UNIVERSITY OF TORONTO SCARBOROUGH

UTSC Major Calendar Changes, 2011-12
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1. New Programs:

MINOR PROGRAM IN LITERATURE AND FILM STUDIES

Department of English
[New program where there is no pre-existing Specialist or Major program]

- *New Courses:* None
- *Proposal:*

DEPARTMENT: ENGLISH
PROGRAM TYPE: MINOR

PROGRAM NAME: LITERATURE AND FILM STUDIES
DEGREE TYPE: ARTS
NUMBER OF CREDITS REQUIRED: 4.0 FCE

PROGRAM RATIONALE

1. What is the rationale for the program?
This program offers students a chance to study cinema within the broader context of twentieth-century literature and culture. Cinema as an art form emerged in conjunction with globalization, new technologies of communication and industrial production, new experiences of time and space, and mass literacy; cinema, along with literature, and often in dialogue with it, represented and made sense of these changes.

The consolidation Literature and Film Studies as a minor program recognizes an existing strength in the UTSC Department of English—a cluster of courses that is already well integrated and serving large numbers of students. A minor in Literature and Film Studies, which draws together two dominant narrative media, will support the Department's future development of narrative studies as its central academic focus.

2. *How does the program compare with similar programs offered by peer institutions? Does it have innovative features?*
Literature and Film Studies is a recognized field at many institutions, for example, Yale University and the University of Alberta. At many other institutions, including the University of Toronto's Innis College, there are programs in Cinema Studies, which study film as an art form and medium of communication in all its dimensions, including film production. UTM offers a program in Visual Culture, which overlaps in some respects with the study of film at UTSC.

However, our program, which is housed in a literature department, has a number of distinct and innovative features: first, it studies film as narrative—as text. Our analytical methods derive from literary studies. Indeed, film as an art form, and film as narrative, was first studied in English departments across North America. Major works in the field emphasize these links, among them *A Companion to Literature and Film* (edited by Robert Stam, published by Blackwell in 2007) and Seymour Chatman's *Coming to Terms: The Rhetoric of Narrative in Fiction and Film* (Cornell UP, 1990). Our required introductory courses, ENGA10 and

ENGA11 recognize these persistent links. We also offer a course ENGC56 Literature and Media: From Page to Screen, which recognizes the narratological foundations and crosscurrents. Second, the study of film alongside literature enables students to transfer the tools for the study of one medium of representation to many others. The tools for studying film can be transferred back to literary study (early film theorists traced the origins of "cross-cutting" back to novelist Charles Dickens). Because students often have more facility with the analysis of visual media, they can use what they learn in film courses as a way to better understand elements of poetry or narrative. Many of our literature courses include significant units of film theory and analysis.

3. How does the program relate to the goals and objectives of the Department?

The minor in Literature and Film Studies offers students a unique program that draws on existing strengths of our department. However, it is also explicitly part of the department's plan to make narrative studies our academic focus. The cluster of courses in this minor will serve as a model for the development of other narrative clusters such as narratives of place and nation, historical narrative, poetic narrative, and so on.

4. What are the goals and learning objectives of the program and how does its structure support them?

- Students gain an understanding of the common narrative foundations of literature and film.
- Students learn to analyze film as a distinctive medium; they learn film terms and write essays about film.
- Students learn how film makes meaning, how film creates identities and communities, how film may be ideological and political.
- Students learn to recognize the power of images in their everyday lives; they learn to think critically about film and other visual media.
- Students develop a language and critical toolbox that may be used in analyzing literature and other forms of narrative communication.

The learning objectives are met through the structure of the minor program in literature and film. The introductory courses analyze literature and film side by side. At the B-level, students take "Introduction to Film" where they gain an understanding of film as medium—both as technology and art form. They also take courses in Hollywood cinema that expose them to different cinematic genres and to the cultural embeddedness of our film traditions. At the C level, students look at film in the context of the wider world (in topics in world cinema), at film theory and dominant themes, at issues of adaptation between literature and film, at the representation of the body in visual and literary media. D-level classes look in more detail at such issues as constructions of race in cinema, theories of spectatorship, documentary, and the filmmaker as author.

5. Is there student demand for the program? What are the expected program enrolments initially and in steady state? Provide evidence to support your projections.

160 students have joined a Facebook site set up for students interested in a minor, should it become available. The B-level classes regularly enroll 150 students or more. All cinema classes offered at the C- or D-level have always filled to capacity. We anticipate that the minor will attract 150 students at its inception, and may grow to 200 in the year or two following.

DEGREE LEVEL EXPECTATIONS

1. How does the program link with scholarship and rigour in the discipline? Does it address the current state of the area of study?

Below is a partial list of works that have been featured in various cinema classes available (and required) in the program. You will note all are published in the last decade or so. "Classical" film studies texts are also encountered by students, but offering a "current state" approach to cinema is one of the overwhelming strengths of this minor program:

Modernity on endless trial
Leszek Kolakowski - 1997
Modernity and Technology
Thomas J. Misa, Philip Brey, Andrew Feenberg - 2004.
Modernity and the Holocaust
Zygmunt Bauman - - 2000 -
The Theological Origins of Modernity
Michael Allen Gillespie, 2008
Suspensions of Perception: Attention, Spectacle, and Modern Culture
Jonathan Crary, 2001
Travelling Light: Photography, Travel and Visual Culture
Peter Osborne, 2000
Parallel Tracks: The Railroad and Silent Cinema
Lynne Kirby, 1997
Savage Theory: Cinema as Modern Magic
Rachel O. Moore, 2000
Cinema and Modernity
Murray Pomerance, 2006
The Black Atlantic: Modernity and Double Consciousness
Paul Gilroy,1995
The New Voices of Islam: Rethinking Politics and Modernity : a Reader
Mehran Kamrava, 2007
The Visual Turn: Classical Film Theory and Art History
Angela Dalle Vacche, 2002
Visions of Japanese Modernity: Articulations of Cinema, Nation, and Spectatorship, 1895-1925
Aaron Gerow, 2010
Empty Moments: Cinema, Modernity, and Drift
Leo Charney, 1998
Film Noir and the Spaces of Modernity
Edward Dimendberg, 2004
Modernity and Metropolis: Writing, Film and Urban Formations
Peter Brooker, 2002
Moving Pictures, Migrating Identities
Eva Rueschmann, 2007
Shakespeare, Film Studies, and the Visual Cultures of Modernity
Anthony R. Guneratne, 2008
Migrating to the Movies: Cinema and Black Urban Modernity

2. How does the structure of the program ensure that depth is achieved in the subject?
The program is designed to move students from breadth to depth. The A-level introduces students to the study of Literature and Film. The B-level brings them into the study of film as art form and medium of communication, giving them deeper knowledge of its genres, national traditions, and terms of analysis. The C-level gives students a variety of approaches to the study of literature and film (dystopias, the body, cinema in a global context, adaptation, and film theory). The D-level lets students go into depth in particular aspects of film: race, documentary, spectatorship, the avant-garde, the film auteur.

On average, students view one film a week. Completion of the minor, therefore, exposes students to the discussion and analysis of approximately 100 films—features as well as shorts, documentaries, animation, and avant-garde films. Approaches to these films are also varied: semiotic, formalist, historical, social, cultural, psychological, and economic, to name some of the most dominant. Methodologies illustrated and employed hail from domains as diverse as the psychological, the social, the economic, the aesthetic, the cognitive, the philosophical and the theological.

3. How will students gain knowledge of methodologies?
Faculty in Literature and Film Studies model methods through their teaching and require students to complete assignments that require them to show they've understood the methods of the course. The methods are drawn primarily from English studies, with a particular focus on the analysis of narrative in literature and film, though with an allowance for non-narrative forms of literature and film.

4. Will students completing the program be able to frame relevant questions for further inquiry? Will they be able to seek the tools through which they can effectively address such questions? Please elaborate.
We aim to give students an analytical toolbox that encourages students to look beyond defined film studies texts in order to frame innovative questions that keep pace with the incredibly swift changes in our current "age of spectacle." Film is presented as a multi-determined nexus point that requires a multidisciplinary approach. Students are also encouraged to bring the methodologies from their other programs to bear on their coursework in the minor, just as they are bringing the methods of literary analysis to their study of film. Among students already enrolled in these film classes, and already interested in cinema as a minor, are students from Management, Neuroscience, Psychology, History, Philosophy, Sociology, Anthropology, Computer Science, and Biology. They all express interest in the program as a way to further explore implications of their major fields of study and not as something separate from other fields of knowledge.

5. What are the connections, if any, with activities outside the classroom?
Although we do not teach film production in our Literature and Film Studies minor, many students will want to try filmmaking as a result of their study of film (just as many students try creative writing because they love literature). About 150 students have organized themselves into a group called Cinematrix. They hold an annual student film festival where prizes are given to the best productions. It also serves as a "clearing house" where students interested in various aspects of film production (acting, screenplay writing, production, set-design, costume, lighting, directing, editing) can meet and share both their talents and their

resources (access to cameras, editing equipment, etc.).

Alice Maurice and Garry Leonard are both in touch with the new Bell Lightbox downtown, a ten-million-dollar facility set to go online this fall, and preliminary plans have been made to hold classes, have viewings, give lectures, etc. in this new facility that will also be the home of the Toronto International Film Festival. In that capacity, students will have access to visiting directors, actors, producers, etc.

6. What skills, competencies or expertise will students completing the program have gained?
They will know how to analyze an image; how to assess ideological implications of a given representation; how to discuss the many issues of the twentieth century and our own time through the prism of film and literature. Like students in other English programs, students in Literature and Film Studies will gain critical writing and research skills that will serve them well in an employment market where traditional liberal arts skills are valued for their adaptability and communicability.

7. Will the program prepare students for further study? Please elaborate
The Literature and Film Studies program would complement other minors, majors, or specialists. In the case of someone in Management, for example, it would be both distinctive in terms of approach and complementary in terms, say, of the study of commodity culture and capitalist technologies. In the case of English or History or Philosophy it would offer a concentrated example of a field of study that intersects with methodologies and texts they are encountering elsewhere. It would show a student's readiness to pursue a Masters or doctorate in cinema studies. Or, in the case where a student is a specialist in English, a minor in cinema would show valuable diversity as departments recognize more and more the value of a familiarity with interdisciplinary methodologies and research competencies.

8. What sort of occupations might the program prepare students for?
While not a degree in film production, the program pays attention to editing, lighting, framing, set design, etc. and this would provide a solid foundation for further work in the production end. Indeed, a lot of students in these classes engage in production through the Cinematrix group mentioned earlier. The minor being developed in Media in VPA as well as their courses in Studio would also be a natural complement to pursuing work in production.

The minor would also provide another "teachable" for students looking for a career in education. Secondary education is increasingly interested in "Media Literacy" for its students; anyone completing this program would be in a good position to offer a current, provocative class to those High School students uncritically immersed in Facebook, blackberries, "American Idol", CNN versus Fox versus Al Jazeera, but not sure what it all means, or how it is interconnected as well as interdependent.

9. How does the program fulfill the UTSC writing policy?
All eight HCEs feature at least one or two critical writing components in the form of short essays, midterms, and final exams with essay questions, research papers, position papers, online discussions, and journal writing.

RESOURCES
Please provide evidence of sufficient commitment among your permanent faculty to make the program viable. In particular:

1. Provide evidence of relevant scholarship among sufficient faculty to ensure the intellectual quality of the program.

ALICE MAURICE
Current Research
Completing a book manuscript titled The Cinema and Its Shadow: Race, Apparatus, Meaning. The study focuses on race and realism in early U.S. cinema.

Journal Publications
"From New Deal to No Deal: Blackface, Bamboozled, and Reality Television" in Burnt Cork: Traditions and Legacies of Minstrelsy. (submitted)

"Queer Customers: Steven Crane's *The Monster* and Early Cinema" (in manuscript)
"What the Shadow Knows: Race, Image, and Meaning in Shadows (1922)," Cinema Journal 47.3 (Spring, 2008): 66-89.

"Cinema at Its Source": Synchronizing Race and Sound in the Early Talkies". Camera Obscura - 49 (Volume 17, Number 1), 2002, pp. 1-71.

"The Essence of Motion: Figure, Frame and the Racial Body in Early Silent Cinema," Moving Image 1.2 (Fall, 2001).

Film & Video Productions
Associate Producer, *A Healthy Baby Girl* (1997), Winner of the Peabody Award.
Associate Producer, *Defending Our Lives* (1994), Winner of the Academy Award for Best Documentary Short Subject.

GARRY LEONARD
Books:
Advertising and Commodity Culture in Joyce. Gainesville, Florida: University Press of Florida, 1998.

In Manuscript: Six Ways of Looking at Modernity: Hollywood Cinematic Genre and the Production of the Modern Self.

Articles in Refereed Journals:
"'The Eye Altering, Alters All': Did William Blake Invent Cinema?" University of Toronto Quarterly, special issue: Blake In Our Time (forthcoming)

"Globalization and Its Discontents: 'Film Noir' Sensibility and Coercive Modernity" University of Toronto Quarterly, special issue: Politics and Affect (forthcoming)

"'The Killer Inside of Me': Nietzschean Ressentiment and Voice Over in Film Noir"

Film Quarterly (submitted)

"'Come Back, Shane': the Eclipse of Value by Price in Hollywood Westerns"
European Studies of American Culture (submitted)

"A Nightmare on My Street: Divorce and the Teenage Slasher Film"
Horror Studies (submitted)

"Metaphor and Montage: Film versus Poetry". (with Gerald Cupchik)
Cognitive Semiotics (forthcoming).

"Technically Human: Kubrick's Frame in *2001: A Space Odyssey* and Heidegger's Enframing" in Film and Philosophy (forthcoming)

"'Let's Get Fiscal: Moving From Negotiation to Intimacy in the Hollywood Romance" in Jump Cut (forthcoming).

"Crying in the Dark, Rising Up Toward the Light: Hollywood Melodrama and the Feeling of Transcendence" in University of Toronto Quarterly (Spring 2010)

"Monsters and Mortgages: The Horror Movie as Prime Economic Indicator" in Film International Vol. 43.2 (Spring 2010).

"He's Got Bette Davis Eyes: James Joyce and Melodrama" in Joyce Studies Annual 2008. Fordham University Press.

"Melodrama and Film Noir on Today's Big Screen: How Modern Audiences Experience Yesterday's Classics". Psychology of Aesthetics, Creativity, and the Arts, 2(4), 203-212 (2008).

Chapters in Peer-reviewed edited collections:
"I Watch Therefore I Am: Visual Juxtapositions in Cinema and the Alignment of the Modern Self". Psychology and Film, ed. Gerald Cupchik (forthcoming).

"'The Famished Roar of Automobiles': Modernity, the Internal Combustion Engine, and Modernism" in Disciplining Modernism, ed. Pamela Caughie. (New York: Palgrave Press) (forthcoming)

2. Who are the permanent faculty who will teach the core courses in the program, and who else among the permanent faculty is committed to teaching in the program?
Garry Leonard and Alice Maurice in English

3. Are there permanent faculty prepared to act as program supervisor?
Yes.

4. Are new courses being proposed in order to mount the program? If yes, please specify and attach the appropriate new course forms.
All the courses required are already approved and in place.

5. Will new resources be required to offer the program and related new courses (e.g. faculty, T.A. support, teaching space, equipment)? Will it require part-time or sessional faculty on an on-going basis? Please elaborate and explain.
The program will not require part-time or sessional faculty on an on-going basis, though leave replacements will be essential to keep the continuity when Garry Leonard or Alice Maurice are on leave.

6. Do the sequencing, cycling and distribution of courses across sessions make it possible for students to complete the program in a reasonable length of time?
Yes. The A level and at least one B level is offered every year. Other Blevels cycle every other year. At least two C levels and two D levels are offered each calendar year:

Taught every year by continuing faculty: A10 Introduction to Twentieth-Century Literature and Film, 1895 to World War II (average enrolment: 315)
Taught every year by continuing faculty: A11 Introduction to Twentieth-Century Literature and Film, World War II to the Present (average enrolment: 315)

Taught every year by continuing faculty: B70 Introduction to Cinema (average enrolment: 175)
Taught every other year by continuing faculty: B75 Cinema and Modernity I: Melodrama, Film Noir, the Western(average enrolment: 175)
Taught every other year by continuing faculty: B76 Cinema and Modernity II: Romance, Horror, Science Fiction (average enrolment: 175)

Taught every other year by continuing faculty: C76 The Body in Modernity: Theories and Representations (average enrolment: 100)
Taught every other year by continuing faculty: C77 The Body in Contemporary Culture (average enrolment: 100)

(All C-levels, except C76 and C77, are currently capped at 50) (*Please note: Garry Leonard currently teaches this course jointly with Lora Carney of the Department of Humanities; after two more years, these courses will be consolidated as Department of English courses only.)

Taught every other year by continuing faculty:
C56 Literature and Media: From Page to Screen (average enrolment: 50)
C78 Dystopian Visions in Fiction and Film (average enrolment: 50)
C82 Cinema Studies: Themes and Theories (average enrolment: 50)
C83 Studies in World Cinema (average enrolment: 50)

(All D-levels are currently capped at 22)

At least one, usually two, of these taught every year by continuing faculty:
D52 Cinema: The Auteur Theory
D62 Topics in Postcolonial Literature and Film
D91 Avant-Garde Cinema
D93 Theoretical Approaches to Cinema
D94 Stranger than Fiction: The Documentary Film

TEACHING

1. What are the proposed modes of delivery of the components of the program? Explain why they are appropriate.
Everything will be delivered through course work. At the A and the B level, there will be lecture format supplemented by journal writing and online discussions. At the C level and D level group work, class presentations and a research essay will be a major component.

2. What are the methods of assessment of student achievement in the program? Explain how they are appropriate in light of the learning outcomes of the program and the UTSC Degree Level Expectations.
Quizzes, midterms, finals, short essays, research essays, online discussions, group work, class presentations. The quizzes will test for familiarity with the material. Both the midterm and the final will include detailed scene analyses in the context of relevant questions. The group work and the research paper will help develop original thinking. The short essays are useful for exploring a particular methodology relative to a film or scene. The online discussion, though informal, are a place to speculate and receive immediate feedback from other interested students. The journal entries introduce a personal note along the lines of why this method and subject of study is of particular interest, above and beyond course credit and GPAs.

3. How will the level of performance of students in the program be documented and demonstrated?
Through the methods of assessment listed above, all of which occur in written or oral form.

ADMISSION TO THE PROGRAM

1. Is an enrolment limit proposed for the program? If yes, please indicate the limit and explain why it is necessary.
No.

2. Are you proposing that it be a direct entry program? If yes, please explain why direct entry is necessary.
No.

3. Are there any required high school courses or recommended preparation for students considering the program? If so, please specify and provide a rationale.
No.

4. Are there required university courses or recommended preparation for students considering the program? If so, please specify and provide a rationale.
No.

INTERDEPARTMENTAL CONSULTATION

Does the program require courses from another UTSC Department?
No.

TRICAMPUS CONSULTATION

1. Are there similar programs in the Faculty of Arts & Science or at UTM?

Innis college offers a minor, major, and specialist in cinema. We don't see overlap or competition any more here than we see it between UTSC English and English on the St. George campus. However, our program places a special emphasis on Literature *and* Film.

UTM offers a Visual Culture and Communication program that is also interested in issues of the visual and the global, but with no particular emphasis on cinema. Additionally, it is designed to interface with Communication Studies at Sheridan college: "Visual Culture and Communication is an interdisciplinary undergraduate curriculum that provides students with a foundation in both visual cultural and communication studies (history, theory and criticism) and digital communication practices (with courses taught at Sheridan College)."

The Visual and Performing Arts discipline in Humanities has courses in Media studies and various forms of digital Art production as well as photography. The emphasis is on forms of media, contemporary digital, and studio production so it is complementary to an academic program on cinema studies within the context of modernity, but nonetheless has different goals and intended outcomes than our program.

2. If yes, how does this program compare with them?

The UTSC minor is geared toward an exploration of film and literature in the context of narrative studies, in concert with the offerings and approaches we feature already in the curriculum of the English Department.

3. Are Faculty of Arts & Science & UTM cognate departments or disciplines aware of the proposed program? What feedback did you receive?

The cinema cluster, as we have called it until now, has been discussed from time to time with downtown and UTM. Students who have taken classes in the cinema cluster have gone on to enroll in the MA program in cinema at Innis College. <u>Here are excerpts from email messages:</u>

Dear Garry,

FROM UTM Visual Culture Program:

Thanks for letting me know about the Lit and Film minor at UTSC. Sounds like an innovative and interdisciplinary program and I am glad that things are being formalized in your neck of the woods.
All best, Louis
-- **Louis Kaplan Chair, Department of Visual Studies University of Toronto Mississauga**

From Charlie Keil at Innis:

That's fantastic news. The more strength Cinema Studies gains across the three campuses, the more it will help all of us in the long run.

Hi Christine,

I wanted you to know of this support (they were also sent our completed application for the cinema minor). this represents two very respected Academic programs who have looked at our porosal in all its detail.

best
garry

REQUIRED COURSEWORK FOR THE PROPOSED MINOR

Required total: 8 half courses (4.0 FCEs)

1. Four half courses (2.0 FCEs) , as follows:

A10H [**Offered Fall 2010**, Wednesdays, 9 to 11am, AA112, LEONARD]

OR

A11H [Offered Spring 2011, Wednesdays, 9 to 11am, AA112, LEONARD]

B70H [**Offered Fall 2010**, Tuesday 10-1 [lecture], SW143 and Tuesday 1-3 [screening], SW319
Prof. A. Maurice]

B75H [Offered Summer 2011]
OR
B76H [Offered Summer 2012]

C76H [Offered Fall 2011]
OR
C77H [**Offered Fall 2010**; Monday 7-10 pm, SW128 Prof. G. Leonard]

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2. Four additional half courses, at least one of which must be at the C level and one at the D level.

NOTE 1: If you took A10 to fulfill the requirement of taking either A10 or A11, then A11 can count as an elective. The same thing applies for B75/76 and C76/77. Taking all of the above courses, for example, would complete your four requirements, plus three electives, and what would remain is a required D- level.

NOTE 2: All of the above are also listed as "English" courses and could be applied to the English minor, major, or specialist programs. NONE OF THEM are required for the English minor/major/specialist, but they can count as electives.

What this means in practice is you can take ENGA10 or A11 and decide whether you want to use it to spring into an English program or the Literature and Film Studies program. Obviously, minors in English and Literature and Film Studies are easily done, as is a Major or Specialist in English with the Literature and Film Studies minor. At a total of four full course equivalents, the Literature and Film Studies minor could also complement a major or specialist in other divisions.

Additional C- and D-level courses offered Fall 2010 and Spring 2011:

ENGD93H: Theoretical Approaches to Cinema
Topic: Cinema and Spectatorship. [**Offered Fall 2010**, Thursday 11-1, BV516, Prof. A. Maurice]
ENGC56H: Literature and Media: From Page to Screen. [**Offered Spring 2011**, Tuesday 3-6, BV264, Prof. A. Maurice]
ENGD62H: Topics in Postcolonial Literature and Film
Topic: TBA [**Offered Spring 2011**, Thursday 1-3, MW264, Prof. A. Peat]
ENGC82H: Cinema Studies: Themes and Theories
Topic: Globalization and Its Discontents: 'Film Noir' as a Transhistorical, Transnational Critique of Modernity [**Offered Spring 2011**, Monday 5-7 [screening], MW170, and 7-10 pm [lecture], HW215, Prof. G. Leonard]

Complete list of required and elective courses in the cinema minor:

ENGA10H3 Introduction to Twentieth-Century Literature and Film: 1890 to World War II
ENGA11H3 Introduction to Twentieth-Century Literature and Film: 1945 to Today
ENGB70H3 Introduction to Cinema
ENGB75H3 Cinema and Modernity I
ENGB76H3 Cinema and Modernity II
ENGC56H3 Literature and Media: From Page to Screen
ENGC76H3 The Body in Modernity: Theories and Representations
ENGC77H3 The Body in Contemporary Culture: Theories and Representations
ENGC78H3 Dystopian Visions in Fiction and Film
ENGC82H3 Cinema Studies: Themes and Theories
ENGC83H3 Studies in World Cinema
ENGD52H3 Cinema: The Auteur Theory
ENGD62H3 Topics in Postcolonial Literature and Film
ENGD91H3 Avant-Garde Cinema
ENGD93H3 Theoretical Approaches to Cinema
ENGD94H3 Stranger than Fiction: The Documentary Film

Please note: film courses selected from other departments and disciplines will be approved for the minor in Cinema Studies on a case by case basis.

FALL: ENGA10H: Introduction to Twentieth Century Literature and Film: 1890 to World War II

A study of literature and film against the backdrop of the Twentieth Century, from 1895 to the onset of World War II. What was the affect of Darwin, Marx, Nietzsche, Freud de-centering concepts of humanity? Matthew Arnold put it this way: "I wander between two worlds. One dead, the other powerless to be born." Auden announced the coming of "the Age of Anxiety". Eliot's defining 1922 poem is called "The Wasteland". And yet the Twentieth Century and the Twenty-first are still seen as participating in the Enlightenment project, a project devoted to constant announcements of progress, perpetual offerings of unprecedented satisfaction, and aggressively marketed examples of innovation. We will begin in the 1890s, a time that saw the invention of cinema as well as, in the space of ten years, the publication of Dr Jekyll and Mr Hyde, The Picture of Dorian Gray, Dracula, Heart of Darkness and Freud's Interpretation of Dreams. All of these works, separately and together, tell of a deep unease at the heart of what has come to be known as "modernity". Moving forward through works by James Joyce and Virginia Woolf, we will look at the cultural trauma of World War I. An emphasis on film and its unique relationship to the Twentieth Century will be fostered by lectures on Charlie Chaplin's Modern Times and the way it showcases rising concerns that modernity has profound, often hidden costs at the personal level, even as it is made to appear more and more astonishing and progressive on the global level.

Wednesday 9-11, AA112
Prof. G. Leonard

FALL: ENGB70H: Introduction to Cinema

An introduction to the critical study of cinema, including films from a broad range of genres, nations, and eras, as well as readings representing the major critical approaches to cinema that have developed over the past century. In this course, we will "read" films in much the same way as we read other texts. The course will introduce students to the vocabulary of film criticism: by paying attention to "film language" (elements including cinematography, editing, mise-en-scène, sound, narrative construction, performance styles, etc.), we can begin to analyze films as works of art and as cultural and economic products. We will also think about our own interactions with the movies we watch: how do the movies teach us to see, and how do the movies "see" us? Throughout, our goal will be to think critically and to write persuasively about a medium we usually take for granted. Course requirements will include weekly viewing responses, one short essay, a midterm and a final. Please note the screening time associated with this class.

Tuesday 10-1 [lecture], SW143 and Tuesday 1-3 [screening], SW319
Prof. A. Maurice

FALL: ENGC77H: The Body in Contemporary Culture: Theories and Representations

A two-part course focusing on the experience of the body in modernity (along with C76, though they can be taken in any order). "Modernity" has been defined in various ways. Historically, it is roughly synonymous with the era following the Industrial Revolution, especially the late nineteenth and twentieth century. Philosophically, it is seen as a late phase of "The Age of Enlightenment" where both the good and the bad of an emphasis on

rationality can be seen. Economically, it is the triumph of capitalism, and, more recently, commodity culture, globalisation, and advertising. Psychologically, it is often seen as a time of unprecedented personal freedom for some and the near absence of freedom for others. Apparently unlimited opportunity clashes with a nearly unappeasable sense of there not being enough. Culturally, modernity is represented by such movements as impressionism, post-impressionism, modernism, post-modernism, etc. What these quite distinct movements seem to have in common is a crisis in "reality". Modernists sometimes seek to recover it, post-modernists question whether or not it was ever there, but the question is : "what is real about reality?" And so "the body" becomes a crucial site of contested "realities" because it is taken as being unavoidably "real". As such, it is used to authenticate and legitimate any number of competing discourses. That is why, in studying representations and theories of the body in the twentieth century we are, necessarily and unavoidably, concerned with modernity. A too-simple contrast might help make the point: modern history is our best account of what has happened in the twentieth century; modernity is what it feels like. For the contemporary world there is no authority other than experience for how we map the former Cartesian logic of body and mind. Notions of spirit and soul come back into the picture, sometimes as nostalgia, but also as an essential dynamic that has been lost and must be re-inaugurated, even if the content is no longer theologically based. Dualities of subject and object, mind and body, ego and world, are now a "matrix" from which we are desperate to "unplug" even as we doubt our capacity to live without distraction, compensation and strategies of displacement. concepts of "hysteria", "paranoia", "depression" and other symptoms are re-examined to see if we have isolated and pathologized precisely what formerly went into the make-up of what we called our "soul". From the modern fear the body might become a machine, have we inverted this equation in the contemporary world? Is the contemporary body now striving to be pre-modern? Is it a rough beast, its hour come round at last, slouching toward Bethlehem to be born?
Monday 7-10 pm, SW128
Prof. G. Leonard

FALL: ENGD93H: Theoretical Approaches to Cinema
Topic: Cinema and Spectatorship
This course will introduce students to major debates and topics in film theory. We will watch films and consider them in light of the various theoretical approaches to the cinema that have developed over the course of the last century. In particular, we will focus on the figure of the spectator. Theorists have approached the relationship between movie and viewer from psychological, semiotic, sociological, cultural, and phenomenological perspectives, asking questions like: Are movies like dreams? How and why do we identify with the "stars" or characters on screen? How do elements including cinematography and editing affect how we see? What kind of audience is imagined or addressed by mainstream movies? How do we come to understand the relationship between movies and "reality"? How do issues including race, gender, and sexuality impact the way we watch movies? What is the relationship between the individual spectator and the group audience? Throughout the course, we will think about how our movie-viewing habits have changed, especially since the advent of video, DVDs, PVRs, the internet, hand-held devices, etc. Please be aware that this is a reading-intensive course focusing on challenging theoretical texts. Movies may include: Rear Window, Fight Club, Bamboozled, Citizen Kane, Meshes of the Afternoon, Stagecoach, and The

Journals of Knud Rasmussen. Authors may include: Sergei Eisenstein, Siegfried Kracauer, Andre Bazin, Walter Benjamin, Peter Wollen, Rudolf Arnheim, Maya Deren, Richard Dyer, Laura Mulvey, Kaja Silverman, bell hooks, Stanley Cavell, and Manthia Diawara. Course Requirements: two essays and a series of reading responses.
Thursday 11-1, BV516
Prof. A. Maurice

SPRING: ENGA11H: Introduction to Twentieth Century Literature and Film: 1945 to Today

In ENGA11, we will continue our study of literature and film against the backdrop of Twentieth Century modernity, from 1945 to the present. In lectures on works such as Becket's Waiting for Godot, we will place the rise of fascism, and its discourse of mastery, alongside the loss of transcendental certitude and the post-enlightenment crisis brought on by the Atomic Age and the Holocaust. Ethnic, racial and postcolonial issues will figure prominently in discussions of Naipaul's Miguel Street and Morrison's The Bluest Eye. Issues of identity and postmodernism will be explored in the novel White Noise and Hitchcock's Vertigo. At all times we will be interested in the lived experience of modernity—what it felt like—as well as whatever it was, and whatever it still is. Wednesday 9-11, AA112
Prof. G. Leonard

SPRING: ENGC56H: Literature and Media: From Page to Screen

In this course we will explore the relationship between literature and film. We will think about adaptation in the broadest sense: How do films adapt literary texts? How might we think of literary texts as "adaptations" in themselves? How do literary texts influence and shape films? What happens when films are "novelized"? How do readers and film fans impact the relationship between literature and film? In this course we will get beyond the question of "good" or "bad" adaptations in order to consider literary and film narratives as linked, but also utterly distinct, cultural objects. Texts and films may include: Mary Shelley, Frankenstein; Philip K. Dick, Do Androids Dream of Electric Sheep?; Kazuo Ishiguro, Remains of the Day, Tom Perrotta, Little Children, and Susan Orlean, The Orchid Thief. Films may include Frankenstein (James Whale, 1931), Gods and Monsters (Bill Condon, 1998), Blade Runner (Ridley Scott, 1982), Remains of the Day (James Ivory, 1993), Little Children (Todd Field, 2006), and Adaptation (Spike Jonze, 2002). Course Requirements: There will be a midterm and two essays.
Tuesday 3-6, BV264
Prof. A. Maurice

SPRING: ENGC82H: Cinema Studies: Themes and Theories
Topic: Globalization and Its Discontents: 'Film Noir' as a Transhistorical, Transnational Critique of Modernity

A study of 'film noir' sensibility--hard-boiled detectives, fatal women, shadowy urban streets--from a transhistorical, transnational perspective. Classic 'film noir', as christened by French New Wave directors, referred to a dozen or so movies made in Hollywood from 1940 to 1955. But this 'noir' sensibility is as old as cinema itself, and its stylistic icons have migrated restlessly back and forth across the complex geo-political terrain of world cinema. Its depiction of rootless and wandering desire, of empty public spaces and inauthentic relationships, all set against the indifference of modern systems of circulation and exchange,

is a fully international phenomenon that expresses disquiet with relentless change, the eradication of tradition, uneven distributions of wealth, manipulative idealism, rampant corruption, the decline of military imperialism, and the simultaneous rise of cultural and economic manipulation of 'developing' nations. It focuses obsessively on the local, but in a way that reflects the impact of the global. It features displaced persons in hotels, bars and bus stations, walking urban streets, reflecting a little acknowledged reality that 'modernization' entraps, alienates, dissociates and demoralizes as much as it inaugurates apparent progress. Passion, madness, paranoia and trauma get set against an industrialized, commodified, bureaucratized and rationalized world which is thereby exposed as, itself, irrational and unstable. The voice over that Noir made famous re-imposes a quietly anguished subjectivity over a ruthlessly objectified world. The well-known complexities of flashbacks, amnesia, and traumatic memories can be seen as a radical resetting of modernity's clock for the citizens of conquered and conquering nations, encountering rapid urbanization, uneven economic development benefitting the few at the expense of the many, social dislocation and cultural alienation. Precedents for Hollywood film noir can be found in the first movies ever made of trains entering stations and workers leaving factories; they can be found in German Expressionism after World War I, and in Italian Neo-realism after World War II. A parallel noir sensibility sprung up Japan in the early films of Kurosawa. It can be found yet again in the cinema of India right after Independence and during the rapid onset of modernization that followed. It flourished yet again in Iran between the fall of the Shah and the onset of the Islamic revolution. We will explore this fusion of visuality and sensibility as both a reflection and symptom of global modernization. Our particular emphasis will be on the way film noir represents and explores gritty, localized despair in order to explore both the effect and the affect generated by world-wide economic interconnectedness, unregulated markets, transnational corporations, and the mobile and dislocated social and cultural relations of modernity that follow in its wake. Films studied will include: The Last Laugh (German), Out of the Past, Sunset Boulevard (US), Drunken Angel (Japan), Exotica (Canadian), Obsession (Italian), C.I.D. (Indian), Breathless, The Samourai, Army of Shadows (French), Nargess (Iran), Chung King Express (Hong Kong).
Monday 5-7 [screening], MW170, and 7-10 pm [lecture], HW215
Prof. G. Leonard

2. Major Program Changes:

MAJOR PROGRAM IN HUMAN BIOLOGY

Department of Biological Sciences
[New Program where a Specialist Program already exists]

- *Academic rationale:*

Biological Sciences already offers a Human Biology Specialist Program. We are proposing to create a Human Biology Major Program while also retaining the Specialist Program. The Major Program will be a "pared-down" version of the specialist program.

The rationale for creating this Major Program are as follows:
1. *Students clearly like "Human Biology". The Human Biology Specialist Program is the most popular Specialist Program offered by the Department of Biological Sciences. In 2009-2010 there were 163 students in this program.*
Our other Specialist Programs has significantly fewer students. For example, Cell and Molecular Biology Specialist (112 students); Cell and Molecular Biology Co-Op Specialist (also 112 students); Conservation Biology Specialist (10 students; program discontinued); Integrative Biology Specialist (55 students); Paramedicine (111 students); Industrial Microbiology (now Applied Microbiology; 42 students). Our Integrative Biology Major (now discontinued and replaced with a "Biology" Major had 376 students while the Biology Minor Program had 280 students.

The Human Biology Program therefore has 47% of the students enrolled in a Biology Specialist Program (excluding Co-op and the Joint UTSC-Centennial College Programs).

2. *The evidence suggests that there is significant student demand for such a program.*
For example, at the St. George campus there are currently 1 725 students registered in the "Human Biology" Major program. This represents 56% of all students enrolled in a "Human-Biology-Related Program".

Their other Human Biology-Related Programs (HMB) or Human Biology Specialist Programs are far less popular. For example, HMB – Genes, Genetics and Biotechnology Major (163 students); HMB - Genes, Genetics and Biotechnology Specialist (88 students); HMB – Global Health Major (114 students); HMB – Global Health Specialist (27 students); HMB – Health and Disease Major (383 students); HMB – Health and Disease Specialist (162 students); HMB – Health Care Ethics Major (33 students); HMB – Human Behavioural Biology Specialist (4 students); HMB – Neuroscience Major (249 students); HMB – Neuroscience Specialist (135 students).

3. *This program would offer an appropriate Major-Major pairing for students taking a Health Studies Major.*
Currently students in many other major programs pair that major with a biology major ("Integrative Biology Major" in the past; "Biology Major" as of 2010-2011). The Health Studies program is currently reorganising to create two new streams: 'Environment and Health' and 'Public Policy and Health'. Although health studies students (and students in other programs) can pair their major with a "Biology Major", we recognise that these

students would like their second major to be "humancentric" both in content and in name. A "Human Biology" major would accomplish both of these goals.

This program would also be highly complementary to students taking a neuroscience or psychology major.

- *Changes to the program description and requirements:*

The proposed major program is a pared-down version of the Human Biology Specialist Program

The proposed Major Program will have 8.5 credits consisting of:
1) 3.0 to 3.5 A-level credits
2) 3.0 to 3.5 B-level credits
3) 1.5 C-level credits
4) 0.5 D-level credits

The Specific Program Requirements are:
1.0 Credit of Biology Introductory Courses
BIOA01H, Introductory Biology: Part I
BIOA02H, Introductory Biology: Part II

1.0 Credit in Chemistry Introductory Courses
CHMA10H, Introductory Chemistry I: Structure and Bonding
CHMA11H, Introductory Chemistry II: Reactions and Mechanisms

1.0 Credit in Introductory Psychology Courses
PSYA01H, Introductory Psychology: Part I
PSYA02H, Introductory Psychology: Part II

0.5 Credit in Calculus or Statistics
Choose From:
MATA30H, Calculus I
STAB22H, Statistics I
PSYB07H, Data Analysis in Psychology

2.5 Credits of Biology Core Courses
BIOB10H, Cell Biology
BIOB11H, Molecular Aspects of Cellular and Genetic Processes
BIOB30H, Mammalian Physiology I
BIOB50H, Ecology
BIOB51H, Evolutionary Biology

0.5 Credit in a Biology Core Lab
BIOB33H, Human Development and Anatomy

1.5 Credits of Additional C-Level Courses
Choose From:
BIOC15H, Genetics
BIOC16H, Evolutionary Genetics and Genomics
BIOC17H, Microbiology: The Bacterial Cell
BIOC19H, Animal Developmental Biology
BIOC21H, Vertebrate Histology: Cells and Tissues
BIOC33H, Mammalian Physiology II: Lecture and Laboratory OR BGYC34, Mammalian Physiology II: Lecture
BIOC58H, Biological Consequences of Global Change
BIOC65H, Environmental Toxicology
NROC61H, Learning and Motivation
NROC64H, Sensory and Motor Systems
NROC69H, Synaptic Organisation and Physiology of the Brain

0.5 Credit of Additional D-Level Biology Courses
Choose From:
BIOD17H, Seminars in Cellular Microbiology
BIOD26H, Fungal Biology and Pathogenesis
BIOD29H, Pathobiology of Human Disease
BIOD33H, Comparative Environmental Physiology
BIOD43H, Exercise Physiology
BIOD65H, Pathologies of the Nervous System
BIOD95H, Supervised Study in Biology (topic must be human-related and approved by the program supervisor)
NROD66H, Drug Addiction
NROD67H, Psychobiology of Aging

The proposed major program differs from the specialist program in the following ways:

i. Number of Credits: Specialist, 15.5; Major 8.5
ii. First Year Math: Specialist, 1.0 credit; Major, 0.0 to 0.5 credit
iii. First Year Physics: Specialist, 1.0 credit; Major, 0.0 credit
iv. Second Year Biology: Specialist, 3.0 credits; Major, 2.5 credits (missing BIOB31H, plant physiology)
v. Second Year Biology Labs: Specialist, BIOB32H and BIOB33H: Major, BIOB33H
vi. Second Year Organic Chemistry: Specialist, 1.0 credit: Major, 0.0 credit
vii. C-Level Biology Courses: Specialist, 3.5 credits; Major, 1.5 credits
viii. D-Level Biology Courses: Specialist, 1.0 credits; Major, 0.5 credits
ix. Statistics: Specialist, 0.5 credits; Major, 0.0 to 0.5 credit
x. Psychology: Specialist; 1.5 credits; Major, 1.0 credits

- *Changes to the learning outcomes of the program:*

The learning outcomes are similar to those of the Human Biology Specialist Program with the obvious difference being the extent of topics covered in a major versus a specialist program. This program will expose students to introductory, core and foundational courses in areas of direct relevance to human biology (i.e., anatomy, histology, endocrinology, physiology, psychology, and pathobiology). The program is well-suited for students who

wish to go onto health-related fields such as medicine, dentistry, nursing, pharmacy, physiotherapy and health policy/management or graduate studies in these, and other, areas such as physiology, medicine and endocrinology.

- *Affect on other programs or departments and consultation:*

The proposed changes may affect the current "Biology Major" program. We anticipate that a number of students who are taking the existing major will switch into the Human Biology Major. Many students in Biology have a significant interest in health-related fields. Many come to university with the expectation that they will eventually go to medical school. As such, we anticipate that many students will switch from one biology major to the other. However, we do not see this as being detrimental in any way to the overall structure of the biology curriculum.

We do not anticipate that this program will affect other departments. However, students in this program will be required to take the following courses in other disciplines:

i. CHMA10H, Introductory Chemistry I: Structure and Bonding
ii. CHMA11H, Introductory Chemistry II: Reactions and Mechanisms
iii. PSYA01H, Introductory Psychology: Part I
iv. PSYA02H, Introductory Psychology: Part II
v. MATA30H, Calculus I OR STAB22H, Statistics I OR PSYB07H, Data Analysis in Psychology

If a significant number of students are attracted to this program (from sources other than existing biology programs) then it may well be that enrolment in these chemistry, psychology and math courses will increase.

Consultation with Psychology:

Hi John:
In the fall, we will be proposing a Human Biology major program (to complement our existing Human Biology specialist program).

We are proposing that the program would:
1. require PSYA01 and A02
2. list PSYB07 as one of 3 options.
3. List NROC61, NROC64 and NROC69 as part of a bin (of 11 half courses total) in which student must take 3 half courses.
4. List NROD66 and NROD67 as part of a bin (of 9 courses total) in which student must take 1 half course.

Do you think listing these will cause any problems for these courses?
Unfortunately, the big unknown here is how many students the program will attract. My best guess would be 50 NEW students to UTSC per year.
Greg

Hi Greg,
1. and 2. should not cause a problem because these courses of ours already process very large numbers of students.

I am copying Janelle on this so that she can assess the potential for problems in the NRO courses. Janelle, can you let us know?
Best, John

Janelle LeBoutillier wrote:

Greg
I agree with John that 1. and 2. will not cause any problems and also add 3. to the list.

NROD66 is a new course for us this year and I anticipate this will be a popular seminar course. Given you are including it as part of a bin of courses for students to choose from I suggest that it be included for now. If necessary, we can re-evaluate the inclusion of the course once we have more stats on future enrollments.
Cheers, Janelle

Consultation with Mathematics:
Hi Vassos:
In the fall, we will be proposing a Human Biology major program (to complement our existing Human Biology specialist program).

We are proposing that the program would:
1. list MATA30 and STAB22 as two of 3 options (in which student must take one of the three).

Do you think listing these will cause any problems for these courses? Unfortunately, the big unknown here is how many students the program will attract. My best guess would be 50 NEW students to UTSC per year.
Greg

-----Original Message-----
From: Vassos Hadzilacos [mailto:vassos@cs.toronto.edu]
Sent: June 22, 2010 6:58 PM
To: Greg Vanlerberghe
Cc: Mike Evans; Lisa Jeffrey
Subject: Re: Human Biology major

Hi Greg,
Students in your new program are very welcome to the two CMS courses you mentioned. Thank you for the heads-up and for checking with us.
Vassos

Consultation with Chemistry:
From: Greg Vanlerberghe [mailto:gregv@utsc.utoronto.ca]
Sent: Tuesday, June 22, 2010 4:15 PM
To: cormack@utsc.utoronto.ca
Subject: Human Biology major

Hi Don:
In the fall, we will be proposing a Human Biology major program (to complement our existing Human Biology specialist program).

We are proposing that the program would:
1. require CHMA10 and A11
Do you think listing these will cause any problems for these courses? Unfortunately, the big unknown here is how many students the program will attract. My best guess would be 50 NEW students to UTSC per year.
Greg

From: Donald E. Cormack [mailto:cormack@utsc.utoronto.ca]
Sent: June 22, 2010 5:08 PM
To: 'Greg Vanlerberghe'
Subject: RE: Human Biology major

Greg:
Our first year chem is pretty full. However, we do have a commitment to deliver the courses to all who require it. I am pretty confident that we can handle the extra load. However, I am copying this to Wanda to get her thoughts on capacity. As you know we offer both of these courses twice per year. Enrolments are much lower in the second offerings.

There is also a question as to whether a new program will attract new students or just shuffle students from other programs with no net change in overall enrolment. I guess we'll find out!
Don

- *New courses:*

There are no new courses required to mount this program. However, there will be several new courses that come into existence in biology which could be part of this program even though they are not specifically designed for this program.

- *Resources* (e.g. faculty, TA support, teaching space, equipment)**:**

Possibly and probably depending upon the popularity of the program. If the creation of this program simply means that current biology students shift from one biology program to another then there should be no impact on resources. However, if this program attracts students who were not previously in a biology program or taking biology courses then there will almost certainly be a requirement for new resources.

First Year Biology:
Currently we offer BIOA01 in the fall (800 spots) and summer (120 spots) while BIOA02 is offered in the winter (800 spots) and summer (96 spots). Total enrolment in these courses (both semesters combined) was approximately 775 for BIOA01 and 750 for BIOA02. This means that we have space for approximately 145 (920-775) students in BIOA01 and 146 (896-750) in first year biology. If the new program attracts more than this number of students into the first year of the program then additional resources will be required such as an increase in the number of TA hours to support the laboratory sessions. Additional numbers could probably be accommodated by scheduling both lecture sessions for each course (e.g.., BIOA01 LEC01 and BIOA01 LEC02) in AC223. Ideally a new 1000 – 1200 seat lecture theatre should be built on campus.

Second Year Biology:
The following represent our current capacity in the core second year courses that will be in this program:

- BIOB10H: 500 (fall) + 230 (summer; as BIOB10Y) = 730
- BIOB11H: 500 (winter) + 230 (summer; as BIOB10Y) + 70 (summer; as BIOB11H) = 800
- BIOB30H: 500 (fall) + 275 (summer) = 775
- BIOB33H: 144 (fall) + 96 (summer) = 250
- BIOB50H: 500 (winter) = 500
- BIOB51H: 500 (fall) = 500

BIOB10H, cell biology; BIOB11H, molecular aspects of genetic processes; BIOB10Y, cell biology and molecular aspects of genetic processes; BIOB30H, mammalian physiology I; BIOB33H, human anatomy lab; BIOB50H, ecology; BIOB51H, evolution

There should be sufficient excess capacity in BIOB10H, BIOB11H and BIOB30H to handle a reasonable (100-200) influx of new students into these courses. However, course instructors indicate that more TA hours would be required to accommodate greater numbers of students.

However, BIOB33H is at capacity and will require extra lab sections both in the fall and summer to accommodate any new students. This will require additional TA resources.

Both BIOB50H and BIOB51H will require additional resources to accommodate new students. These courses typically have 475-500 students in them in the fall and winter semesters. To accommodate more students they will need to be offered in the summer. This will require stipendiary instructors.

Third Year Biology:
BIOC15H (genetics), BIOC17H (microbiology), BIOC21H (vertebrate histology) and BIOC33H (mammalian physiology II) all have lab components. BIOC15H and BIOC17H are almost always full. These two courses would likely need 1-2 more lab sections (with the associated TAs) to accommodate more students. BIOC33H has room to accommodate about 25 more students. BIOC58H (biological consequences of global change) and BIOC65 (environmental toxicology) both have tutorial sections. Additional students would likely

require additional TA hours to support these tutorials. Any increase in students in our C-level courses will require additional TA hours to support the increase.

Fourth Year Biology:
The demand on fourth year (D-level) courses will increase as the new degree and program requirements come into effect. Almost all of the fourth year (D-level) in biology have limited enrolments of 30-35 students. Any influx of students into a new program would likely require that more D-level courses be made available (come into existence) or that multiple sections of existing courses be offered. More courses and multiple sections of existing courses will require new instructors (faculty or stipendiary instructors).

Overall:
At this stage it is difficult to predict the effect of this new program on resources. If this program does attract a number of new students (i.e., health studies majors) who would otherwise not have taken biology courses then there will be a need for new resources. If the new program simply results in current biology students shifting programs or the lack of a large influx of students who previously did not take biology courses then the need will not exist.

Model for Growth:
Assumption: There will be 200 new students in this program who would not otherwise take biology courses. Further, these 200 students will be evenly distributed over 4 years (50 per year). The impact of 50 new students in each of the years would be as follows:

A-Level: There should be limited impact of 50 new students in first year. Both BIOA01 and BIOA02 have the capacity to absorb an additional 50 students. At most one would expect that 1-2 new TA positions would be required for each of the two courses.

B-Level: BIOB33H is already at capacity. Additional students would likely require two additional lab sections each with a TA. There would also be the requirement of a larger lecture room. BIOB50H and BIOB51H are already at capacity. Since there is no possibility of moving to a larger lecture room to accommodate an increase in students, these courses would presumably have to be offered in the summer. This would require two stipendiary instructors.

C-Level: If one assumes 50 new students in third year then based on a 24 students per TA model, an additional 2 (maybe 3) TA slots would be required for the C-level laboratory/tutorial courses. Since it is difficult to determine which of the 6 C-level courses with labs/tutorials would have the highest jump in enrolment it would be reasonable to assume that 4 new TA slots would be required to accommodate the increase in C-level course enrolment.

D-level: This is difficult to predict as students will often spread their D-level work over two years. Furthermore, we have a number of new D-level courses being offered for the first time in the upcoming 2010-2011 academic year. However, if we assume that there are 50 new students at the D-level in this new program then this could easily require the creation of 1-2 new D-level courses. This will (should) happen naturally with the new neuroscience hire (Patrick McGowan) and also with the upcoming hire in immunology.

Program Supervisor:
The addition of a major program could significantly increase the work of the Human Biology program supervisor. As with all of our programs, additional resources should be allocated to assist with program supervision.

MAJOR PROGRAM IN BIODIVERSITY, ECOLOGY AND EVOLUTION

Department of Biological Sciences

[New Program where a Specialist Program already exists]

- *Academic rationale:*

This major program provides background and training in modern biological approaches to the study of biodiversity, ecology, and evolution. The links between these fields are emphasized, and topics covered range from the structure and function of ecosystems to the evolution of behaviour, morphology, and physiology. These areas of scholarship have significant applications to stewardship, remediation, and education about the natural world. Biological Sciences currently offers a Biodiversity, Ecology & Evolution (BEE) Specialist program that allows a deep education in these areas, but there is a need for a major that would allow students to combine an interest in Biodiversity with other relevant programs.

We anticipate this major will serve those students who wish to combine another area of interest with study in the BEE program. While the specialist program is ideal for those who wish intensive study in this area and is likely to be very successful in time, there are many students who are concerned about current challenges to biodiversity, or who become very interested in Ecology & Evolution through our introductory courses, but do not wish this to be the exclusive focus of their degree. The BEE Major program will better serve such students. Having both the Specialist and Major options available will increase the focus on this area of study at UTSC and help us build towards the critical mass at which word of mouth will draw even more students into both programs. Our goal is to make UTSC a destination of choice for graduating high school students interested in Biodiversity, Ecology & Evolution. This includes everything from the students who, for example, want a career in conservation or eco/evo research (the BEE specialists), to those who want to understand organismal diversity (the BEE major), perhaps in the context of some particular set of abiotic conditions (e.g., combined with a Major in Environmental Science), social conditions (e.g., combined with a Major in Anthropology), or how biodiversity affects human populations (e.g., combined with a Major in Health Studies). Thus this major program is a natural compliment to majors in physical sciences, neuroscience, the humanities and social sciences with a focus on the environment, or human influences on the natural world. Such combined majors will give students a multi-disciplinary basis for understanding current problems of global significance, and will facilitate careers in areas that include research, policy, teaching, or practical applications in these areas.

- *Changes to the program description and requirements:*

The Major program includes 8.5 credits which maintain the 1st and 2nd year core courses that are integral to most of our programs. Our BEE Specialist program requires 4 3rd-year foundation courses (2 in ecology, 2 in evolution & genetics). In this major program, in comparison, students choose 2 of these 4 foundation courses and so can focus their study on the areas that best complement their interests or other program(s). Upper level electives include a range of courses from our BEE Specialist program which includes offerings in ecology, evolution, conservation, behaviour, biodiversity, and physiology.

- *Changes to the learning outcomes of the program:*

The learning outcomes are similar to that for BEE Specialist (in italics below), except that this major will necessarily include in-depth study in fewer areas (e.g., see above re: 3rd year foundation courses):

Goals (in common with the BEE specialist). *The program seeks to create students (1) literate in basic theory in ecology & evolutionary biology underlying an understanding of organismal diversity, (2) with an understanding of and appreciation for the importance of organismal diversity (3) able to educate others in the importance of biodiversity and challenges to biodiversity.* **Change**: an additional goal of the BEE Specialist program is that students will graduate with an appreciation of the range of types of inter-relationships among organisms at varied levels of organization. The BEE major will get an introduction to complex inter-species interactions, but may choose to focus advanced study on the importance of evolutionary history rather than ecological interactions.

Learning objectives*. In addition to the factual knowledge related to the goals of this program, students will learn problem solving based on rigorous application of the scientific method. Students will also graduate with a basic appreciation for the diversity and richness of life on earth, and an understanding of the inter-relationships among species.* **Change**: A significant component of the BEE Specialist program is a mastery of numeracy related to abstract mathematical reasoning inherent in key introductory models in Ecology and/or statistical aspects of Evolutionary Biology. The BEE Major student will receive an introduction to this type of reasoning, but may choose to focus advanced study on application rather than derivation of the models in each field.
Program **goals** and **learning objectives** are to be realized through requiring all BEE Majors to master material in our first and second year core, and by choosing an area of focus in our 3rd year foundation courses. Specialization in areas of interest can then continue through other C and D level electives, or students can satisfy program requirements by choosing courses that bridge ecology, evolution and biodiversity studies to maintain more breadth in their program.

A number of the C and D-level courses will form capstone experiences for BEE Majors, as it does for BEE Specialists and all BEE program students will have preferential admission to these courses. These include:

- C-level: Tropical Marine Ecology and Evolution, Ecology Field Course, Conservation Biology, Animal Behaviour, Biological Consequences of Global Change;
- D-level: Causes & Consequences of Biodiversity, Special Topics in Behavioural Ecology, Spatial Ecology.

- *Affect other programs or departments and consultation:*

BEE major students are required to take some courses offered by other departments. This will cause a small increase the number of students in the following extra-departmental courses (we anticipate about 20 students per year in the program at steady-state). First and second year: CHMA10H, and CHMA11H; MATA30H or STAB22H or PSYB07H Third and fourth year: EESC30H, EESD15H

We have consulted with the chairs of the Depart of Psychology (PSYB07H), Department of Physical and Environmental Sciences (CHMA10H, CHMA11H, EESC30H, EESD15H) and Department of Computer & Mathematical Sciences (MATA30H, STAB22H), all have

confirmed their support for the program and do not anticipate problems with additional enrolment in these courses.

Finally, NROC34H is not a BIO course, but is an elective in a bin with 9 other courses. It is taught by Biological Sciences faculty, and capacity could be expanded in this lecture-only course if needed.

- *New courses:*

None - BEE Specialist program courses are sufficient.

- *Resources (e.g. faculty, TA support, teaching space, equipment):*

No new resources are required to initiate this program, and full time faculty will teach the courses in this program. However, we do anticipate an increased number of students as this program and the BEE Specialist mature, and this may have later implications for TA support. In addition, while full-time faculty teach the core courses in the program, we do not have sufficient depth to ensure such coverage during sabbaticals or other leaves. We are currently advertising for an open-rank professorship in Ecology & Conservation. This will alleviate this problem to some extent and bolster our ability to deliver the program without the use of sessional instructors.

- *Calendar Entry:*

Biodiversity, Ecology and Evolution Major
Supervisor: M. Andrade *E-mail*: biodiversity@utsc.utoronto.ca
This program provides background a nd training in m odern biological approaches to the study of biodiversity, ecology, and evoluti on. The links between these fi elds are em phasized, and topics covered range from the structure and function of ecosystem s to the evolution of behaviour, morphology, and physiology.
Program Requirements This program consists of **8.5** required credits. To complete their degree, students should combine this major program with a major program (or two minor programs) in another discipline. Note however that this program *cannot* be combined with the major program in Human Biology, the major program in Biology or the m inor program in Biology.

First Year
1.0 Credit of Biology Introductory Courses
BIOA01H, Introductory Biology: Part I BIOA02H, Introductory Biology: Part II
1.0 Credit in Chemistry
CHMA10H, Introductory Chemistry I: Structure and Bonding CHMA11H, Introductory Chemistry II: Reactions and Mechanisms
0.5 Credit in Mathematics or Statistics
Choose from: MATA30H, Calculus I STAB22H, Statistics I PSYB07H, Data Analysis in Psychology

Second Year
3.0 Credits of Biology Core Courses
BIOB10H, Cell Biology BIOB11H, Molecular Aspects of Cellular and Genetic Processes BIOB30H, Mammalian Physiology I BIOB31H, Plant Physiology BIOB50H, Ecology

BIOB51H, Evolutionary Biology
0.5 Credit of the Ecology & Evolution Core Lab
BIOB52H, Ecology and Evolutionary Biology Laboratory

Third Year
1.0 Credit of Ecology & Evolution Foundation Courses
Choose from: BIOC16H, Evolutionary Genetics and GenomicsBIOC50H, Macroevolution BIOC59H, Advanced Population Ecology BIOC61H, Community Ecology and Environmental Biology
1.0 Credit of Other C-level Courses
Choose from: BIOC51H, Tropical Marine Ecology and Evolution BIOC52H, Ecology Field Course BIOC54H, Animal Behaviour BIOC58H, Biological Consequences of Global Change BIOC62H, Role of Zoos in Conservation BIOC63H, Conservation Biology BIOC65H, Environmental Toxicology BIOC67H, Advanced Field Course in Ecology EESC30H, Microbial Biogeochemistry NROC34H, Neuroethology

Fourth Year
0.5 Credit of D-level Courses
Choose from: BIOD25H, Genomics BIOD26H, Fungal Biology & Pathogenesis BIOD33H, Comparative Environmental Physiology BIOD43H, Exercise Physiology BIOD45H, Animal Communication BIOD52H, Senior Seminar in Biodiversity and Conservation Biology BIOD53H, Special Topics in Behavioural Ecology BIOD60H, Spatial Ecology BIOD66H, Causes & Consequences of Biodiversity EESD15H, Cleaning Up Our Mess: Remediation of Terrestrial and Aquatic Environments

MAJOR PROGRAM IN PHYSICAL SCIENCES

Department of Physical & Environmental Sciences

- *Updated Program Requirements*:

Total Credits: **8.0**

First Year
PHYA10H Introduction to Physics IA
PHYA21H Introduction to Physics IIA
CHMA10H Introductory Chemistry I: Structure and Bonding
CHMA11H Introductory Chemistry II: Reactions and Mechanisms
MATA30H Calculus I
MATA23H Linear Algebra I
[MATA36H Calculus II for Physical Sciences
or
MATA37H Calculus II for Mathematical Sciences]

Second or Third Year
Five of:
PHYB10H Intermediate Physics Laboratory I
PHYB21H Electricity and Magnetism
PHYB52H Thermal Physics
PHYB54H Mechanics: From Oscillations to Chaos
PHYB56H Introduction to Quantum Physics
MATB24H Linear Algebra II
MATB41H Techniques of the Calculus of Several Variables I
MATB42H Techniques of the Calculus of Several Variables II
MATB44H Differential Equations I
ASTB23H Astrophysics of Stars, Galaxies and the Universe
CHMB20H Chemical Thermodynamics and Elementary Kinetics
CHMB21H Chemical Structure and Spectroscopy
STAB22H Statistics I

Third or Fourth Year
Four of:
ASTC25H Astrophysics of Planetary Systems
MATC34H Complex Variables
MATC46H Differential Equations II
PHYC50H Electromagnetic Theory
PHYC56H Quantum Mechanics I
PHYC11H Intermediate Physics Laboratory II
PHYC54H Classical Mechanics
PHYD37H Introduction to Fluid Mechanics
PHYD38H Nonlinear Systems and Chaos
PSCB57H Introduction to Scientific Computing
PSCD02H Current Questions in Mathematics and Science
[PHYD01H Physics Research Project

or
PHYD11H Computational Physics Project
or
PHYD72H Supervised Reading in Physics
or
ASTD01H Astrophysics Research Project
or
ASTD02H Supervised Reading in Astrophysics
or
PSCD10H Physical Sciences Project]

- *New courses*:

ASTD02H3 Supervised Reading in Astrophysics
Course description:
An individual study program chosen by the student with the advice of, and under the direction of, a faculty member. A student may take advantage of this course either to specialize further in a field of interest or to explore interdisciplinary fields not available in the regular syllabus.

Breadth Category: Natural Sciences
Exclusions: AST425
Pre-requisites: 14.0 completed FCEs, cumulative GPA of at least 2.5, and permission from the coordinator.
Co-requisites: None
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Each term
Additional Resources Required: None
Note: research course – no teaching load

Department's Academic Rationale:
The student will research and perform readings on some topic or areas of current interest in astronomy and astrophysics, and write a report on his or her work. The student is expected to gain an appreciation of the current state of knowledge about the selected topic, and to become familiar with the current state of research in the selected areas. The topic or areas will be selected by one of the instructors or professorial faculty member in consultation with the student.

Students must obtain consent from the supervising instructor before registering for this course.

A typical assessment scheme might be:
- Midterm Proposal / Report 20%
- Weekly Meetings Performance 20%
- Final Report 30%
- Final Presentation 30%

PHYB54H3 Mechanics: From Oscillations to Chaos

Course description:
The linear, nonlinear and chaotic behaviour of classical mechanical systems such as oscillators, rotating bodies, and central field systems. The course will develop analytical and numerical tools to solve such systems and determine their basic properties. The course will include mathematical analysis, numerical exercises (Python), and demonstrations of mechanical systems.

Breadth Category: Natural Sciences
Exclusions: PHY254
Pre-requisites: PHYA21, MATB41, MATB44
Co-requisites: MATB42
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Yearly
Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.
Note: Course to be taught by lecturer (varies year to year)

Department's Academic Rationale:
Oscillations are a recurring theme in a wide variety of natural phenomena. The study of ideal mechanical oscillations forms the starting point of this course. Moving from ideal to real situations will lead from linear systems into the nonlinear and chaotic regimes. Analytical tools as well as numerical computational tools (Python) integrated into the course allow for the exploration and study of complex oscillatory and nonlinear mechanical examples.

This course significantly updates the previous course in Oscillations and Waves into more current topics and techniques used in the analysis of mechanical systems. Numerical tools will aid in the study of nonlinear and chaotic systems, as well as the traditional systems that admit analytical solutions.

By the end of this course, students will develop the analytical and numerical tools necessary for the study of generic oscillatory systems, their properties and main characteristics, with emphasis on examples from classical mechanics. With help from numerical modeling, by the end of the course, students will learn the main characteristics and phenomenology of nonlinear and chaotic systems.

A typical assessment scheme might be:

- Assignments (Analytical and Numerical) 25%
- Midterm Test 30%
- Final Exam 45%

PHYB56H3 Introduction to Quantum Physics

Course description:

The course introduces the basic concepts of Quantum Physics and Quantum Mechanics starting with the experimental basis and the properties of the wave function. Schrödinger's equation will be introduced with some applications in one dimension. Topics include Stern-Gerlach effect; harmonic oscillator; uncertainty principle; interference packets; scattering and tunnelling in one-dimension.

Breadth Category: Natural Sciences
Exclusions: PHY256
Pre-requisites: PHYA21, MATA36
Co-requisites: MATB41
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Yearly
Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.
Note: Course to be taught by lecturer (varies year to year)

Department's Academic Rationale:

This is a first course in quantum physics and quantum mechanics. The main goal is to help students to achieve an understanding of basic quantum mechanics that will enable them to solve simple problems and prepare them for study in the more advanced course PHYC56 "Quantum Mechanics I".

A tentative schedule of topics to be discussed:

1. Planck's Blackbody Radiation Theory
2. Photoelectric and Compton Effects
3. Bohr's Model of the Atom and De Broglie's Waves
4. Schrodinger's Equation and Wave Functions
5. Uncertainty Principle
6. Square Potential Wells
7. The Free Particle, Potential Barriers, and Tunneling
8. Delta Potential and Scattering
9. Finite Square Well
10. Quantum Harmonic Oscillator

A typical assessment scheme might be:

- Assignments and Quizzes 25%
- Midterm Test 30%
- Final Exam 45%

PHYC50H3 Electromagnetic Theory
Course description:
Solving Poisson and Laplace equations via method of images and separation of variables, Multipole expansion for electrostatics, atomic dipoles and polarizability, polarization in dielectrics, Ampere and Biot-Savart laws, multipole expansion in magnetostatics, magnetic dipoles, magnetization in matter, Maxwell's equations in matter.

Breadth Category: Natural Sciences
Exclusions: PHY350
Pre-requisites: PHYB54, PHYB21, MATA23, MATB42, MATB44
Co-requisites: None
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Yearly
Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.
Note: Course to be taught by existing faculty or by new hire

Department's Academic Rationale:
This course builds on the electromagnetism basics presented in the previous course PHYB21. We start with a review of vector and tensor calculus, the transformation properties of vectors and tensors, electrostatics, and the basic formulae of magnetostatics. Then more advanced topics in electrodynamics (Maxwell's Equations), gauge transformations of scalar and vector potentials, retarded potentials, Lienard-Wiechert potentials, and radiation will be discussed. Throughout the course we will be incorporating and developing the special theory of relativity, relativistic mechanics and relativistic electrodynamics.

A typical assessment scheme might be:
- Assignments and Quizzes 25%
- Midterm Test 30%
- Final Exam 45%

PHYC54H3 Classical Mechanics
Course description:
A course that will concentrate in the study of symmetry and conservation laws, stability and instability, generalized co-ordinates, Hamilton's principle, Hamilton's equations, phase space, Liouville's theorem, canonical transformations, Poisson brackets, Noether's theorem.

Breadth Category: Natural Sciences
Exclusions: PHY354
Pre-requisites: PHYB54, MATB44
Co-requisites: None
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Yearly
Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.
Note: Course will be taught by existing faculty or by new hire

Department's Academic Rationale:
This course presents the formalism of Lagrangian and Hamiltonian Mechanics, core subjects in any Physics degree.

The theories and techniques explored in this course are essential to continue studies in physics in all other areas be it electromagnetic theory, quantum mechanics, fluid dynamics, etc.

A schedule of topics to be discussed:
1. Euler-Lagrange Equations and Least Action Principle
2. Symmetries and Conservation Laws
3. Angular Momentum and Central Field Motion
4. Similarity and the Virial Theorem
5. Scattering Cross-Section
6. Rigid Body Motion
7. Noninertial Reference Frames
8. Hamilton's Equations and Poisson Brackets

A typical assessment scheme might be:
- Assignments and Quizzes 25%
- Midterm Test 30%
- Final Exam 45%

PHYC56H3 Quantum Mechanics I
Course description:
The course builds on the basic concepts of quantum theory students learned in PHYB56. Topics include the general structure of wave mechanics; eigenfunctions and eigenvalues; operators; orbital angular momentum; spherical harmonics; central potential; separation of variables; hydrogen atom; Dirac notation; operator methods; harmonic oscillator and spin.

Breadth Category: Natural Sciences
Exclusions: PHY356
Pre-requisites: PHYB56, PHYB21, MATA23, MATB42, MATB44
Co-requisites: None
Recommended preparation: None

Limited enrolment: None
Frequency of course offering: Yearly
Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.

Note: Course will be taught by existing faculty (likely J. Bayer)

Department's Academic Rationale:
Building on the basics of quantum mechanics presented in the previous course, we start with the mathematical formalism of wave mechanics and the Dirac notation. Hilbert space theory is then used to study the problem of the quantum harmonic oscillator, and the general problem of angular momentum and central potentials. This will lead to a solution for the problem of the hydrogen atom. As a final topic we will study spin wave functions.

By the end of this course students will be proficient in the use of the methods of wave and matrix mechanics for the study and understanding of quantum mechanical systems.

After introducing the axiomatic formalism of quantum mechanics, students will be able to describe quantum mechanical systems in terms of the basic postulates and how these relate to the problem of measurements within the quantum paradigm.

A schedule of topics to be discussed:
1. Inner Product Spaces; Bras and Kets; Operators
2. Eigenvalues; Functions of Operators; Infinite-Dimensional Spaces
3. Postulates of Quantum Mechanics; Measurements; Time Evolution
4. Uncertainty Principle; Review of 1D Problems
5. The Quantum Harmonic Oscillator
6. Symmetries and Parity
7. Multiple Degrees of Freedom
8. Angular Momentum and Spherical Harmonics
9. Rotational Invariance; The Hydrogen Atom
10. Spin Mechanics

A typical assessment scheme might be:
- Assignments and Quizzes 25%
- Midterm Test 30%
- Final Exam 45%

PHYD01H3 Physics Research Project
Course description:
Introduces students to current research in physics under the supervision of a professorial faculty member. Students undertake an independent project involving theoretical or experimental Physics. Evaluation is by the supervising faculty member in consultation with course supervisor. Students must obtain consent of the course supervisor to enrol in this course.

Breadth Category: Natural Sciences
Exclusions: PHY478
Pre-requisites: 14.0 completed FCEs, cumulative GPA of at least 2.5, and permission from the coordinator
Co-requisites: None
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Each term
Additional Resources Required: None
Note: Research course – no teaching load

Department's Academic Rationale:
The student will research on some topic of current interest in physics and write a report on his or her work. The student is expected to gain an appreciation of the current state of knowledge about a particular topic of physical interest, and to become familiar with the basic methods of research. The topic will be selected by one of the instructors or professorial faculty member in consultation with the student.

Students must obtain consent from the supervising instructor before registering for this course.

A typical assessment scheme might be:

- Midterm Proposal / Report 20%
- Weekly Meetings Performance 20%
- Final Report 30%
- Final Presentation 30%

PHYD11H3 Computational Physics Project
Course description:
Introduces students to current research topics in computational physics under supervision of a professorial faculty member. Students undertake independent project involving computational Physics. Evaluation by the supervising faculty member in consultation with

the course supervisor. Students must obtain the consent of the course supervisor to enrol in this course.

Breadth Category: Natural Sciences
Exclusions: PHY478
Pre-requisites: 14.0 completed FCEs, cumulative GPA of at least 2.5, and permission from the coordinator
Co-requisites: None
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Each term
Additional Resources Required: None
Note: Research course – no teaching load

Department's Academic Rationale:
The student will research on some topic of current interest in computational physics and write a report on his or her work. The student is expected to gain an appreciation of the current state of knowledge about a particular topic of physical interest, and to become familiar with the basic methods of research in computational physics. The topic will be selected by one of the instructors or professorial faculty member in consultation with the student.

Students must obtain consent from the supervising instructor before registering for this course.

A typical assessment scheme might be:

- Midterm Proposal / Report 20%
- Weekly Meetings Performance 20%
- Final Report 30%
- Final Presentation 30%

PHYD37H3 Introduction to Fluid Mechanics
Course description:
Description and understanding of the dynamics of fluid systems. Topics covered include the idea of continuum, total derivative, equations for mass and energy conservation, Navier-Stokes equations; introduces tensor notation; stream function, streamlines, trajectories, rate of strain, vorticity; viscous fluids, non-Newtonian rheologies; Bernoulli's equation, channel flow, turbulence, Reynold's number.

Breadth Category: Natural Sciences
Exclusions: PHY454
Pre-requisites: PHYC54
Co-requisites: None
Recommended preparation: None

Limited enrolment: No

Frequency of course offering: Yearly
Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.
Note: Course to be taught by existing faculty or by new hire

Department's Academic Rationale:
This course builds from the previous courses in mechanics to introduce the tools for the study of fluid mechanics, both analytically and through numerical techniques.

The theories and techniques explored in this course will prepare students for later research in a wide variety of fields where knowledge of the mechanics of fluids plays an essential role.

A typical assessment scheme might be:

- Assignments and Quizzes 25%
- Midterm Test 30%
- Final Exam 45%

PHYD38H3 Nonlinear Systems and Chaos
Course description:
The theory of nonlinear dynamical systems with applications to many areas of physics and astronomy. Topics include stability, bifurcations, chaos, universality, maps, strange attractors and fractals. Geometric, analytical and computational methods will be developed.

Breadth Category: Natural Sciences
Exclusions: PHY460
Pre-requisites: PHYC54
Co-requisites: None
Recommended preparation: None

Limited enrolment: None
Frequency of course offering: Yearly

Additional Resources Required: No special equipment. TA support will be needed to run one-hour weekly tutorials meeting in groups of 20 students to discuss problems and conceptual questions.
Note: Course to be taught by existing faculty or by new hire

Department's Academic Rationale:
This course is an introduction to nonlinear physics, fractals and chaotic systems. We study both Hamiltonian and dissipative systems. The ordered and chaotic (deterministic and non-deterministic) regimes will be discussed, in both finite-dimensional and continuous systems. The key principles are illustrated through the analysis of examples from: fluid dynamics, dynamical astronomy, econophysics, and other disciplines.

Topics will include (not necessarily all of) the following:
1. Fluid instabilities: Rayleigh-Benard convection
2. Stability and bifurcation
3. Landau amplitude equation
4. Multiple timescale perturbation theory
5. Lorenz equations and the modeling of weather
6. Nonlinear differential equations and fixed point analysis
7. Chaos, chaotic attractors
8. Hamiltonian chaos
9. Poincare sections
10. KAM theorem and Poincare-Birkhoff theorem
11. KdV equation and solitons
12. Fractals and cellular automata
13. Non-integrable N-body problems in astronomy
14. Orbital resonance and the stability in planetary and galactic systems
15. Random walk in financial markets
16. Time series analysis and modelling

A typical assessment scheme might be:

- Assignments 35%
- Midterm Test 20%
- Final Exam 40%
- Student project 15%

PHYD72H3 Supervised Reading in Physics

Course description:
An individual study program chosen by the student with the advice of, and under the direction of, a faculty member. A student may take advantage of this course either to specialize further in a field of interest or to explore interdisciplinary fields not available in the regular syllabus.

Breadth Category: Natural Sciences
Exclusions: PHY372, PHY472
Pre-requisites: 14.0 completed FCEs, cumulative GPA of at least 2.5, and permission from the coordinator
Co-requisites: None
Recommended preparation: None

Limited enrolment: No
Frequency of course offering: Each term
Additional Resources Required: None
Note: Research Course – no teaching load

Department's Academic Rationale:
The student will research and perform readings on some topic or areas of current interest in physics, and write a report on his or her work. The student is expected to gain an appreciation of the current state of knowledge about the selected topic, and to become

familiar with the current state of research in the selected areas. The topic or areas will be selected by one of the instructors or professorial faculty member in consultation with the student.

Students must obtain consent from the supervising instructor before registering for this course.

A typical assessment scheme might be:

- Midterm Proposal / Report 20%
- Weekly Meetings Performance 20%
- Final Report 30%
- Final Presentation 30%

- *Department's Academic Rationale for Major Program Change*:

Adjustments were made to comply with the total FCE requirements as well as the FCE requirements for C and D level courses. A number of B, C, and D level courses were added to provide a complete formation for the major. The name change is proposed to align this program with the corresponding Specialist program.

- *Changes to Learning Outcomes*: None

- *Affect on other UTSC Academic Departments*: None

- *Consultation with other UTSC Academic Departments*: Yes

- *Resources*:

To properly offer this program and the corresponding C- and D-level courses listed, new research stream faculty must be appointed to teach the higher level courses as well as provide research project opportunities for the students. Similarly, with the addition of new courses, TA support will be needed as required by the student enrolment in the different courses.

MAJOR PROGRAM IN ASTROPHYSICS AND PHYSICS

Department of Physical & Environmental Sciences

- *New Program title*: **Major in Physics and Astrophysics**
- *Updated Program Requirements*:

Total Credits: **8.5**

First Year
PHYA10H Introduction to Physics IA
PHYA21H Introduction to Physics IIA
MATA30H Calculus I
MATA23H Linear Algebra I
[MATA36H Calculus II for Physical Sciences
or
MATA37H Calculus II for Mathematical Sciences]

Second and Later Years
ASTB23H Astrophysics of Stars, Galaxies and the Universe
MATB41H Techniques of the Calculus of Several Variables I
MATB42H Techniques of the Calculus of Several Variables II
MATB44H Differential Equations I
PHYB10H Intermediate Physics Laboratory I

Three of:
PHYB56H Introduction to Quantum Physics
PHYB21H Electricity and Magnetism
PHYB52H Thermal Physics
PHYB54H Mechanics: From Oscillations to Chaos

A total of 2.0 credits from:
ASTC25H Astrophysics of Planetary Systems
MATC34H Complex Variables
MATC46H Differential Equations II
PHYC50H Electromagnetic Theory
PHYC56H Quantum Mechanics I
PHYC11H Intermediate Physics Laboratory II
PHYC54H Classical Mechanics
PHYD37H Introduction to Fluid Mechanics
PHYD38H Nonlinear Systems and Chaos
PSCB57H Introduction to Scientific Computing
PSCD02H Current Questions in Mathematics and Science
[PHYD01H Physics Research Project
or
PHYD11H Computational Physics Project
or
PHYD72H Supervised Reading in Physics
or

ASTD01H Astrophysics Research Project
or
ASTD02H Supervised Reading in Astrophysics
or
PSCD10H Physical Sciences Project]

- *New Courses*: As per Major Program in Physical Sciences

- *Department's Academic Rationale for Major Program Change*:

Basic Astronomy courses were removed to include more relevant courses for this major program. This will also enable our students to pursue a wider range of higher-level courses. The Astronomy courses removed are of a level that is not consistent with the major program.

Adjustments were made to comply with the total FCE requirements as well as the FCE requirements for C and D level courses. A number of B, C, and D level courses were added to provide a complete formation for the major.

The proposed changes will improve all other programs in Physics and Astrophysics through the addition of new courses and better structure in the sequence of pre- and co-requisites.

- *Changes to Learning Outcomes*: None

- *Affect on other UTSC Academic Departments*: None

- *Consultation with other UTSC Academic Departments*: Yes.

- *New Resources*:

To properly offer this program and the corresponding C- and D-level courses listed, new research stream faculty must be appointed to teach the higher level courses as well as provide research project opportunities for the students. Similarly, with the addition of new courses, TA support will be needed as required by the student enrolment in the different courses.

SPECIALIST PROGRAM IN PHYSICAL AND MATHEMATICAL SCIENCES
Department of Physical & Environmental Sciences

- *Updated Program Requirements*:

Total Credits: **15.5**

First Year
PHYA10H Introduction to Physics IA
PHYA21H Introduction to Physics IIA
CHMA10H Introductory Chemistry I: Structure and Bonding
CHMA11H Introductory Chemistry II: Reactions and Mechanisms
MATA30H Calculus I
MATA23H Linear Algebra I
[MATA36H Calculus II for Physical Sciences
or
MATA37H Calculus II for Mathematical Sciences]

Second Year
PHYB10H Intermediate Physics Laboratory I
PHYB56H Introduction to Quantum Physics
PHYB21H Electricity and Magnetism
PHYB52H Thermal Physics
MATB24H Linear Algebra II
MATB41H Techniques of the Calculus of Several Variables I
MATB42H Techniques of the Calculus of Several Variables II
MATB44H Differential Equations I

Second or Third Year
PHYB54H Mechanics: From Oscillations to Chaos
ASTB23H Astrophysics of Stars, Galaxies and the Universe
CHMB20H Chemical Thermodynamics and Elementary Kinetics
CHMB21H Chemical Structure and Spectroscopy
MATB61H Linear Programming and Optimization
PSCB57H Introduction to Scientific Computing
CSCB58H Computer Organization
STAB57H An Introduction to Statistics

Third or Fourth Year
A total of 4.0 credits from:
ASTC25H Astrophysics of Planetary Systems
MATC34H Complex Variables
MATC46H Differential Equations II
PHYC50H Electromagnetic Theory
PHYC56H Quantum Mechanics I
PHYC11H Intermediate Physics Laboratory II
PHYC54H Classical Mechanics

PHYD37H Introduction to Fluid Mechanics
PHYD38H Nonlinear Systems and Chaos
[CSCC36H Numerical Methods
or
[CSCC50H Numerical Algebra and Optimization *and*
CSCC51H Numerical Approximation, Integration and Ordinary Differential Equations]]
PSCD02H Current Questions in Mathematics and Science
[PHYD01H Physics Research Project
or
PHYD11H Computational Physics Project
or
PHYD72H Supervised Reading in Physics
or
ASTD01H Astrophysics Research Project
or
ASTD02H Supervised Reading in Astrophysics
or
PSCD10H Physical Sciences Project]

- *New Courses*: As per Major Program in Physical Sciences

- *Department's Academic Rationale*:

Adjustments were made to comply with the total FCE requirements as well as the FCE requirements for C and D level courses. A number of B, C, and D level courses were added to provide a complete formation for the specialist.

This program is popular with CTEP students and provides at least two teachables.

- *Changes to Learning Outcomes*: None

- *Affect on other UTSC Academic Departments*: None

- *Consultation with other UTSC Academic Departments*: Yes

- *New Resources*:

To properly offer this program and the corresponding C- and D-level courses listed, new research stream faculty must be appointed to teach the higher-level courses as well as provide research project opportunities for the students. Similarly, with the addition of new courses, TA support will be needed as required by the student enrolment in the different courses.

SPECIALIST PROGRAM IN PHYSICS AND ITS APPLICATIONS

Department of Physical & Environmental Sciences

- *New Program title*: **Specialist in Physics and Astrophysics**
- *Updated Program Requirements*:

Total Credits: **13.0**

First Year
PHYA10H Introduction to Physics IA
PHYA21H Introduction to Physics IIA
MATA30H Calculus I
MATA23H Linear Algebra I
[MATA36H Calculus II for Physical Sciences
or
MATA37H Calculus II for Mathematical Sciences]

Second and Later Years
ASTB23H Astrophysics of Stars, Galaxies and the Universe
PHYB10H Intermediate Physics Laboratory I
PHYB56H Introduction to Quantum Physics
PHYB21H Electricity and Magnetism
PHYB52H Thermal Physics
PHYB54H Mechanics: From Oscillations to Chaos
MATB41H Techniques of the Calculus of Several Variables I
MATB42H Techniques of the Calculus of Several Variables II
MATB44H Differential Equations I

Third Year
PHYC50H Electromagnetic Theory
PHYC56H Quantum Mechanics I
PHYC11H Intermediate Physics Laboratory II
PHYC54H Classical Mechanics
PSCB57H Introduction to Scientific Computing
MATC34H Complex Variables
MATC46H Differential Equations II

Fourth Year
Three of:
ASTC25H Astrophysics of Planetary Systems
PHYD37H Introduction to Fluid Mechanics
PHYD38H Nonlinear Systems and Chaos
PHY452H Basic Statistical Mechanics
PHY456H Quantum Mechanics II
PHY483H Relativity Theory I
PHY484H Relativity Theory II
PHY487H Condensed Matter Physics

PHY489H Introduction to High Energy Physics
PHY491H Current Interpretations of Quantum Mechanics
PHY492H Advanced Atmospheric Physics
PHY493H Geophysical Imaging I
PHY494H Geophysical Imaging II
PHY495H Experimental Global Geophysics
PHY496H Experimental Applied Geophysics

One of:
PHYD01H Physics Research Project
PHYD11H Computational Physics Project
PHYD72H Supervised Reading in Physics
ASTD01H Astrophysics Research Project
ASTD02H Supervised Reading in Astrophysics
PSCD10H Physical Sciences Project

One additional 0.5 credit from a course in AST or PHY at the C-, D-, 300-, or 400-level, including:
PSCD02H Current Questions in Mathematics and Sciences

- *New Courses*: As per Major Program in Physical Sciences

- *Department's Academic Rationale*:

In the past, the specialist programs have required students to take a significant number of courses at the St. George campus. With the new structure of the program, students will have the possibility of completing all the program requirements at the Scarborough campus.

The existing streams have been eliminated to introduce a single unified and more coherent program.

The program offers a course selection that matches the research goals within our department and will enable our students to conduct senior-level research projects and directed reading courses.

Adjustments were made to comply with the total FCE requirements as well as the FCE requirements for C and D level courses.

Basic Astronomy courses were removed to include more relevant courses for this specialist program. This will also enable our students to pursue a wider range of higher-level courses. The Astronomy courses removed are of a level that is not consistent with the specialist program.

A number of B, C, and D level courses were added to provide a complete formation for the specialist.

- *Changes to Learning Outcomes*: No major changes

- *Affect on other UTSC Academic Departments*: None

- *Consultation with other UTSC Academic Departments*: Yes

- *New Resources*:

To properly offer this program and the corresponding C- and D-level courses listed, new research stream faculty must be appointed to teach the higher-level courses as well as provide research project opportunities for the students. Similarly, with the addition of new courses, TA support will be needed as required by the student enrolment in the different courses.

3. Program Deletions:

SPECIALIST PROGRAM IN NATURAL SCIENCES

Department of Computer and Mathematical Sciences

- *Program Closure Dates:*
  - New Admissions: 2011-12 Academic Year
  - Full closure anticipated for 2013-14/2015-16

- *Academic Rationale:*

There are currently only 5 students enrolled in this program in all years and the largest enrolment has only been 10. There is not enough demand to continue this program.

- *Consultation with other Departments:*

This has been discussed with Prof. C. Dyer in the Department of Physical and Environmental Sciences at UTSC and he has indicated that DPES is in agreement with this proposal.

- *Current Enrolment:*

The current enrolment is 5. These students can complete the program as no courses will be discontinued.

- *Where will students go?:*

Such students will do a double major or instead follow the Specialist in Physical and Mathematical Sciences.

- *What is the impact, if any, on faculty and staff?:*

None

SPECIALIST (CO-OP) PROGRAM IN ANTHROPOLOGY

Department of Social Sciences

- *Program Closure Dates:*
  - New Admissions: 2011-12 Academic Year
  - Full closure anticipated for 2013-14/2015-16

- *Academic Rationale:*

This program has had persistently low enrolments since 2003 (in order by year, 4, 2, 4, 3, 2, 5, 4 students). It has been difficult to find suitable placements for students (the Director of Arts and Science Coop Programs has confirmed this). The faculty in Anthropology have not been actively interested in the program and there is no classroom component in Anthropology programs that relates to it.

- *Consultation with other UTSC Departments:*

It has been discussed in general terms with the Director of Arts and Science Coop, and with the Vice-Dean undergraduate, . Withdrawing the program for 2011-12, will allow time to develop alternative strategies for Coop in Social Sciences. There is a strong sense that it is preferable to act now rather than to let small and poorly supported Coop programs linger on.

- *Current Enrolment:*

The students in the program will be accommodated until graduation. The deletion will mean that no new registrations will be permitted for 2011-12.

- *Where will students go?:*

The Coop program in Social Sciences (which is what is identified on the OUAC form) will continue, as will those in Health Studies, IDS, City Studies, and Public Policy. Students interested in a Coop program in Social Sciences may will still have the possibility to connect it with a Specialist in Sociology, but this is not predetermined. This arrangement should give much greater flexibility in connecting students with suitable placements – and it could be that good placements could direct students into related academic programs.

- *What is the impact, if any, on faculty and staff?:*

None

SPECIALIST (CO-OP) PROGRAM IN SOCIOLOGY

Department of Social Sciences

- *Program Closure Dates:*
  - New Admissions: 2011-12 Academic Year
  - Full closure anticipated for 2013-14/2015-16

- *Academic Rationale:*

This program has had persistently low enrolments since 2003 (in order by year, 7, 7, 8, 13, 10, 8, 10 students). It has been difficult to find suitable placements for students (the Director of Arts and Science Coop Programs has confirmed this). The faculty in Sociology have not been actively interested in the program and there is no classroom component in Sociology programs that relates to it.

- *Consultation with other UTSC Departments:*

It has been discussed in general terms with the Director of Arts and Science Coop, and with the Vice-Dean undergraduate. Withdrawing the program for 2011-12, will allow time to develop alternative strategies for Coop in Social Sciences. There is a strong sense that it is preferable to act now rather than to let small and poorly supported Coop programs linger on.

- *Current Enrolment:*

The students in the program now will be accommodated until graduation. The deletion will mean that no new registrations will be permitted for 2011-12.

- *Where will students go?:*

The Coop program in Social Sciences (which is what is identified on the OUAC form) will continue, as will those in Health Studies, IDS, City Studies, and Public Policy. Students interested in a Coop program in Social Sciences may will still have the possibility to connect it with a Specialist in Sociology, but this is not predetermined. This arrangement should give much greater flexibility in connecting students with suitable placements – and it could be that good placements could direct students into related academic programs.

- *What is the impact, if any, on faculty and staff?:*

None