawa	
Wed Apr 7	Movie, *Norwegian Wood*	
Fri Apr 9	Movie, *Burning*	Read: (Blackboard) 1. W. Gibson, "Johnny Mnemonic," 2. HM, Chapter 3 from *Hard-Boiled Wonderland and the End of the World* Write on Class Blog (9)
Mon Apr 12	Gibson & Murakami Is Murakami a science fiction writer? (presentation on William Gibson)	Read: M. Strecher "Magical Realism and the Search for Identity in Murakami Haruki" (Matthew Strecher)
Wed Apr 14	Is Murakami a magical realist? (presentation on magical realism) Discussion of Strecher's article	Read: 1. H.M. *The Strange Library* 2. H.M. *Pornography as the Winter Museum* (Blackboard)

Fri Apr 16	MONDAY SCHEDULE The meaning of *The Strange Library*	Read: (Blackboard) 1.HM,"Sleep" 2. Chopin, *The Awakening* (fragments) 3. Suter, *The Japanization of Modernity*, pp. 140-162 Write on Class Blog (10)
Mon Apr 19	Patriots's Day – no class	
TBA	Graduate-student only session (2) Readings to prepare BEFOREHAND: R. Suter, *The Japanization of Modernity*, ch. 5	
Wed Apri 21	Murakami writing about women (presentation on Kate Chopin) Discussion of Suter chapter	Read: (Blackboard) 1. HM, "Samsa in Love" 2. Kafka, "Metamorphosis"
Fri Apr 23	Murakami & Kafka (presentation on Franz Kafka)	Read: (Blackboard) 1. Auster, *Ghosts* (fragment on 2. HM, *Colorless Tsukuru Tazaki and His Years of Pilgrimage* (Ch. 1)
Mon Apr 26	Murakami & Auster (presentation on Paul Auster)	Read: 1."A Perfect Day for Kangaroos" in Gabriel's and Goossen's translations 2. "The Wind-Up Bird and Tuesday's women" (tr. A. Birnbaum) and Ch.I from *The Wind-Up Bird Chronicle* (J. Rubin tr.)
Wed Apr 28	Murakami in different translations Final Paper due today at 12 noon. **No exceptions.**	

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: Political Science DATE SUBMITTED: Nov. 1, 2019

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

GRS PO 842

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

CAS/GRS New Course Proposal Form

*To be used only for proposing new CAS courses **without BU Hub credit** as well as for **all** new GRS courses.*

This completed form and all required documents should be submitted as PDF files to either Sr. Academic Administrator Peter Law pgl@bu.edu (for CAS and CAS/GRS "piggyback" courses) or to Graduate Services Associate Casey Dziuba grsgs@bu.edu (for GRS-only courses). Please contact them for information or assistance, if necessary.

DEPARTMENT OR PROGRAM: Political Science DATE SUBMITTED: Nov. 1, 2019

COURSE NUMBER(S) (include college code—CAS or GRS): GRS PO 842

NOTE: A course number cannot be reused if a different course using that number has been offered in the past five years.

COURSE TITLE: Qualitative Approaches to the Study of Political Science

INSTRUCTOR(S): Rosella Cappella Zielinski or Jeremy Menchik

TO BE FIRST OFFERED: Sem./Year: Fall / 2020

SHORT TITLE: The "short title" appears in the course inventory, on the Link University Class Schedule, and on student transcripts and must be 15 characters maximum *including spaces*. It should be as clear as possible.

Q	U	A	L		M	E	T	H	O	D	S			

COURSE DESCRIPTION: This is the description that appears in the CAS and/or GRS Bulletin and The Link. It is the first guide that students have as to what the course is about. The description can contain no more than 40 words.

Introduces the analytical tools and methods that underpin qualitative and multi-method research in the social sciences. Covers conceptualization and measurement, process tracing, comparative historical analysis, archival research, ethics, ethnography and participant observation, interviews, content and discourse analysis, and mixed methods.

PREREQUISITES/COREQUISITES: Indicate "None" or list all elements of the prerequisites/corequisites, clearly indicating "AND" or "OR" where appropriate. Here are three examples: "Junior standing or CAS ZN300 or consent of instructor"; "CAS ZN108 and CAS ZN203 and CAS PQ206; or consent of instructor"; "For SED students only."

1. State the prerequisites and/or corequisites:

Graduate student or consent of instructor.

2. Explain the need for these prerequisites and/or corequisites:

The course is about research methods, so to be relevant for undergraduates, they would need to be advanced undergraduates working on an honors thesis or other independent research.

CREDITS: (check one)

☐ Half course: 2 credits ☐ Variable: Please describe.

X Full course: 4 credits ☐ Other: Please describe.

Provide a rationale for this number of credits, bearing in mind that for a CAS or GRS course to carry 4 credits, 1) it must normally be scheduled to meet at least 150 minutes/week, AND 2) combined instruction and assignments, as detailed in the attached course syllabus, must anticipate at least 12 total hours/week of student effort to achieve course objectives.

The course will meet for at least 150 minutes a week and will require at least 12 hours/week of student effort. It will be similar to all other PO graduate seminars in this respect.

DIVISIONAL STUDIES CREDIT NOTE: *If this course intended to fulfill CAS Divisional Studies requirements, do not use this proposal form.* The course must be proposed through the BU Hub process via CourseLeaf. Refer to http://www.bu.edu/cas/proposing-cas-courses-for-the-bu-hub/ for instructions.

HOW FREQUENTLY WILL THE COURSE BE OFFERED?

☐ Every semester **X** Once a year, fall ☐ Once a year, spring ☐ Every other year

☐ Other: Explain:

NEED FOR THE COURSE: Explain the need for the course *and* its intended impact. How will it strengthen your overall curriculum? Will it be required or fulfill a requirement for degrees/majors/minors offered by your department/program or for degrees in other departments/school/colleges? Which students are most likely to be served by this course? How will it contribute to program learning outcomes for those students? If you see the course as being of "possible" or "likely" interest to students in another departments/program, please consult directly with colleagues in that unit. (You must *attach appropriate cognate comments using cognate comment form* if this course is intended to serve students in specific other programs. See FURTHER INFORMATION below about cognate comment.)

Qualitative and quantitative research methods are both important in political science. For many years, a single graduate course in our department, PO 840: Political Analysis, sought to provide a broad overview of research designs covering both approaches. Over time, as the course has sought to stay up to date with increasingly popular research designs for quantitative causal inference (such as experiments, regression discontinuity designs, and instrumental variables), qualitative methods have been allocated less space in the PO 840 syllabus, yet many of our students continue to use these methods in their research. Our paired proposals aim to split the content previously covered by PO 840 into two new courses, PO 842 and PO 844, with the first focused on qualitative methods and the second on methods for causal inference, so that each gets sufficient attention and depth of coverage. A separate proposal revises our methods requirements for the Ph.D. program such that students must take three 800-level methodology courses out of a current set of four options, to include the new PO 842 and PO 844.

PO 842 is most likely to serve Ph.D. students in Political Science. BA/MA students and undergraduates writing honors theses in Political Science may also occasionally enroll. The course may also be of interest to Ph.D. and MA students in Sociology and to Pardee Master's students, especially given that the course will be taught by a Pardee faculty member, Jeremy Menchik, in alternate years.

ENROLLMENT: How many undergraduate and/or graduate students do you expect to enroll in the initial offering of this course?

Approximately 12 graduate students.

CROSS-LISTING: Is this course to be cross-listed or taught with another course? If so, specify. Chairs/directors of all cross-listing units must co-sign this proposal on the signature line below.

No

OVERLAP: Relationship to other courses in your program or others: Is there any significant overlap between this course and others offered by your department/program or by others? (You must *attach appropriate cognate comments using cognate comment form* if this course might be perceived as overlapping with courses in another department/program. See FURTHER INFORMATION below.)

This course partially overlaps with the existing PO 840, which it (along with PO 844) is intended to replace. There is some potential overlap with GRS SO 712: Qualitative Methods.

FACILITIES AND EQUIPMENT: What, if any, are the new or special facilities or equipment needs of the course (e.g., laboratory, library, instructional technology, consumables)? Are currently available facilities, equipment, and other resources adequate for the proposed course? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

No special needs; current facilities are adequate.

STAFFING: How will the staffing of this course, in terms of faculty and, where relevant, teaching fellows, affect staffing support for other courses? For example, are there other courses that will not be taught as often as now? Is the staffing of this course the result of recent or expected expansion of faculty? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

The course will be taught by existing faculty. Since two faculty plan to alternate teaching it, we do not anticipate significant disruptions to existing course offerings. In the future, if necessary, additional PO faculty or political scientists in Pardee could be incorporated into the rotation.

BUDGET AND COST: What, if any, are the other new budgetary needs or implications related to the start-up or continued offering of this course? If start-up or continuation of the course will entail costs not already discussed, identify them and how you expect to cover them. (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

None

EXTERNAL PROGRAMS: If this course is being offered at an external program/campus, please provide a brief description of that program and attach a CV for the proposed instructor.

N/A

ADDITIONAL DOCUMENTS THAT MUST BE SUBMITTED FOR THIS PROPOSAL TO BE CONSIDERED:

- A complete week-by-week SYLLABUS with student learning objectives, readings, and assignments that reflects the specifications of the course described in this proposal; that is, appropriate level, credits, etc. (See guidelines on "Writing a Syllabus" on the Center for Teaching & Learning website.) A typical, effective syllabus template is provided here under "Curriculum Review & Modification".
- Be sure that syllabus includes your **make-up quiz/exam policy** and expectations for academic honesty, with **URL for pertinent undergraduate or GRS academic conduct code(s).**
- Cognate comment from chairs or directors of relevant departments and/or programs. Use the form here under "Curriculum Review & Modification." You can consult with Dean Joseph Bizup (CAS) at casuap@bu.edu or Dean Emily Barman (GRS) at eabarman@bu.edu to determine which departments or programs inside and outside of CAS/GRS would be appropriate.

DEPARTMENT CONTACT NAME & POSITION: Taylor Boas

DIRECTOR OF GRADUATE STUDIES

DEPARTMENT CONTACT EMAIL & PHONE: TBOAS@BU.EDU; 617-353-4214

Signature(s) required:

DEPARTMENT APPROVAL: _____ 29 Oct 2019

Department Chair — Date

_____ _____

Other Department Chair(s) (required for cross-listed courses) — Date

revised 03/21/2019

Qualitative Graduate Seminar– Fall 2020 Professor Rosella Cappella Zielinski
Course Number: PO842 Boston University

Course Time: TBA Office: Political Science 303
Course Location: TBA Office Hours: TBA
Email: cappella@bu.edu

Qualitative Approaches to the Study of Political Science

Scholarly knowledge advances by academic research. This course introduces graduate students to some of the analytical tools and methods that underpin qualitative and multi-method research in the social sciences. There are various ways political scientists understand and study the world and it is critical for students to be aware of which methods are likely to be appropriate and useful in which circumstances. This course will give students a sense of the rich variety of qualitative research methods available to them and an appreciation of the strengths and weaknesses of each. It will teach students how to formulate a qualitative research project, find and evaluate relevant sources, and analyze those sources as they produce an original research paper. We begin with a discussion of the unique advantages of qualitative methods and historical analysis, especially case studies and process-tracing. Students then learn how to bring out their inner detective by using research libraries, digital archives, interviews, personal papers, oral histories, memoirs, and more.

In addition to understanding the scope of qualitative methods available, the primary goal of the course is application. Throughout the semester students will apply the research design and approaches learned to the research question of their choice. The course will culminate in a qualitative research design paper that demonstrates the student's ability to find new material, use it to change how we think about question in political science, and explain what that means for how we think about the nature of politics.

Note: I encourage students to focus on one research question throughout the semester, ideally one to advance your dissertation or second year paper. You will then design the research exercise, note, and final paper around that question.

Readings:

- Required Books:
  - Andrew Abbott (2004) *Methods of Discovery: Heuristics for the Social Sciences*
  - Alexander George and Andrew Bennett (2005) *Case Studies and Theory Development in Social Sciences*
  - Paul Pierson (2004) *Politics in Time*
  - John Gerring (2017) *Case Study Research: Principles and Practices, 2nd ed.* **On Blackboard**

- Recommended Methods Books
  - Kapiszewski, Diana, Lauren M. MacLean and Benjamin L. Read. *Field Research in Political Science.* New York, NY: Cambridge University Press (2014).
  - Krippendorff, Karl. *Content Analysis: An Introduction to Its Methodology*. Thousand Oaks, CA: Sage (2013).

- Mosley, Layna, ed. *Interview Research in Political Science*. Ithaca, NY: Cornell University Press (2013).
- Rubin, Herbert J. and Irene S. Rubin. *Qualitative Interviewing: The Art of Hearing Data*, 3rd ed. Thousand Oaks, CA: Sage (2012).
- Yanow, Dvora and Peregrine Schwartz-Shea, eds. *Interpretation and Method: Empirical Methods and the Interpretive Turn,* 2nd ed. Armonk, NY: M.E. Sharpe (2014).

- Recommended Writing Books
  - Marc Trachtenberg, *The Craft of International History: A Guide to Method* (Princeton: Princeton University Press, 2006)

The rest of the readings can be accessed through the BU library online, Blackboard or via the websites provided on the syllabus.

Helpful Software:

- Archival research: Camera and extra memory cards, ScannerPro app
  - Document Collections: Optical Character Recognition (OCR) software such as DEVONthink
- Qualitative data analysis: NVivo, Atlas.ti (discourse analysis), Gephi (social network analysis), ArcGIS (qualitative Geographic Information Systems. Software, when necessary, varies by method.

Course Requirements and Grades:

There are **four** requirements for this class:

1. Attendance, Reading, and Active Participation (20%): In addition to doing all the readings and being prepared to discuss them in class, we will be workshopping your colleagues' research design throughout the semester. A key aspect of being a political scientist is being able to help others as conference discussants and participants, article reviewer, and pedagogically in the classroom.

2. Research Exercises (30%): Throughout the semester you will be asked to seven exercises. These exercises are designed to give you practice applying the tools we are discussing each week. Before the start of class, please upload your exercise to Blackboard so everyone has access to it as we will use them for the basis of class discussion. Exercises are not graded, but you must complete the exercises each week in order to get maximum credit for this portion of the final grade. Write-ups of the exercises should generally not require more than 5 double-spaced pages.

3. Research Design Paper (30%): Your research design paper explains your research question, how it relates to theory and why the empirical substance is important. It then provides a qualitative method roadmap for answering your research question including method

employed, sources you plan to use for your research, and how you will use these sources. You will also include a timeline for accessing your sources.

4. Research Design Paper Presentation (20%): In class, you will be given the opportunity to clearly explain your question, why it's important, how the answer relates to theory, the nature of your sources, and future research directions to solve questions you are still not sure about. The grade will also be based on your comments and questions for the presentations of other students. Finally, you will be evaluated partly based on the quality of the presentation itself, including clarity and ability to engage with audience

All assignments are to be original work and include citations to the works consulted or quoted. If there is any question about what that means, the students should refer to the BU website for its discussions of plagiarism or ask in class.

PART I: RESEARCH DESIGN

Week 1 (September 5): Introduction – Ontology versus Epistemology, What is Qualitative Research?, Picking Your Research Question for the Semester

- David Marsh and Paul Furlong (2002) "A Skin, not a Sweater: Ontology vs. Epistemology in Political Science" In: Marsh, David and Stoker, Gerry eds. in *Theory and Methods in Political Science*, Palgrave Macmillan, PP. 17-32
- Abbott, Chapter 1: Explanation, 3- 40, Chapter 2: Basic Debates and Methodological Practices, 41-75.

Week 2 (September 12): Concepts, Indicators, Measures

- Abbott, Chapter 3: Introduction to Heuristics, 80-109.
- Gerring, John. "What Makes a Concept Good? A Criterial Framework for Understanding Concept Formation in the Social Sciences." *Polity* 31:3 (1999), pp. 357-393.
- Sartori, Giovanni. "Concept Misformation in Comparative Politics." *The American Political Science Review* 64:4 (1970), pp. 1033-46 [you can skim the rest].
- Locke, Richard, and Kathleen Thelen. "Apples and Oranges Revisited: Contextualized Comparisons and the Study of Comparative Labor Politics" in *Politics & Society* 23:3 (1995), pp. 337-367.
- Schmidt, Vivien. "Taking Ideas and Discourse Seriously: Explaining Change through Discursive Institutionalism as the Fourth New Institutionalism." *European Political Science Review* vol. 2, no. 1 (2010): 1-25.
- Recommended Reading:
    - Adcock, Robert, and David Collier. "Measurement Validity: A Shared Standard for Qualitative and Quantitative Research." *American Political Science Review* 95:3 (2001), pp. 529-547.
    - *Collier, David, and Steven Levitsky, "Democracy with Adjectives: Conceptual Innovation in Comparative Research," *World Politics* 49:3 (1997), pp. 430-51.

- *"Symposium: Conceptualizing and Measuring Ethnic Identity." Qualitative Methods 7:1 (2009), pp. 29-45.

Exercise 1: Pick a concept that is central to one of your research interests. It could be very abstract (e.g. justice, regime), very concrete (e.g., occupation, campaign advertisement), or something in between (e.g. social cleavage, political socialization, stability). Devise two potential research projects that would involve this concept in some way, *but that would require you to conceptualize, operationalize, and/or measure it differently*. Specify how you would conceptualize, operationalize and measure the concept for *each* research project, and why you would need to do it differently for the two projects.

Week 3 (September 19): Case Studies, Case Selection, and Within Case Variation

- George, Alexander and Andrew Bennett. *Case Studies and Theory Development in the Social Sciences*. Cambridge, MA: MIT Press (2004), Part II: How to Do Case Studies and Chapter 8, PP 65-124 and 151-180
- Gerring, John. *Case Study Research: Principles and Practices.* New York, NY: Cambridge University Press (2017), Chapter 3 ("What is a Case Study Good For?"), Chapter 5 ("Techniques for Choosing Cases").
- Campbell, Donald. "Degrees of Freedom and the Case Study." *Comparative Political Studies* 8 (1975), pp. 178-193.
- Geddes, Barbara. "How the Cases You Choose Affect the Answers You Get: Selection Bias in Comparative Politics." *Political Analysis* 2:1 (1990), pp. 131-50
- Recommended Reading:
    - Slater, Dan and Daniel Ziblatt. "The Enduring Indispensability of the Controlled Comparison." *Comparative Political Studies* 46:10(2013), pp. 1301-1327. [Read first 14 pages; skim the rest.]
    - Tarrow, Sidney. "The Strategy of Paired Comparison: Toward a Theory of Practice." *Comparative Political Studies* 43:2 (2010), pp. 230-259.
    - Simmons, Erica and Nicholas Rush Smith. "The Case for Comparative Ethnography." *Comparative Politics* 51:3 (2019) 341-359.
- Recommended Reading QCA Analysis:
    - Charles C. Ragin, *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. University of Chicago Press, 2008, chapters 1-3. (book to purchase)
    - Charles C. Ragin, "Boolean approach to qualitative comparison." *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. University of California Press, 1987, Chapter 6

Exercise 2: Given your research question, what information would you need to guide your case selection?

Week 4 (September 26): Process Tracing

- Abbott, General Heuristics: Description and Narration, 137-161.

- George, Alexander and Andrew Bennett. *Case Studies and Theory Development in the Social Sciences*. Cambridge, MA: MIT Press (2004), Chapter 10, PP 205-232
- Bennett, Andrew and Jeffrey T. Checkel. "Process Tracing: From Philosophical Roots to Best Practices." Chapter 1 in Andrew Bennett and Jeffrey T. Checkel, eds. *Process Tracing in the Social Sciences: From Metaphor to Analytic Tool* (2013, Cambridge University Press).
- Fairfield, Tasha and Andrew E. Charman. 2017. "Explicit Bayesian Analysis for Process Tracing: Guidelines, Opportunities, and Caveats." *Political Analysis* 25(3): 363-380
- Berger, Thomas U. "From Sword to Chrysanthemum: Japan's Culture of Anti-Militarism." *International Security*, vol. 17, no. 4, 1993, pp. 119–150
- Wilde, Melissa. "How Culture Mattered at Vatican II: Collegiality Trumps Authority in the Council's Social Movement Organizations." *American Sociological Review* 69:4 (2009), pp. 576- 602.
- Recommended Reading:
    - Slater, Dan and Erica Simmons. "Informative Regress: Critical Antecedents in Comparative Politics." *Comparative Political Studies* 43:7 (2010), pp. 886-917.
    - Goertz, Gary and James Mahoney. "A Tale of Two Cultures: Causal Mechanisms and Process Tracing." *Qualitative & Multi-Method Research* 8:2 (2010), pp. 24-30.
    - Fairfield, Tasha and Andrew E. Charman. 2019. "A Dialogue with the Data: The Bayesian Foundations of iterative Research in Qualitative Social Science." *Perspectives on Politics* 17(1): 154-167
    - Fairfield, Tasha. 2013. "Going where the Money Is: Strategies for Taxing Economic Elites in Unequal Democracies." *World Development* 47: 42-57.

Exercise 3: Consider the article by Melissa Wilde or Thomas Berger. What is the process that they traces, and why do they need to trace it? How do they go about "tracing the process:" What argumentative steps does the analysis go through? What kinds of tests do they employ? What techniques did they use to generate the evidence used in the process tracing?

Week 5 (October 3): Comparative Historical Analysis

- Abbott, Fractal Heuristics, 162-210.
- Paul Pierson (2004) *Politics in Time: History, Institutions, and Social Analysis*
- Giovanni Capoccia. And R. Daniel Kelemen (2007) "The Study of Critical Junctures: Theory, Narrative, and Counterfactuals in Historical Institutionalism, *World Politics* 59(3): 341-369
- Neta C Crawford, "The Potential for Fundamental Change in World Politics," *International Studies Review*, Volume 20, Issue 2, June 2018, Pages 232–238.
- Recommended Reading:
    - James Mahoney and Rodrigo Barrenechea, "The Logic of Counterfactual Analysis in Case-Study Explanation," *British Journal of Sociology* 70:1 (2019): 306-338
    - Boas, Taylor. "Conceptualizing Continuity and Change: The Composite-Standard Model of Path Dependence," *Journal of Theoretical Politics* 19 (2007): 33-54

- Hillel David Soifer, "The Causal Logic of Critical Junctures," *Comparative Political Studies* 45 (2012): 1572-1597

Week 6 (October 10): Hermeneutics and Speech Act Theory

- Gibbons, Michael T. 2006. "Hermeneutics, Political Inquiry, and Practical Reason: An Evolving Challenge to Political Science." *American Political Science Review.* 100(4): 563-571.
- Olesen, Jens. 2015. "Hermeneutics." In *Routledge Handbook of Interpretive Political Science*. Ed. Mark Bevir and. R. A. W. Rhodes, Chpater 4.
- Olesen, Jens. 2015. "Towards a Politics of Hermeneutics." In *Interpretation in International Law* ed. Andrea Bianchi, Daniel Peace, and Matthew Windsor. (Oxford: Oxford University Press).
- Balzadcq, Thierry. 2005. "The Three Faces of Securitization: Political Agency, Audience, and Context." *European Journal of International Relations*. 11(2): 171-201.
- Recommended Reading:
  - Dingli, Sophia. 2015. "We need to talk about silence: Re-examinng silence in International Relations Theory." *European Journal of International Relations.* 21(4): 721-742.

PART II: CONDUCTING RESEARCH

Week 7 (October 17): Papers, Document Collections, and Archives

- Vitalis, Robert. "The Past is Another Country." In Ellen Perecman and Sara Curran, eds. *A Handbook for Social Science Field Research: Essays & Bibliographic Sources on Research Design and Methods*. Thousand Oaks, CA: Sage (2006), Chapter 1.
- Lustick, Ian. "History, Historiography, and Political Science: Multiple Historical Records and the Problem of Selection Bias." *American Political Science Review* 90:3 (1996), pp. 605-18.
- Thies, Cameron. "A Pragmatic Guide to Qualitative Historical Analysis in the Study of International Relations." *International Studies Perspectives* 3:4 (2002), pp. 351-372.
- Bercovitch, Jacob. "Social Research and the Study of Mediation: Designing and Implementing Systematic Archival Research." *International Negotiation* 9:3 (2005), pp. 415-428.
- Harrison, Hope. "Inside the SED Archives: A Researcher's Diary." *Cold War International History Project Bulletin* 2 (1992), begins on p. 20. - https://www.wilsoncenter.org/sites/default/files/CWIHPBulletin2.pdf
- Cappella Zielinski, Rosella. *How States Pay for War*. 2016. Chapter 2 "Truman and the Korean War"
- Menchik, Jeremy. "Crafting Indonesian Democracy: Inclusion-Moderation and the Sacralizing of the Postcolonial State," in *Democratic Transition in the Muslim World: A Global Perspective*, Alfred Stepan, ed. (2018, Columbia University Press).
- Recommended Reading:

- Trachtenberg, Marc. *The Craft of International History: A Guide to Method*. Princeton, NJ: Princeton University Press (2006), Chapter 5.
- Sean Kelly and Linda Whitaker, "Hitting the Road Without Hitting the Potholes," in *Doing Archival Research in Political Science*, ed. Scott Frisch et al. (Amherst: Cambria Press, 2002).
- Brandon Rottinghaus, "The Search for the Elusive Executive: Archival Collection Methods and Presidential Libraries," in *Doing Archival Research in Political Science*, ed. Scott Frisch et al. (Amherst: Cambria Press, 2002).

Exercise 4: Given your research question, imagine an archive that you think would help you answer this question, and explain what would be in it and why. Then look for a real archive in the world that comes close to your ideal. Learn as much as you can about the structure of that archive and its rules of operation. Finally, based on this information, say whether this archive would be helpful to you in answering your question.

Week 8 (October 24): Research Ethics and IRB

- Sarah M. Brooks, "The Ethical Treatment of Human Subjects and the Institutional Review Board Process," in *Interview Research in Political Science*, ed. Layna Mosley (Ithaca: Cornell University Press, 2013), 45–66.
- Lee Ann Fujii, "Research Ethics 101: Dilemmas and Responsibilities," *PS: Political Science & Politics* 45, no. 4 (October 2012): 717–23
- Kate Cronin-Furman and Milli Lake, "Ethics Abroad: Fieldwork in Fragile and Violent Contexts," *PS: Political Science & Politics* 51, no. 3 (July 2018): 607–14.
- National Science Foundation. "Interpreting the Common Rule for the Protection of Human Subjects for Behavioral and Social Science Research." (No date). www.nsf.gov/bfa/dias/policy/hsfaqs.jsp

Exercise 5: Imagine three potential dissertation topics that you could imagine doing and that might be ethically problematic. What would make these projects problematic? For which of these would IRB review be required? How could you modify the IRB review process to ensure that the proposed work would be conducted ethically, or not at all?

Week 9 (October 31): Ethnography, Participant Observation, and Overseas Research

- Geertz, C. (1973). Thick Description: Toward an Interpretive Theory of Culture. In *The Interpretation of Cultures: Selected Essays by Clifford Geertz*. Basic Books. Chapter 1, 3-30.
- Geertz, C. (1973). Deep Play: Notes on the Balinese Cockfight. In *The Interpretation of Cultures: Selected Essays by Clifford Geertz*. Basic Books. Chapter 15, 412-453.
- Wedeen, Lisa. "Reflections on Ethnographic Work in Political Science." *Annual Review of Political Science* 13 (2010), pp. 255–272
- Emerson, Robert, Rachel Fretz, and Linda Shaw. *Writing Ethnographic Fieldnotes.* Chicago, IL: University of Chicago Press (1995), Chapter 6. [This is about moving from

ethnographic field notes to writing, but the sample techniques apply to grounded theorizing based on interview transcripts or notes.]

- Daniel P. Aldrich, "The 800-Pound Gaijin in the Room: Strategies and Tactics for Conducting Fieldwork in Japan and Abroad," *PS: Political Science & Politics* 42, no. 2 (April 2009): 299–303.
- Recommended Reading:
    - Kapiszewski, MacLean, and Read, *Field Research in Political Science: Practices and Principles*, 89–99. [For organizing sources]
    - Heyl, B.S. (2001). Ethnographic Interviewing. In Paul Atkinson, Amanda Coffey, Sara Delamont, John Lofland and Lyn Lofland, eds., *Handbook of Ethnography*. Sage, 369-383.
    - Schaffer, F.C. (2016). *Elucidating Social Science Concepts: An Interpretivist Guide*. Routledge.
    - Janet Bujra, "Lost in Translation? The Use of Interpreters in Fieldwork," in *Doing Development Research*, ed. Vandana Desai and Robert B. Potter (London: SAGE Publications, 2006), 172–79.

Week 10 (November 7): Interviews

- Mosley, Layna, ed. *Interview Research in Political Science*. Cornell University Press (2013). Introduction (Mosley), Chapters 1 (Lynch), 2 (Bleich and Pekkanen), 11 (Leech et al).
- Beth Leech, "Asking Questions: Techniques for Semistructured Interviews," *Political Science & Politics* 35, no. 4 (December 2002): 665–68.
- Jeffrey M. Berry, "Validity and Reliability Issues in Elite Interviewing," *Political Science & Politics* 35, no. 4 (December 2002): 697–682.
- Soss, Joe. "Talking Our Way to Meaningful Explanations: A Practice-Centered View of Interviewing for Interpretive Research." Chapter 8 in Dvora Yanow and Peregrine Schwartz- Shea, eds. *Interpretation and Method: Empirical Research Methods and the Interpretive Turn*, 2nd ed. Armonk, NY: M.E. Sharpe (2014), pp.161-182.
- Menchik, Jeremy, 2014. "Productive Intolerance: Godly Nationalism in Indonesia," *Comparative Studies in Society and History* 56(3): 591-621.
- Recommended Reading:
    - Matthew N. Beckmann and Richard L. Hall, "Elite Interviewing in Washington, DC," in *Interview Research in Political Science*, ed. Layna Mosley (Ithaca: Cornell University Press, 2013), 196–208.

Exercise 6: Think of a question – ANY question - to which you would like to know the answer. Then write several interview questions that would help you elicit the information you need to answer the question. Find a few examples of the types of people you would need to interview, and ASK THE QUESTIONS. (Don't worry about representative sampling.) Which questions elicited the most useful information? Why? How did you feel while you were asking the questions? How did your respondents seem to feel when they were answering them?

Week 11 (November 14): Content and Discourse Analysis; Digital Databases

- Krippendorff, Karl, *Content Analysis: An Introduction to Its Methodology*. Thousand Oaks, CA: Sage (2013 – but earlier editions are also fine). [You can skim the earlier theory chapters, focus on the how-to aspects.]
- Herrera, Yoshiko, Bear Braumoeller et al. "Symposium: Discourse/Content Analysis." *Qualitative Methods* 2:1 (2004). Contributions by Hardy et al., Crawford, Laffey and Weldes, Hopf, Neuendorf.
- Lara Putnam, "The Transnational and the Text-Searchable: Digitized Sources and the Shadows They Cast," *The American Historical Review* 121, no. 2 (April 2016): 377–402.
- Martin, Cathie Jo. (2018). Imagine All the People: Literature, Society, and Cross-National Variation in Education Systems. *World Politics, 70*(3), 398-442.
- Recommended Reading:
    - Grimmer, J., & Stewart, B. M. (2013). Text as data: The promise and pitfalls of automatic content analysis methods for political texts. *Political analysis*, 267-297
    - Caliskan, A., Bryson, J. J., & Narayanan, A. (2017). Semantics derived automatically from language corpora contain human-like biases. *Science, 356*(6334), 183-186

Exercise 7: Think of a question that you would like to answer using content analysis of materials that can be accessed easily (i.e. no web scraping) on the web sites of one or more academic journals. Write a sampling procedure and codebook that could be used by a partner in class to conduct a miniature content analysis to answer this question.

-

Week 12 (November 21): Mixed Methods and Presentations

- Seawright, Jason. (2016) Better Multimethod Design: The Promise of Integrative Multimethod Research *Security Studies* 25(1): 42-49
- Goertz, G. (2016). Multimethod Research. *Security Studies*, 25:1, 3-24
- Evan Lieberman, "Nested Analysis as a Mixed-Method Strategy for Comparative Research." American Political Science Review 99, 3 (August 2005)

Week 13 (November 28) – Thanksgiving

Week 5 (December 5) – Publishing and Presentations

- Isaac, Jeffrey C. "From the Editor: For a More Public Political Science," *Perspectives in Politics*, 13:2 (2015): 269- 283
- Charles M. Bonjean and Jan Hullum. 1978. "Reasons for Journal Rejection: An Analysis of 600 Manuscripts." *PS: Political Science and Politics.* 480-483
- Alexander L. George and Andrew Bennett. 2005. *Case Studies and Theory Development in the Social Sciences.* Cambridge, MA: MIT Press. 109-124, 263-285.

Howard Wainer. "How to Display Data Badly." *The American Statistician*, Vol. 38, No. 2 (May 1984). 137-147.

Boston University College and Graduate School of Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

Date: October 27, 2019

Cognate Comment Request

TO: Name: William Grimes

Department: Pardee School

FROM: Name: Taylor Boas

Department: Political Science

Telephone: 617-353-4214 E-mail tboas@bu.edu

Course Number: GRS PO 842

Course or Program Title: Qualitative Approaches to the Study of Political Science

Our Department/Program would like to request cognate comments on this course (or program). A complete proposal is attached for your review. If you need further information, please do not hesitate to contact me.

Kindly return the signed original to me by Nov. 1, 2019 so that I may include your comments when submitting our proposal for review and approval. Please do not send any cognate letters directly to the address above. Thank you.

COMMENTS: The Pardee School is happy to support this proposed course. It will contribute to the quality of PhD training in Political Science. We also anticipate that some Pardee School students will take advantage of the course to develop skills that will be useful both in their MA Papers and in career options including diplomacy, journalism, thinktanks, and advocacy.

Please explain fully any objections.

Signature: Date: 10/28/19

Title: Associate Dean for Academic Affairs

Boston University College and Graduate School of Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

Date: October 31, 2019

Cognate Comment Request

TO: Name: Deborah Carr / Ashley Mears

Department: Sociology

FROM: Name: Taylor Boas

Department: Political Science

Telephone: 617-353-4214 E-mail tboas@bu.edu

Course Number: GRS PO 842

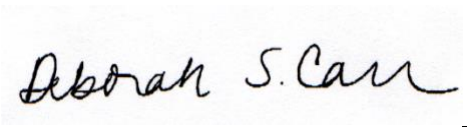
Course or Program Title: Qualitative Approaches to the Study of Political Science

Our Department/Program would like to request cognate comments on this course (or program). A complete proposal is attached for your review. If you need further information, please do not hesitate to contact me.

Kindly return the signed original to me by Nov. 1, 2019 so that I may include your comments when submitting our proposal for review and approval. Please do not send any cognate letters directly to the address above. Thank you.

COMMENTS: This is an excellent course that provides an essential background and hands-on-training in qualitative methods in political science. The course clearly meets the needs of students in political science, and may well attract students from other disciplines/units including Sociology, Pardee, or Questrom. The content and design share similarities to SO 712 Qualitative Research Methods Graduate Seminar, yet also includes topics and readings that are distinct to the field of Political Science. Importantly, the courses will be offered in different semesters with PO 842 offered in the Fall and SO 712 (taught by Japonica Brown-Saracino) offered in the Spring. We are happy to offer our strongest endorsement if this proposed course.

Please explain fully any objections.

Signature:  Date: 10/31/19

Title: Professor and Chair

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: Political Science DATE SUBMITTED: Nov. 1, 2019

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

GRS PO 844

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

CAS/GRS New Course Proposal Form

*To be used only for proposing new CAS courses **without BU Hub credit** as well as for **all** new GRS courses.*

This completed form and all required documents should be submitted as PDF files to either Sr. Academic Administrator Peter Law pgl@bu.edu (for CAS and CAS/GRS "piggyback" courses) or to Graduate Services Associate Casey Dziuba grsgs@bu.edu (for GRS-only courses). Please contact them for information or assistance, if necessary.

DEPARTMENT OR PROGRAM: Political Science DATE SUBMITTED: Nov. 1, 2019

COURSE NUMBER(S) (include college code—CAS or GRS): GRS PO 844

NOTE: A course number cannot be reused if a different course using that number has been offered in the past five years.

COURSE TITLE: Methods for Causal Inference

INSTRUCTOR(S): Steven Rosenzweig

TO BE FIRST OFFERED: Sem./Year: Spring / 2021

SHORT TITLE: The "short title" appears in the course inventory, on the Link University Class Schedule, and on student transcripts and must be 15 characters maximum *including spaces*. It should be as clear as possible.

C	A	U	S	A	L		I	N	F	E	R	E	N	C

COURSE DESCRIPTION: This is the description that appears in the CAS and/or GRS Bulletin and The Link. It is the first guide that students have as to what the course is about. The description can contain no more than 40 words.

Research methods for causal inference in political science. Randomized experiments (lab, survey, and field), natural experiments (including regression discontinuity and instrumental variable designs), difference-in-differences and fixed effects models, multiple regression and matching, comparative case studies, process tracing, and multi-method designs.

PREREQUISITES/COREQUISITES: Indicate "None" or list all elements of the prerequisites/corequisites, clearly indicating "AND" or "OR" where appropriate. Here are three examples: "Junior standing or CAS ZN300 or consent of instructor"; "CAS ZN108 and CAS ZN203 and CAS PQ206; or consent of instructor"; "For SED students only."

1. State the prerequisites and/or corequisites:

GRS PO 841 or consent of instructor.

2. Explain the need for these prerequisites and/or corequisites:

Students would benefit from already having basic knowledge of linear regression and statistics learned in PO 841, but other coursework might suffice to meet this requirement, thus the possibility of registering with the consent of the instructor. The course is about research methods, so to be relevant for undergraduates, they should either be in the BA/MA program (and might therefore have taken PO 841), or they would need to be

advanced undergraduates working on an honors thesis or other independent research (for which the instructor would grant them consent).

CREDITS: (check one)

☐ Half course: 2 credits ☐ Variable: Please describe.

X Full course: 4 credits ☐ Other: Please describe.

Provide a rationale for this number of credits, bearing in mind that for a CAS or GRS course to carry 4 credits, 1) it must normally be scheduled to meet at least 150 minutes/week, AND 2) combined instruction and assignments, as detailed in the attached course syllabus, must anticipate at least 12 total hours/week of student effort to achieve course objectives.

The course will meet for at least 150 minutes a week and will require at least 12 hours/week of student effort. It will be similar to all other PO graduate seminars in this respect.

DIVISIONAL STUDIES CREDIT NOTE: *If this course intended to fulfill CAS Divisional Studies requirements, do not use this proposal form.* The course must be proposed through the BU Hub process via CourseLeaf. Refer to http://www.bu.edu/cas/proposing-cas-courses-for-the-bu-hub/ for instructions.

HOW FREQUENTLY WILL THE COURSE BE OFFERED?

☐ Every semester ☐ Once a year, fall **X** Once a year, spring ☐ Every other year

☐ Other: Explain:

NEED FOR THE COURSE: Explain the need for the course *and* its intended impact. How will it strengthen your overall curriculum? Will it be required or fulfill a requirement for degrees/majors/minors offered by your department/program or for degrees in other departments/school/colleges? Which students are most likely to be served by this course? How will it contribute to program learning outcomes for those students? If you see the course as being of "possible" or "likely" interest to students in another departments/program, please consult directly with colleagues in that unit. (You must *attach appropriate cognate comments using cognate comment form* if this course is intended to serve students in specific other programs. See FURTHER INFORMATION below about cognate comment.)

Qualitative and quantitative research methods are both important in political science. For many years, a single graduate course in our department, PO 840: Political Analysis, sought to provide a broad overview of research designs covering both approaches. Over time, as the course has sought to stay up to date with increasingly popular research designs for quantitative causal inference (such as experiments, regression discontinuity designs, and instrumental variables), qualitative methods have been allocated less space in the PO 840 syllabus, yet many of our students continue to use these methods in their research. Our paired proposals aim to split the content previously covered by PO 840 into two new courses, PO 842 and PO 844, with the first focused on qualitative methods and the second on methods for causal inference, so that each gets sufficient attention and depth of coverage. A separate proposal revises our methods requirements for the Ph.D. program such that students must take three 800-level methodology courses out of a current set of four options, to include the new PO 842 and PO 844.

PO 844 is most likely to serve Ph.D. students in Political Science. BA/MA students and undergraduates writing honors theses in Political Science may also occasionally enroll.

ENROLLMENT: How many undergraduate and/or graduate students do you expect to enroll in the initial offering of this course?

Approximately 8 graduate students.

CROSS-LISTING: Is this course to be cross-listed or taught with another course? If so, specify. Chairs/directors of all cross-listing units must co-sign this proposal on the signature line below.

No

OVERLAP: Relationship to other courses in your program or others: Is there any significant overlap between this course and others offered by your department/program or by others? (You must *attach appropriate cognate comments using cognate comment form* if this course might be perceived as overlapping with courses in another department/program. See FURTHER INFORMATION below.)

This course partially overlaps with the existing PO 840, which it (along with PO 842) is intended to replace. There is also some overlap with QST DS 925: Methods for Causal Inference in Strategy Research and CAS MA 592: Introduction to Causal Inference, which some of our students have taken or are currently taking. Both of the latter courses deal more with the statistical theory and computing applications of methods for causal inference, and they include problem sets and data analysis, whereas PO 840 is a readings and discussion course with strictly written assignments. The disciplinary focus of examples and readings in each course also differs. Hence, there is less overlap in practice than one might assume from course titles, and we still plan to recommend QST DS 925 and CAS MA 592 for students who desire advanced training in applied causal inference methods.

FACILITIES AND EQUIPMENT: What, if any, are the new or special facilities or equipment needs of the course (e.g., laboratory, library, instructional technology, consumables)? Are currently available facilities, equipment, and other resources adequate for the proposed course? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

No special needs; current facilities are adequate.

STAFFING: How will the staffing of this course, in terms of faculty and, where relevant, teaching fellows, affect staffing support for other courses? For example, are there other courses that will not be taught as often as now? Is the staffing of this course the result of recent or expected expansion of faculty? (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

The course will be taught by existing faculty. In addition to the proposed instructor, Steven Rosenzweig, we have numerous other faculty who would be qualified to teach it.

BUDGET AND COST: What, if any, are the other new budgetary needs or implications related to the start-up or continued offering of this course? If start-up or continuation of the course will entail costs not already discussed, identify them and how you expect to cover them. (NOTE: Approval of proposed course does *not* imply commitment to new resources to support the course on the part of CAS.)

None

EXTERNAL PROGRAMS: If this course is being offered at an external program/campus, please provide a brief description of that program and attach a CV for the proposed instructor.

N/A

ADDITIONAL DOCUMENTS THAT MUST BE SUBMITTED FOR THIS PROPOSAL TO BE CONSIDERED:

- A complete week-by-week SYLLABUS with student learning objectives, readings, and assignments that reflects the specifications of the course described in this proposal; that is, appropriate level, credits, etc. (See guidelines on "Writing a Syllabus" on the Center for Teaching & Learning website.) A typical, effective syllabus template is provided here under "Curriculum Review & Modification".
- Be sure that syllabus includes your **make-up quiz/exam policy** and expectations for academic honesty, with **URL for pertinent undergraduate or GRS academic conduct code(s).**
- Cognate comment from chairs or directors of relevant departments and/or programs. Use the form here under "Curriculum Review & Modification." You can consult with Dean Joseph Bizup (CAS) at casuap@bu.edu or Dean Emily Barman (GRS) at eabarman@bu.edu to determine which departments or programs inside and outside of CAS/GRS would be appropriate.

DEPARTMENT CONTACT NAME & POSITION: Taylor Boas
DIRECTOR OF GRADUATE STUDIES

DEPARTMENT CONTACT EMAIL & PHONE: TBOAS@BU.EDU; 617-353-4214

Signature(s) required:

DEPARTMENT APPROVAL: _____ 29 Oct 2019
Department Chair — Date

_____ _____
Other Department Chair(s) (required for cross-listed courses) — Date

revised 03/21/2019

PO 844: Methods for Causal Inference

Spring 2021

Instructor: Steven Rosenzweig
scrosen@bu.edu

This course is a survey of research methods for causal inference in political science (and social science more broadly). It covers both experimental and observational, qualitative and quantitative research (with less focus on the former due to in-depth coverage in PO 84X), and it gives students an opportunity to put lessons into practice by developing their own research designs. Methods and research designs we cover include randomized experiments (lab, survey, and field), natural experiments (including regression discontinuity and instrumental variable designs), difference-in-differences and fixed effects models, multiple regression and matching, comparative case study research, process tracing, and multi-method designs. Class readings include explanations and analyses of particular methods or designs, as well as exemplary or teachable examples of the methods and designs that we cover. Reading both is essential to getting the most out of this course.

The class focuses primarily on principles of research design rather than the practical aspects of implementing one's research plan, such as how to collect data. We therefore skip—or only briefly touch on—the *how to* of conducting field work, designing surveys, working in archives, collecting administrative data, creating/merging new datasets, etc. These are important skills that I hope you will acquire from your advisors, your own reading, and from practice (and that I'm happy to advise on as well when helpful).

Course Materials

Course materials include *Field Experiments: Design, Analysis, and Interpretation* by Gerber and Green, *Natural Experiments in the Social Sciences: A Design-Based Approach* by Thad Dunning, and *The Paradox of Chiefs in Democratic Africa* by Kate Baldwin. I also recommend that you purchase *Mostly Harmless Econometrics: An Empiricist's Companion* by Joshua D. Angrist and Jörn-Steffen Pischke, though this is not required (I will post copies of the chapters you are required to read). All other materials are accessible online when you are connected to the BU network or VPN (searching via Google Scholar is recommended), or posted to the course Blackboard site. Please get in touch with me *well in advance* if you have problems accessing any of the materials.

Assignments

All assignments are due at midnight on their due date. Late work will be docked one partial grade (e.g. B+ to B) for each day that it is late. Please see the Boston University Academic Code of Conduct for your rights and responsibilities as BU students, and for policies guiding suspected plagiarism and other forms of academic misconduct.

Mini Peer Review Memos (30%): You will write two mock ($\approx$ 2 single-spaced pages) peer review memos in which you analyze one of the assigned study's strengths and weaknesses, with a focus on the strength of its causal identification strategy. The first memo should be completed by **xx**, and the second by **xx**.

Research Design/Pre-Analysis Plan (60%): This is the principal assignment of the class, and is your opportunity to put what you've learned into practice, as well to design a study that may be pursued as part of a dissertation or stand-alone research project. A draft research design is due on **xx**, with the final draft due on **xx**.

Class Participation (10%): This is a seminar-style class, and participation is essential. The *quality* of your contributions will be considered just as important as the quantity.

Class Topics and Readings

Introduction to causal inference

Week 1: Causal inference in social science research

Samii, Cyrus. 2016. "Causal Empiricism in Quantitative Research." *The Journal of Politics* 78(3): 941–55.

Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton, NJ: Princeton University Press. Chapter 1.

Holland, Paul. W. 1986. "Statistics and Causal Inference." *Journal of the American Statistical Association* 81(396): 945–960.

Keele, Luke. 2015. "The Statistics of Causal Inference: A View from Political Methodology. Political Analysis" 23(3): 313–335.

Week 2: Causal mechanisms

Gerring, John. 2010. "Causal Mechanisms: Yes, But..." *Comparative Political Studies* 43(11): 1499–1526.

Green, Donald P., Shang E. Ha, and John G. Bullock. 2010. "Enough Already about 'Black Box' Experiments: Studying Mediation Is More Difficult than Most Scholars Suppose." *Annals of the American Academy of Political and Social Science* 628(1): 200–208.

Imai, Kosuke., Luke Keele., Dustin Tingley and Teppei Yamamoto. 2011. "Unpacking the Black Box of Causality: Learning about Causal Mechanisms from Experimental and Observational Studies. American Political Science Review" 105(4): 765–789.

Experimental methods

Week 3: Introduction to experimental methods

Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton, NJ: Princeton University Press. Chapter 1, pp. 11-22.

Gerber, Alan S. and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation.* New York: Norton, W. W. & Company, Inc. Chapters 1-2.

Iyenger, Shanto, 2011. "Laboratory Experiments in Political Science." In Druckman, James N., Donald P. Green, James H. Kuklinski, and Arthur Lupia, eds. *Cambridge Handbook of Experimental Political Science.* Cambridge and New York: Cambridge University Press.

Sniderman, Paul M, 2011. "The Logic and Design of the Survey Experiment." In Druckman, James N., Donald P. Green, James H. Kuklinski, and Arthur Lupia, eds. *Cambridge Handbook of Experimental Political Science.* Cambridge and New York: Cambridge University Press.

Week 4: Designing and analyzing experiments

Gerber, Alan S. and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation.* New York: Norton, W. W. & Company, Inc. Chapters 3-9.

Week 5: Lab, survey, and field experiments

Habyarimana, James, Macartan Humphreys, Daniel N. Posner, and Jeremy M. Weinstein. 2007. "Why Does Ethnic Diversity Undermine Public Goods Provision?" *American Political Science Review* 101(4): 709–25.

Klar, Samara. 2013. "The Influence of Competing Identity Primes on Political Preferences." *Journal of Politics* 75(4): 1108-1124.

Asunka, Joseph et al. 2017. "Electoral Fraud or Violence: The Effect of Observers on Party Manipulation Strategies." *British Journal of Political Science*: 1–23.

Blair, Robert A, Sabrina M. Karim, and Benjamin S. Morse. Forthcoming. "Establishing the Rule of Law in Weak and War-Torn States: Evidence from a Field Experiment with the Liberian National Police." *American Political Science Review.*

Observational Approaches to Causal Inference

Week 6: Natural experiments

Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge: Cambridge University Press. Chapters 1-4 and 8-10.

Week 7: Natural experimental designs: Regression discontinuities, instrumental variables, and "true" natural experiments

Chattopadhyay, Raghabendra, and Esther Duflo. 2004. "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India." *Econometrica* 72(5): 1409–43.

Carnegie, Allison and Nikolay Marinov. 2017. "Foreign Aid, Human Rights, and Democracy Promotion: Evidence from a Natural Experiment." *American Journal of Political Science* 61(3): 671-683.

Fujiwara, Thomas. 2015. "Voting Technology, Political Responsiveness, and Infant Health: Evidence From Brazil." *Econometrica* 83(2): 423–64.

Week 8: Levering variation over time: Difference-in-differences and fixed effects

Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, NJ: Princeton University Press. Chapter 5.

Liu, Shelley. 2017. Wartime Educational Loss and Attitudes Toward Democratic Institutions. Afrobarometer Working Paper No. 175.

Teele, Dawn Langan. 2018. "How the West Was Won: Competition, Mobilization, and Women's Enfranchisement in the United States." *Journal of Politics* 80(2): 442-461.

Enos, Ryan D., Aaron R. Kaufman, and Melissa L. Sands. 2019. "Can Violent Protest Change Local Policy Support? Evidence from the Aftermath of the 1992 Los Angeles Riot." *Journal of Politics*.

Week 9: Conditioning on observables: Multiple regression and matching

Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, NJ: Princeton University Press. Chapter 3.

Aronow, Peter M., and Cyrus Samii. 2016. "Does Regression Produce Representative Estimates of Causal Effects?" *American Journal of Political Science* 60(1): 250–67.

Sekhon, Jasjeet S. 2009. "Opiates for the Matches: Matching Methods for Causal Inference." *Annual Review of Political Science* 12(1): 487–508.

Ross, Michael L. 2001. "Does Oil Hinder Democracy?" *World Politics* 53(3): 325–61.

Ichino, Nahomi, and Noah L. Nathan. 2013. "Do Primaries Improve Electoral Performance? Clientelism and Intra-Party Conflict in Ghana." *American Journal of Political Science* 57(2): 428–41.

Week 10: Comparative case study research

Gerring, John. 2004. "What Is a Case Study and What Is It Good For?" *American Political Science Review* 98(2): 341–54.

Mahoney, James. 2003. "Strategies of Causal Assessment in Comparative Historical Analysis," in *Comparative Historical Analysis in the Social Sciences*. Cambridge: Cambridge University Press.

Skocpol, Theda. 1979. *States and Social Revolutions: A Comparative Analysis of France, Russia, and China*. Cambridge: Cambridge University Press. Chapter 3.

Thelen, Kathleen. 2014. *Varieties of Liberalization and the New Politics of Social Solidarity*. New York: Cambridge University Press. Chapter 2.

Week 11: Process tracing

Collier, David. 2011. "Understanding Process Tracing." *PS: Political Science and Politics* 44(4): 823–30.

Bennett, Andrew and Jeffrey T. Checkel. 2015. "Process Tracing: From Philosophical Roots to Best Practices." In Bennett, Andrew and Jeffrey T. Checkel, eds. *Process Tracing: From Metaphor to Analytic Tool*. Cambridge: Cambridge University Press.

Tannenwald, Nina. 1999. "The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use." *International Organization* 53(3): 433-468.

Teele, Dawn Langan. 2014. "Ordinary Democratization: The Electoral Strategy That Won British Women the Vote." *Politics & Society* 42(4): 537-561.

Multi-Method Research

Week 12: Mixed methods: Why and how

Tarrow, Sidney. 1995. "Bridging the Quantitative-Qualitative Divide in Political Science." *American Political Science Review* 89(2): 471–74.

Coppedge, Michael. 1999. "Thickening Thin Concepts and Theories: Combining Large N and Small in Comparative Politics." *Comparative Politics* 31(4): 465–76.

Dunning, Thad. 2012. *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge: Cambridge University Press. Chapters 7 and 11.

Week 13: Multi-method designs

Baldwin, Kate. 2016. *The Paradox of Chiefs in Democratic Africa*. New York: Cambridge University Press.

Boston University College and Graduate School of Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

Date: October 27, 2019

Cognate Comment Request

TO: Name: Timothy Simcoe

Department: Questrom

FROM: Name: Taylor Boas

Department: Political Science

Telephone: 617-353-4214 E-mail tboas@bu.edu

Course Number: GRS PO 844

Course or Program Title: Methods for Causal Inference

Our Department/Program would like to request cognate comments on this course (or program). A complete proposal is attached for your review. If you need further information, please do not hesitate to contact me.

Kindly return the signed original to me by Nov. 1, 2019 so that I may include your comments when submitting our proposal for review and approval. Please do not send any cognate letters directly to the address above. Thank you.

COMMENTS: I have no objections to the proposed class PO84X. Questrom DS925 covers the material on weeks 7 through 9 of the proposed syllabus in much greater depth. In particular, DS925 devotes 2-3 class sessions to matching, instruments, regression discontinuity and difference-in-differences, with problem sets on each of those topics and a strong emphasis on identifying and seeking to falsify maintained assumptions that are necessary conditions for causal inference.

In some ways, this class is closer to Questrom DS906 “Fundamentals of Research and the Philosophies of Science” which provides a survey of research methodologies and their epistemological foundations. It seems appropriate, however, for different schools and departments to provide such an introductory class to their own students, given the heterogeneous approaches towards research methodology across social science disciplines.

Please explain fully any objections.

Signature: Sim Simcoe Date: October 28, 2019

Title: Associate Professor, PhD Program Director

BOSTON UNIVERSITY

Boston University College and Graduate School of Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

Date: October 27, 2019

Cognate Comment Request

TO: Name: David Rohrlich / Ashis Gangopadhyay / Takashi Kimura

Department: Mathematics and Statistics

FROM: Name: Taylor Boas

Department: Political Science

Telephone: 617-353-4214 E-mail tboas@bu.edu

Course Number: GRS PO 844

Course or Program Title: Methods for Causal Inference

Our Department/Program would like to request cognate comments on this course (or program). A complete proposal is attached for your review. If you need further information, please do not hesitate to contact me.

Kindly return the signed original to me by Nov. 1, 2019 so that I may include your comments when submitting our proposal for review and approval. Please do not send any cognate letters directly to the address above. Thank you.

COMMENTS: We have no objection to PO 844. In fact we think that PO 844 may lead to further interest in MA 592. While there is some overlap between the two courses (instrumental variables, conditioning on base line covariates, mediation) the overlap is fairly small, and the perspective of the two courses is quite different.

Please explain fully any objections.

Signature: David Rohrlich Date: 10/29/2019

Title: Chair, Dept. of Math. & Stats.

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: **Astronomy** DATE SUBMITTED: **2019/10/08**

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED:

GRS AS 706 "Radiative Processes and Spectroscopy"

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

CAS/GRS Course Revision Proposal Form

*To be used only for proposing a revision of a CAS course **without BU Hub credit** as well as for **all** GRS courses.*

This completed form and all required documents should be submitted as PDF files to either Sr. Academic Administrator Peter Law pgl@bu.edu (for CAS and CAS/GRS "piggyback" courses) or to Graduate Services Associate Casey Dziuba grsgs@bu.edu (for GRS-only courses). Please contact them for information or assistance, if necessary.

DEPARTMENT OR PROGRAM: **Astronomy** DATE SUBMITTED: **2019/09/20**

CURRENT COURSE NUMBER (include college code—CAS or GRS): **GRS AS 712**

CURRENT COURSE NAME: **Radiative Processes in Astrophysics**

CURRENT 40 WORD COURSE DESCRIPTION: **Generation, propagation, and transfer of electromagnetic radiation. Spectral energy distributions, continuum radiation, spectral lines. Interaction of radiation with matter, transfer of radiation through astrophysical media. Thermal and nonthermal radiative processes**.

CURRENT CROSS-LISTING DEPARTMENT/PROGRAM, if any: **none**

TO BE OFFERED NEXT: Sem./Year: **Spring / 2021**

INSTRUCTOR(S): **Marscher, Muirhead**

ITEMS PROPOSED FOR REVISION (check all that apply)**:**

√ Course Number	☐ Credits	☐ Corequisites
√ Title	**√ 40 Word Description**	☐ Other (Explain)
√ Short Title	☐ Prerequisites	

PROPOSED REVISIONS: For each item checked above, provide the *current information*, then the *proposed information*, then a *brief explanation for the proposed change, including the intended impact of the change.*

1. Course Number

   a. Current information: **GRS AS 712 (plus parts of AS 713)**

   b. Proposed information: **GRS AS 706**

   c. Explanation & impact: **As a component of the proposed revision to our PhD program in Astronomy, the old GRS AS 712 will subsume some of the content of the old GRS AS 713 (Astronomical Spectroscopy) to become GRS AS 706. Both GRS AS 712 and GRS AS 713 will be discontinued.**

2. Title

   a. Current information: **Radiative Processes in Astrophysics**

b. Proposed information: **Radiative Processes and Spectroscopy**

c. Explanation & impact: **New title will convey the new course content**

3. Short Title

a. Current information: **Radiative Proc**

b. Proposed information: **Radiative Spec**

c. Explanation & impact: **New short title will convey the new course content**

4. 40-word Description

a. Current information: **Generation, propagation, and transfer of electromagnetic radiation. Spectral energy distributions, continuum radiation, spectral lines. Interaction of radiation with matter, transfer of radiation through astrophysical media. Thermal and nonthermal radiative processes**

b. Proposed information:

c. Explanation & impact: **conveys new course content**

IMPACT ON OTHER DEPARTMENTS/PROGRAMS: Will any of these changes have an impact on students pursuing the degree requirements or expectations of other departments, programs, or schools?
Check one: ☐ Yes **X** No

If YES, please identify impacts and attach cognate comment from the appropriate department/ program/ school.

RESOURCE NEEDS: STAFFING, FACILITIES, AND EQUIPMENT: As a result of the proposed changes, will there be any changes in the staffing, special facilities or equipment needs of the course (e.g. laboratory, library, instructional technology, technical resources, etc)?
Check one: ☐ Yes **X** No

If YES, explain further and indicate whether currently available staffing, facilities, and equipment are adequate for the proposed course. (NOTE: Approval of proposed revisions does *not* imply a change in resource commitments on the part of CAS.)

ADDITIONAL DOCUMENTS THAT MUST BE SUBMITTED IN ORDER FOR THIS PROPOSAL TO BE CONSIDERED:

- A complete week-by-week SYLLABUS with student learning objectives, readings, and assignments that reflects the specifications of the course described in this proposal; that is, appropriate level, credits, etc. (See guidelines on "Writing a Syllabus" on the Center for Teaching & Learning website.) A typical, effective syllabus template is provided here under "Curriculum Review & Modification".

- Be sure that syllabus includes your **make-up quiz/exam policy** and expectations for academic honesty, with **URL for pertinent undergraduate or GRS academic conduct code(s).**
- Cognate comment from chairs or directors of relevant departments and/or programs. Use the form here under "Curriculum Review & Modification." You can consult with Dean Joseph Bizup (CAS) at casuap@bu.edu or Dean Emily Barman (GRS) at eabarman@bu.edu to determine which departments or programs inside and outside of CAS/GRS would be appropriate.

DEPARTMENT CONTACT NAME & POSITION: **Dan Clemens, Chair**

DEPARTMENT CONTACT EMAIL & PHONE: **CLEMENS@BU.EDU; 3-6140**

Signature(s) required:

DEPARTMENT APPROVAL: _____ **2019/10/08**

Department Chair Date

_____ _____

Other Department Chair(s) (required for cross-listed courses) Date

revised 03/21/2019

AS706: Radiative Processes and Spectroscopy

Catalog Copy: "Generation, propagation, and transfer of electromagnetic radiation. Spectral energy distributions, continuum radiation, atomic and molecular spectral lines. Energy levels in atoms and molecules. Interaction of radiation with matter, transfer of radiation through astrophysical media. Thermal and nonthermal radiative processes."

Course Description:

The primary way that we explore the universe beyond the Solar System is by the electromagnetic radiation that cosmic objects emit and, in some case, absorb. This course describes the theory of the physical processes that lead to the emission and absorption of electromagnetic waves. These processes are primarily the motions of charged particles in plasmas. For some radiation mechanisms, the motions are non-relativistic, while in others the velocities are very close to the speed of light. A list of topics is given along with the course plan at the end of this document.

The pre-requisite educational background required for the course is a basic grounding in undergraduate physics – especially quantum mechanics plus electricity and magnetism – and calculus. The course will emphasize development of critical thinking skills needed in analysis and physical understanding of the electromagnetic signals received from cosmic objects.

The primary textbook for the course is *Radiative Processes in Astrophysics* by Rybicki & Lightman. The book is out of print, although it is possible to find some hard copies via internet sellers. A publicly available PDF file of the book is posted on the course website. A secondary textbook, also available in PDF format on the course website, is *Radiative Processes in High Energy Astrophysics* by Ghisellini.

Exams, Homework, and Grading

There will be two midterm exams plus a cumulative final exam. There will homework assignments consisting of astrophysical problems most weeks.

Your final numerical grade will give the following weight to each of these components of the course:

Midterm exams:	**40% (2 exams, 20% each)**
Final Exam:	**30%**
Homework Assignments:	**30%**

Attendance Policy:

Students are expected to attend each class session unless they have a valid reason for being absent. If you must miss class due to illness or another reason, please notify the instructor as soon as possible, ideally before the absence. See:
https://www.bu.edu/academics/policies/attendance/

Academic Conduct and Collaboration on Homework Assignments

All Boston University students are expected to maintain high standards of academic honesty and integrity. It is your responsibility to be familiar with the Academic Conduct Code, which describes the ethical standards to which BU students are expected to adhere and students' rights and responsibilities as members of BU's learning community. All instances of cheating, plagiarism, and other forms of academic misconduct will be addressed in accordance with this policy. Penalties for academic misconduct can range from failing an assignment or course to suspension or expulsion from the university. See: http://www.bu.edu/cas/current-students/phd-mfa-students/academic-policies-and-conduct-code/

AS706 Class Schedule

Date	Topic	Reading from Rybicki & Lightman [Ghisellini]
W Sep. 5	Basic Concepts of Radiation	1.1-1.3 [1.1-1.6]
F Sep. 7	Radiative Transfer	1.4 [1.8]
M Sep. 10	Blackbody Radiation	1.5 [2.2]
W Sep. 12	Blackbody Radiation	1.5 [2.2]
F Sep. 14	Einstein Coefficients	1.6 [1.9]
M Sep. 17	Scattering	1.7 [1.10]
W Sep. 19	Diffusion of Radiation	1.8
F Sep. 21	Maxwell's Equations	2.1
M Sep. 24	Electromagnetic (E-M) Waves	2.2
W Sep. 26	Spectrum of E-M Radiation	2.3
F Sep. 28	Polarization	2.4
M Oct. 1	Electromagnetic Potentials	2.5, 3.1
W Oct. 3	Velocity & Radiation Fields; Dipole & Quadrupole Radiation	3.2-3.3
F Oct. 5	Thomson Scattering	3.4 [5.2]
T Oct. 9	(M Oct. 8 is a holiday) Thermal Bremsstrahlung Radiation	5.1-5.2 [2.1]
W Oct. 10	**Midterm Exam #1**	Up to 3.4
F Oct. 12	Thermal Bremsstrahlung Radiation	5.1-5.2 [2.1]
M Oct. 15	Thermal Bremsstrahlung Emission & Absorption	5.2-5.3 [2.1]
W Oct. 17	Applications: Ionized Hydrogen (H II) Regions, Accretion Disks, Galaxy Clusters	
F Oct. 19	Synchrotron Radiation I	6.1-6.2 [4.1-4.2]
M Oct. 22	Synchrotron Radiation II	6.2-6.4 [4.3-4.4]
W Oct. 24	Synchrotron Radiation III	6.5-6.8 [4.4-4.6]

F Oct. 26	[Inverse] Compton Scattering	7.1-7.3 [5.3-5.4]
M Oct. 29	Effects of Relativistic Motion	Ch. 4, [Ch.3, 8.9]
W Oct. 31	Applications: Supernova Remnants, Radio Galaxies, Blazars	
F Nov. 2	Non-relativistic [Inverse] Compton scattering	7.4-7.7 [5.6-5.7]
M Nov. 5	Faraday Rotation	8.1-8.2
W Nov. 7	Atomic Structure: Schrödinger Eq., Single Electron Case	9.1-9.2
F Nov. 9	Many-Electron Systems	9.3
M Nov. 12	Perturbations, Atomic Sub-Levels	9.4
W Nov. 14	Zeeman Effect, Hyperfine Splitting of Energy Levels	9.4
F Nov. 16	Population of Energy Levels	9.5
M Nov. 19	Radiative Transitions	10.1
M Nov. 26	Dipole Approximation	10.
W Nov. 28	**Midterm Exam #2**	Ch. 5-9
F Nov. 30	Einstein Coefficients & Oscillator Strengths	10.3
M Dec. 3	Selection Rules & Transition Rates	10.4-10.5
W Dec. 5	Line Profiles; Equivalent Width	10.6
F Dec. 7	Molecular Energy Levels	11.1-11.2
M Dec. 10	Molecular Rotational & Vibrational Spectra	11.3-11.5
W Dec. 12	21 cm Line of Neutral Hydrogen	Notes

Monday December 17, 9:00-11:00 A.M. Final Exam **Entire course**

Boston University Arts & Sciences

Undergraduate Academic Program Office
725 Commonwealth Avenue, Room 102

CAS/GRS Curriculum Request Cover Sheet

DEPARTMENT OR PROGRAM: CAS HISTORY DATE SUBMITTED: 10/25/19

COURSE NUMBER OR TITLE OF DEGREE PROGRAM BEING PROPOSED OR MODIFIED: GRS HI 859

Will this course/minor/program create a need for:

Yes / No

No	**Space/Renovations (office or classroom)?**
No	**Additional staffing (new course offerings or hiring of instructional or administrative staff)?**
No	**Additional budgetary needs (for equipment, supplies, etc.)?**

Further information regarding facilities & equipment, staffing, and budget & cost is requested in the course proposal form and the eCAP Academic Component form (whichever is applicable). Please be sure to use that space to provide a comprehensive explanation of the budgetary implications of your proposal.

CAS/GRS Course Revision Proposal Form

*To be used only for proposing a revision of a CAS course **without BU Hub credit** as well as for **all** GRS courses.*

This completed form and all required documents should be submitted as PDF files to either Sr. Academic Administrator Peter Law pgl@bu.edu (for CAS and CAS/GRS "piggyback" courses) or to Graduate Services Associate Casey Dziuba grsgs@bu.edu (for GRS-only courses). Please contact them for information or assistance, if necessary.

DEPARTMENT OR PROGRAM: CAS HISTORY DATE SUBMITTED: 10/25/19

CURRENT COURSE NUMBER (include college code—CAS or GRS): GRS HI 859

CURRENT COURSE NAME: The United States as a World Power

CURRENT 40 WORD COURSE DESCRIPTION:

Meets with CAS PO 578. The course material is organized along a debate format. Although the course is primarily concerned with twentieth-century U.S. foreign policy, attention is also given to eighteenth- and nineteenth-century issues.

CURRENT CROSS-LISTING DEPARTMENT/PROGRAM, if any: Political Science

TO BE OFFERED NEXT: Sem./Year: _Spring___ /__2021____

INSTRUCTOR(S): David Mayers

ITEMS PROPOSED FOR REVISION (check all that apply):

X Course Number	☐ Credits	☐ Corequisites
☐ Title	☐ 40 Word Description	☐ Other (Explain)
☐ Short Title	☐ Prerequisites	

PROPOSED REVISIONS: For each item checked above, provide the *current information*, then the *proposed information*, then a *brief explanation for the proposed change, including the intended impact of the change.*

1. [First item checked]

   a. Current information: GRS HI 859

   b. Proposed information: CAS HI 578

   c. Explanation & impact: The course should be at the same level as its cross-list, PO 578 in order to a) comply with the new cross listing policy and b) attract undergraduate history students to the course. A course at the 500 level can reach both undergraduates and graduate students. No content has been changed, only the course number

2. [Second item checked]

   a. Current information:

   b. Proposed information:

   c. Explanation & impact:

etc...

IMPACT ON OTHER DEPARTMENTS/PROGRAMS: Will any of these changes have an impact on students pursuing the degree requirements or expectations of other departments, programs, or schools?
Check one: ☐ Yes **X** No

If YES, please identify impacts and attach cognate comment from the appropriate department/ program/ school.

RESOURCE NEEDS: STAFFING, FACILITIES, AND EQUIPMENT: As a result of the proposed changes, will there be any changes in the staffing, special facilities or equipment needs of the course (e.g. laboratory, library, instructional technology, technical resources, etc)?
Check one: ☐ Yes **X** No

If YES, explain further and indicate whether currently available staffing, facilities, and equipment are adequate for the proposed course. (NOTE: Approval of proposed revisions does *not* imply a change in resource commitments on the part of CAS.)

ADDITIONAL DOCUMENTS THAT MUST BE SUBMITTED IN ORDER FOR THIS PROPOSAL TO BE CONSIDERED:

- A complete week-by-week SYLLABUS with student learning objectives, readings, and assignments that reflects the specifications of the course described in this proposal; that is, appropriate level, credits, etc. (See guidelines on "Writing a Syllabus" on the Center for Teaching & Learning website.) A typical, effective syllabus template is provided here under "Curriculum Review & Modification".
- Be sure that syllabus includes your **make-up quiz/exam policy** and expectations for academic honesty, with **URL for pertinent undergraduate or GRS academic conduct code(s).**
- Cognate comment from chairs or directors of relevant departments and/or programs. Use the form here under "Curriculum Review & Modification." You can consult with Dean Joseph Bizup (CAS) at casuap@bu.edu or Dean Emily Barman (GRS) at eabarman@bu.edu to determine which departments or programs inside and outside of CAS/GRS would be appropriate.

DEPARTMENT CONTACT NAME & POSITION: **Cady Steinberg**

DEPARTMENT ADMINISTRATOR

DEPARTMENT CONTACT EMAIL & PHONE: **CADY8590@BU.EDU; 617-353-2551**

Signature(s) required:

DEPARTMENT APPROVAL: _____ 10/30/19
Department Chair Date

_____ 10/30/19
Other Department Chair(s) (required for cross-listed courses) Date

revised 03/21/2019

History 859/ Political Science 578
Class meetings in CAS #225: Mondays, unless otherwise noted, and will be held from 6:30-9:15.
Fall 2018
Boston University

Professor: David Mayers
Phone: 617-353-2543
Office Hours: Monday, 2:30 to 3:30
Wednesday, 2:30 to 4:30

Office: #201
232 Bay State Road
email: dmayers@bu.edu

United States as a World Power

Scope and Objective of the Course:

This class is a research-intensive seminar. It encourages in-depth discussions of controversial subjects. It requires each seminar participant to investigate a particular topic of interest—to drill deep.

This seminar is centered on the following theme: We are especially interested in examining the intellectual foundations of US foreign relations from the presidency of Woodrow Wilson to the end of the Cold War and since.

Broadly speaking, three lines of thought about international policy have competed for dominance during this period: so-called isolationism, collective universalism, and unilateralism. In the 1930s, after discouragements associated with the First World War, a majority of Americans accepted the notion that the United States should concentrate its attention on correcting social-economic problems at home (the Great Depression) and avoid over involvement with Europe's incessant quarrels and rivalries. "Isolationism" assumed its most obvious shape in America's refusal to join or cooperate closely with the League of Nations. After Pearl Harbor, the new popular wisdom about international relations held that primarily with the other great powers—first through the "Grand Alliance," then the United Nations—could the United States assure its security. But with the onset of the Cold War, growing disillusionment with the UN, and a general recognition that the United States was not just one of several states but the preeminent one in the West, a presumption developed that Washington must act boldly around the globe to protect its wide-ranging interests and to foster an international order conducive to the prosperity and safety of Americans. This was the gist of the Truman Doctrine and NSC 68.

Within these broad lines, more specific concepts and ideas have played a role in shaping foreign policy. We shall examine them from the standpoint of their intellectual validity and political influence. And we shall be particularly concerned to see how they

have meshed with offer determinants of U.S. policy—such as economic factors, bureaucratic machinery, domestic politics, and the actions of adversaries and allies. What have been the results, intended and unanticipated?

This Fall 2018, much attention—but by no means all—will be focused on World War II matters, the long Cold War, and Donald Trump diplomacy.

Books:

The following books can be purchased at the Boston University bookstore. These same books are also available at the university library.

1. Michael Bess, *Choices Under Fire*
2. David Coleman, *The Fourteenth Day*
3. Robert Dallek, *Nixon and Kissinger: Partners in Power*
4. Stanley Karnow, *Vietnam: A History*
5. *George Herring, From Colony to Superpower*
6. Patricia O'Toole, *The Moralist: Woodrow Wilson and the World He Made*
7. Melvyn Leffler, *Preponderance of Power*
8. J. Thompson, *A Sense of Power: The Roots of America's Global Role*
9. Michael Sherry, *In the Shadow of War*
10. David Mayers, *FDR's Ambassadors and the Diplomacy of Crisis*

(recommended)

Course Requirements:

Each student will have to write one research/analytical essay (approx. 25 pages) and deliver a class presentation. Essay = 2/3 of grade. Participation in class discussion = 1/3 of grade.

Essay is due in class on December 10.

Late essays will not be accepted unless the request is accompanied by a letter from a doctor or university official.

Reading assignments and discussion schedule:

During the first half of the semester, we shall discuss common readings (per the book list or recommended texts). The second half of the semester will be devoted to student presentations (and critiques) based on research essays-in-progress.

Books should be read by the dates indicated below.

September 10: Introduction to class and general discussion

September 17: World War One and its legacy—Patricia O'Toole, *The Moralist: Woodrow Wilson and the World He Made* and John Thompson, *Sense of Power: The Roots of America's Global Role* and George Herring, *From Colony to Superpower* (assigned portions)

September 24: World War Two and its legacy—John Thompson, *A Sense of Power: The Roots of America's Global Role* and Michael Bess, *Choices Under Fire* and David Mayers, *FDR's Ambassadors and the Diplomacy of Crisis*

October 1: Cold War beginnings—*Melvin* Leffler *Preponderance of Power* and Herring, *From Colony to Superpower* (assigned portions)

October 9 (Tuesday): New Frontier and Vietnam—Michael Sherry, *In the Shadow of War* (assigned portions); Coleman, *The Fourteenth Day*; Karnow, *Vietnam*; Robert Dallek, *Nixon and Kissinger*

October 15: Détente, end of Cold War, and after—Sherry, *In the Shadow of War* (assigned portions), Dallek, *Nixon and Kissinger*, and Herring, *From Colony to Superpower* (assigned portions)

October 22: Since 9/11—readings TBA

October 29: TBA
November 5: TBA
November 12: TBA
November 19: TBA
November 26: TBA
December 10: TBA and essays due

Summary of Student Appeal and Complaint/Grievance Procedures

Introduction
The following is a summary of the processes available to undergraduate and graduate students who seek review of academic and non-academic issues. Generally, students are expected to seek informal resolution of all concerns within the applicable department or program before invoking formal processes. When an informal resolution cannot be reached, however, a student who seeks further review of the matter should follow these formal procedures. To the extent that these processes are set forth in official University policies, links to those statements of policy and more detailed description of processes and procedures are included.

These appeal and grievance procedures apply to students in all programs of the University. Graduate students should refer to the handbooks for their particular programs for more detailed information about the administration and academic policies of the program.

Courses, Grades, and Degrees Policies
Appealing Final Grades [collapsible heading]

Grading is the prerogative of the faculty and is based upon a student's performance against a clearly articulated set of assignments, expectations, and standards.

Undergraduate students may appeal final grades they allege to be arbitrary by following the process articulated in the Policy on Grade Grievances for Undergraduate Students in Boston University Courses.

Summary of Levels of Appeal for Final Grades:

- Informal discussion with the faculty member
- Formal written appeal to the department chair
- Formal written appeal to the Dean
- Dean issues final non-appealable decision

Graduate students' final grades will be changed only in exceptional circumstances. The following circumstances are the unusual exceptions that may warrant a grade appeal: 1) the final grade assigned for a course is based on manifest error, 2) the grade was assigned on some basis other than performance in the course, 3) the grade was assigned to a student by resorting to unreasonable standards different from those which were applied to other students in that course or section of the course, or, 4) the grade assigned to a student on the basis of criteria that are a substantial, unreasonable, and unannounced departure from the instructor's previously articulated standards.

A graduate student who believes a final grade was assigned pursuant to any of the criteria above should first present the case informally to the instructor of record responsible for the course in which the student believes an incorrect grade has been awarded. If the student is not satisfied with the resolution at this first step, the student may submit a formal, written appeal,

with appropriate documentation, to the chair of the department in which the course was offered. The department chair may convene a panel of faculty that will report its determination back to the chair. The chair will issue a written decision on the appeal. If the student is not satisfied with the decision of the department chair, the student may submit a formal, written appeal, with appropriate documentation to the Dean of the school or college in which the course is offered. The decision of the Dean shall be final and not appealable.

Summary of Levels of Appeal for Final Grades:

- Informal discussion with the faculty member
- Formal written appeal to the department chair
- Formal written appeal to the Dean
- Dean issues final non-appealable decision

See also Boston University Policy on Grades and Course Credits

Appeal of Academic Actions [collapsible heading]

An "Academic Action" is an action by a program, department, or school/college based on a student's academic performance or failure to satisfy academic program requirements. Examples of Academic Actions include, but are not limited to, academic probation, suspension, and dismissal.

Undergraduate students may appeal academic suspension or dismissal by following the process articulated in the Academic Standing for Undergraduate Students in Full-Time Programs Policy.

Summary of Levels of Appeal for Academic Suspension Dismissal:

- Formal written appeal to the Dean
- Dean issues final non-appealable decision

For **graduate** students, each college may set its own academic requirements and standards for satisfactory academic performance. These standards and benchmarks for performance are set forth in the online and/or hard copy handbooks for individual graduate programs.

Summary of Levels of Appeal for Academic Actions:

- Seek informal resolution within department, unit, or program
- Formal written appeal to the Dean
- Formal written appeal to the University Provost
- University Provost issues final non-appealable decision

Conduct Policies

Appeal of Academic Disciplinary Actions [collapsible heading]

Academic Disciplinary Action refers to penalties or sanctions imposed for violation of academic policies against cheating, plagiarism or unauthorized assistance as defined by the (appropriate) Academic Conduct Code.

Undergraduate students may appeal academic disciplinary actions by following the process articulated in the Academic Conduct Code.

Summary of Levels of Appeal for Academic Disciplinary Actions:

- Formal written appeal to the Dean
- Formal written appeal to the University Provost
- University Provost issues final non-appealable decision

Graduate students may appeal academic disciplinary actions by following the processes articulated in their school/college academic conduct code. Graduate students should also familiarize themselves with the Graduate Student Academic Misconduct Addendum.

Summary of Levels of Appeal for Academic Disciplinary Actions:

- Formal written appeal to the Dean
- Formal written appeal to the University Provost
- University Provost issues final non-appealable decision

Appeal of Code of Student Responsibilities Violations [collapsible heading]

As members of the University community, Boston University students are expected to respect the rights of all students, faculty and staff and adhere to the policies outlined in the Code of Student Responsibilities, in the Boston University Bulletin, and any applicable school, college, department or graduate program handbooks. An **undergraduate** or **graduate** student who is found guilty of misconduct under the provisions of the Code of Student Responsibilities by the Dean of Students may appeal.

Summary of Levels of Appeal of Code of Student Responsibilities Violations:

- Formal written request to the Dean of Students for a hearing before a panel of the University Board on Student Conduct to the Dean of Students
- Formal written appeal of the finding and/or the sanction to the University Provost
- University Provost may affirm, modify, or reverse the finding and/or sanction or remand the matter back to the Dean of Students
- University Provost issues final non-appealable decision

Intellectual Property Disputes [collapsible heading]

Disputes concerning rights to intellectual property must be resolved according to the procedures set forth in the University's Intellectual Property Policy.

Summary of Levels of Appeal for Intellectual Property Disputes:

- Conflicts will be administered by the Vice President and Associate Provost for Research
- Formal written appeal to the University Provost
- University Provost issues decision

Equal Opportunity and Nondiscrimination Policies

Appeal of Sexual Misconduct/Title IX Policy [collapsible heading]

Boston University is committed to fostering an environment that is free from all forms of sexual misconduct, including sexual assault and sexual harassment. In support of that commitment,

BU takes steps to increase awareness of such misconduct, eliminate its occurrence on campus, provide support for survivors, diligently investigate all reports of sexual misconduct, and deal fairly and firmly with offenders. Creating a safe campus environment and a culture of respect is the shared responsibility of all members of the BU community, individually and collectively.

The University complies with all state and federal discrimination laws, including Title IX of the Higher Education Amendments of 1972, the federal law that prohibits discrimination on the basis of sex in education programs and activities. The Boston University Sexual Misconduct/Title IX Policy ("Policy") is intended to ensure a safe and non-discriminatory educational and work environment.

The University's determination as to whether the respondent's conduct violated the Sexual Misconduct/Title IX Policy will be presumed to have been reached reasonably and appropriately, by a preponderance of the evidence. Therefore, an appeal is available only on the grounds of: 1) Insufficient evidence to support the Investigator's findings; 2) The disciplinary sanction imposed is disproportionate to the violation of the Sexual Misconduct/Title IX Policy; 3) The discovery of new, relevant evidence, that was unavailable to the appealing party during the investigation that could reasonably affect the outcome of the case; and, 4)Prejudicial bias on the part of the Investigator.

Summary of Levels of Appeal of Sexual Misconduct/Title IX Policies:

Both **undergraduate** and **graduate** students must follow the specific appeal process outlined in the Procedures for the Resolution of Sexual Misconduct Complaints (Complaints against Students or Complaints against Faculty, Staff, and Non-Affiliates).

Appeal of Alleged Disability Discrimination

Boston University prohibits discrimination against any individual on the basis of physical or mental disability. This policy extends to all rights, privileges, programs, and activities, including housing, employment, admissions, financial assistance, and educational and athletic programs. It is also the policy of Boston University to provide reasonable accommodations to persons with disabilities unless such accommodations would impose an undue burden or fundamental alteration to the program in question. The purpose of these procedures is to ensure that all complaints of discrimination based on disability are thoroughly and fairly investigated by the authorized units of the University. Boston University will conduct a fair and impartial investigation of all allegations of discrimination, with due regard for the rights of all parties. Retaliation against any individual who has filed a complaint of discrimination, or who has cooperated in the investigation of such a complaint, is unlawful and in violation of Boston University policy.

Summary of Levels of Appeal of Alleged Disability Discrimination:

- Formal grievance filed with the Director of Disability & Access Services
- Decision on investigative report rendered by University Provost, dean, or administrative head
- Formal written appeal to Disability & Access Services
- Appropriate University office issues final non-appealable decision

General Grievances

The following grievance procedures are to be used for student problems or concerns that are not covered by any of the policies or procedures set forth above or articulated elsewhere. As such, these grievance procedures may not be used as a substitute for procedures contemplated under any other policy, including but not limited to, policies regarding academic actions; academic disciplinary actions; Code of Student Responsibilities violations; sexual misconduct; intellectual property; research misconduct or any other policy.
Students are expected to discuss any concerns or grievances initially with the faculty or staff member(s) involved. Students are strongly encouraged to seek informal resolution of grievances through consultations within the academic unit, department or program. Students may also seek assistance with the informal resolution of a grievance through the University's Office of the Ombuds.

If a grievance cannot be resolved informally with the faculty or staff member involved, a student may submit a formal, written grievance to the department or program chair. If there is more than one student with a grievance on a particular matter, each student must submit a separate grievance. The department or program chair will issue a written decision on the grievance within thirty (30) days or as soon thereafter as practical.

Students who wish to appeal from the decision rendered at the department or program level must submit a formal, written appeal to the Dean of the School or College within ten (10) calendar days after receipt of written notice of the decision by the department, unit, or program head, or director or designated committee. The Dean may delegate review of the matter to another individual or committee, who shall make a recommendation to the Dean. The Dean shall render a decision on the appeal within thirty (30) days or as soon thereafter as practical.

Students who wish to appeal the written decision of the Dean must submit a formal written appeal to the University Provost within ten (10) calendar days after receipt of the Dean's decision. The University Provost may delegate review of the matter to another individual or committee, who shall make a recommendation to the Provost. The University Provost shall render a decision on the appeal within thirty (30) days or as soon thereafter as practical. Decisions by the Provost are final and not appealable.

Summary of Levels of Appeal for General Grievances:

- Seek informal resolution within department or program
- Formal written appeal to the appropriate department or program chair
- Formal written appeal to the Dean
- Formal written appeal to the University Provost
- University Provost issues final non-appealable decision