
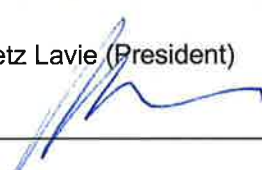




Application for Registration of a New Program¹

This application is for New York degree-granting institutions seeking to register a new program that is below the doctoral level. Save this file, enter the requested information, and submit to the State Education Department.

- Proposals for new distance education, teacher certification, educational leadership certification, and professional licensure programs may require additional information, in addition to this core application.
- Certificate and advanced certificate proposals: use the certificate forms at www.highered.nysed.gov/ocue/. This expedited option is not available for teacher, educational leader, or professional certification/licensure programs.

Item	Response (type in the requested information)
Program type <i>Check program type(s)</i>	<input checked="" type="checkbox"/> General academic program <input type="checkbox"/> Program to prepare certified teachers or certified educational leaders <input type="checkbox"/> Program to prepare licensed professionals
Institution name and address	Cornell NYC Tech, 111 Eighth Avenue, New York, NY 10011 <i>Additional information:</i> <ul style="list-style-type: none"> Specify campus where program will be offered, if other than the main campus: If any <i>courses</i> will be offered off campus, indicate the location and number of courses and credits:
3) Program title, award, credits, and proposed HEGIS code	Program title: Information Systems (Cornell) and Applied Information Sciences (Technion) <u>Award</u> (e.g., B.A., M.S.): MS Credits: 60 Proposed HEGIS code:
Program format	Check all program scheduling and format features that apply: (See definitions) i) Format: <input checked="" type="checkbox"/> Day <input type="checkbox"/> Evening <input type="checkbox"/> Weekend <input type="checkbox"/> Evening/Weekend <input type="checkbox"/> Not Full-Time ii) Mode: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Independent Study <input type="checkbox"/> External <input type="checkbox"/> Accelerated <input type="checkbox"/> Distance Education (submit distance education application with this proposal) iii) Other: <input type="checkbox"/> Bilingual <input type="checkbox"/> Language Other Than English <input type="checkbox"/> Upper Division Program
Diploma Programs	If the program is credit bearing <i>and</i> will lead to a Diploma or Advanced Diploma, indicate the registered degree program(s) to which the credits will apply:
Contact person for this proposal	Name and title: Kristin Walker, Manager of Academic Program Review Telephone: 607-255-2716 Fax: 607-255-2990 E-mail: walker@cornell.edu
CEO (or designee) approval	Name and title: W. Kent Fuchs, Provost Signature and date:  Dec. 15, 2012 If the program will be registered jointly ² with another institution, provide the following information:
<i>Signature affirms the institution's commitment to support the proposed program.</i>	Partner institution's name: Technion Name and title of partner institution's CEO: Peretz Lavie (President) Signature of partner institution's CEO: 

¹ CUNY and SUNY institutions: contact System Administration for program registration guidance.

² If the partner institution is non-degree-granting, see [CEO Memo 94-04](#).

Program registration is based on standards in the [Regulations](#) of the Commissioner of Education. Section [52.1](#) defines the curricula that must be registered. The Department registers individual curricula rather than the institution as a whole, but the registration process addresses major institutional elements. It is the chief means by which the Regents support the quality of college and university programs.

Please enter the requested information about the proposed program. Answer rows will expand as needed when information is entered. Application addenda for professional licensure, teacher certification, and educational leadership certification programs contain additional items and direction.

1. Program Description and Purpose

a) Provide a brief description of the program as it will appear in the institution's catalog.

The dual Master of Science (M.S.) in Information Systems (Cornell) and Master of Science (M.S.) in Applied Information Sciences degree program is designed to enhance professional skills in practical Information Science. The concentration in Connective Media is particularly suited to students seeking advanced credentials for employment in industry. The program teaches students state-of-the-art skills in media technologies, user interface design, user experience, technical design, and the management of technical projects to enable them to contribute to society with professional skills, creative thinking, and ethical leadership. The degree requires 60 credits, of which 15 credits are from a two-semester long industrial project. The program further provides the student with an opportunity to work with an industry mentor as well as a faculty advisor, and involves business and entrepreneurship courses and practical experience beyond what is found in most other Master's degrees.

b) List educational and (if appropriate) career objectives.

A student who receives a dual M.S. in Information Systems and M.S. in Applied Information Sciences degree with a concentration in connective media is expected to demonstrate a mastery of core subject knowledge in the area of information systems as it relates to the disciplinary area of connective media, and complete a substantial project with input from industry.

Goals and their assessment plan:

1. Demonstrate mastery of core knowledge in the Information Systems discipline of connective media. Assessment: Successful completion of the basic courses and core courses.
2. Demonstration of the ability to formulate and solve problems, both individually and collaboratively. Assessment: The results of the exploratory project as well as the 15-credit project in the second year. In conjunction with any team-based project work completed as part of the M.S. curriculum, there will be a peer assessment process within the team itself.
3. Be able to explain the application and impact of their core knowledge to problems facing society and/or industry. Assessment: The 15-credit M.S. project requirement, with an industrial mentor (either from a for-profit or a non-profit corporation) that provides feedback.
4. Apply concepts from the entrepreneurial process, and translate ideas into products that impact society. Assessment: Successful completion of the two business courses, as well as (where appropriate) evaluation of a business plan developed in conjunction with the 15-credit project.

c) How does the program relate to the institution's mission and/or master plan?

This program is a core part of the institutional mission, both from an academic perspective and from a societal engagement perspective. The computing and engineering sciences are an important part of the university and already have many highly rated programs with excellent students. This program will add to the excellence in this area, growing both the faculty and the student body to provide a program that complements our existing strengths by having closer ties to industry and entrepreneurship than are practical in Ithaca where the industrial base is small compared to the scale of our academic programs. The program will not only lead to growth in numbers, it will broaden our faculty and student bodies by attracting more entrepreneurially and commercially inclined individuals and by attracting people from highly diverse backgrounds.

From the societal engagement perspective, this program will have substantial economic development effects in New York City and also more broadly in New York State as we become more widely known as an institution with strong commercial and entrepreneurial technology research and education. Economic growth and the creation of high quality, high paying jobs is a national priority and one that Cornell is poised to make a serious contribution to.

The CornellNYC Tech Campus has a separate budget from the Ithaca campus and will not divert resources from the Ithaca budget, nor vice versa. It is highly beneficial to Cornell overall, however, to have close ties between the CornellNYC Tech Campus and the Ithaca campus to allow existing departments and fields to grow and broaden rather than having separate new departments and fields. Therefore Cornell faculty hired on the CornellNYC Tech Campus will have appointments in existing departments at the university and be regular full voting members of those departments. Cornell faculty will also be appointed to existing graduate fields at the university. Nonetheless from a budgetary standpoint faculty on each campus will be paid from the budget for that campus. The Cornell faculty will function as one body from the point of view of hiring, tenure, promotion and development of degree programs. However, from a financial standpoint the CornellNYC Tech Campus budget will cover activities in New York City and the Ithaca Campus budget will cover activities in Ithaca. It will further be beneficial to have Cornell faculty based on one campus engaged in teaching and research on the other campus, in both directions, and for both short and long time periods. For instance, Cornell faculty on a given campus may spend a day a week on the other campus or may spend a semester or a year on the other campus. It is expected that the budget on each campus will cover costs related to activities on that campus, even for faculty whose permanent base is the other campus, and any such costs will be agreed to by the relevant deans.

d) Describe the role of faculty in the program's design.

This program was designed by a representative faculty committee that sought to fashion an innovative curriculum that provides both an interdisciplinary background and the requisite technical and entrepreneurial expertise to well position graduates of the program in the high tech sector. This program is part of a dual degree program that will reside within the Technion-Cornell Innovation Institute, which is an integral part of the Cornell NYC Tech campus. Consequently, this faculty committee was in close consultation with a counterpart committee of faculty at the Technion Israel Institute of Technology. A preliminary version of the curriculum was carefully reviewed by the full faculty of Cornell's graduate fields of Computer Science and of Information Science.

e) Describe the input by external partners, if any (e.g., employers and institutions offering further education).

This program prepares students to be software engineers, system developers, technical managers and founders of technology startup companies, with domain expertise in Connective Media. Current Information Science, M.P.S. and Computer Science, M.E. students receive multiple job offers and starting salaries that regularly top \$100,000 per year due to high demand. Meeting with companies both nationally and in the New York area, we have determined that there is large unmet demand for Cornell-quality graduates with a Computer Science or Information Science masters-level education. An example of this is the recent startup career fair which had over 40 companies visiting campus and posting over 100 open technical jobs just at that single event. Example companies for graduates include Google, Facebook, Microsoft, Twitter, Foursquare, Etsy, Amazon, GE and many others. Google alone plans to hire over 3,000 people this year, many of them in Computer Science, Information Science, and related fields, and many of them in New York City. Only a handful of existing educational programs produce students of the caliber of Cornell in this field (e.g., MIT, Stanford, CMU, UC Berkeley), and the demand, both nationally and in the New York Region for such high quality students is much higher than the supply. Employers recognize the difference between our students and those from lesser programs and want the high caliber students.

f) What are the anticipated Year 1 *through* Year 5 enrollments?

Enrollment is primarily limited by faculty count as well as by application pool size and quality. We expect the limiting factor in practice to be faculty size. Our planning is based on the figure of approximately 6 M.S. students per faculty. As the CornellNYC Tech Campus develops, we expect enrollment in the M.S. program to increase, reaching at least 40 students after 5 years.

2. Sample Program Schedule

Complete **Table 1a** (for [undergraduate](#) programs) or **Table 1b** (for [graduate](#) programs).

- If the program will be offered through a nontraditional schedule, provide a brief explanation of the schedule, including its impact on financial aid eligibility.
- For existing courses that are a part of the major, submit a copy of the catalog description. For undergraduate programs, **provide syllabi for all new courses in the major**; for graduate programs, provide syllabi for all new courses. Syllabi should include a course description and identify course credit, objectives, topics, student outcomes, texts/resources, and the basis for determining grades.

3. Faculty

a) **Complete the faculty tables** that describe [full-time faculty](#) (**Table 2**), [part-time faculty](#) (**Table 3**), and [faculty to be hired](#) (**Table 4**), as applicable. Faculty curricula vitae should be provided only by request.

b) **What is the institution's definition of "full-time" faculty?**

A full time professorial faculty in the endowed colleges at Cornell is defined as 50% teaching (4 courses per academic year) and 50% research (sponsored and departmental).

4. Financial Resources and Instructional Facilities

a) **Summarize** the instructional facilities and equipment committed to ensure the success of the program.

This program will be offered by the CornellNYC Tech Campus in New York City, which will pay all the associated faculty, staff facilities and program costs, and which will also receive the tuition revenue from the program net of any revenue sharing of M.S. tuition with the Provost. The M.S. program resides within the Technion-Cornell Innovation Institute (TCII), an integral part of the CornellNYC Tech Campus. The TCII is jointly owned by Cornell (50%) and the Technion (50%), and hence revenues as well as expenses for this program will flow through the TCII. The CornellNYC Tech Campus is committed to hiring of faculty and staff, using tuition revenues, philanthropy (including the \$350M already committed as well as funds yet to be raised), and overhead for research. The planned faculty hiring is more than what is required to staff the program at the level of approximately 6 M.S. students per faculty member. The planned staff hiring also includes M.S. coordinators for each program, at the level of 1 per 100-120 students (based on experience from Ithaca and as described in more detail above).

The faculty teaching on the CornellNYC Tech Campus are expected to be a mix of new faculty based in New York City, who are planned to be hired beginning later this year, and existing faculty from the Ithaca campus and the Technion who will temporarily relocate to the CornellNYC Tech Campus for a semester or more, or (in the case of Cornell) who will commute between campuses (for instance as a number of Johnson School faculty currently do for the Executive MBA program in the Palisades). Salaries of faculty based in New York City will be paid by the CornellNYC Tech Campus budget, and payments will be made to the Ithaca campus for Ithaca-based faculty who are teaching in the CornellNYC Campus programs. For both Computer Science and Information Science, there will be a single Cornell tenure-track faculty and a single graduate field that span the Ithaca and Cornell campuses, ensuring the quality of the CornellNYC Tech Campus faculty and academic programs, as described above. As also noted previously, we expect to have approximately 6 M.S. students per faculty member, so the anticipated number of NYC-based faculty in the Departments of Information Science and Computer Science grows from around 3 to around 8 over the first 5 years, as the student population grows to 40 or more. Cornell faculty will offer 50% of the courses for the M.S. degree, and Technion faculty will offer 50% of the courses for the M.S. degree.

Physical resources are described under Facilities, but are summarized here. No other physical resources such as special laboratories or equipment are anticipated. This program, as well as other anticipated programs, can be offered in standard "office" type buildings with classroom and breakout spaces. Rented facilities for the first 5 years, from 2012-2015, will include classroom space, shared workspace and meeting areas for masters students, conference and breakout areas, as well as research facilities for faculty and their research groups. It is anticipated that the overall rented space will be approximately 30,000 square feet and be capable of supporting a population of approximately 300 faculty, students and associated staff. The space will be in a larger office building, and will be separately secured from other tenants in the building, but there will also be shared building security at the main entrance, as is common for office buildings in New York City. The classroom space will be configured for classes of up to approximately 30-40 students per

section, with smaller breakout and work spaces for M.S. students. The classroom, breakout and work spaces will be accessible to students in the program 24 hours a day, 7 days a week, but students will need their ID cards to gain entry to the building and to the Cornell space within the building.

b) Complete the [new resources table](#) (Table 5).

5. Library Resources

a) **Summarize the analysis of library resources for this program** by the collection librarian and program faculty. Include an **assessment of existing library resources** and their accessibility to students.

This program does not require additional library facilities or new resources beyond the extensive library resources already in place at Cornell University, because it is an extension of an existing set of programs, and all library resources required by students in the program are electronic rather than physical. The program will increase the student enrollment and faculty size, which may incur additional costs for library services depending on the nature of the agreements with publishers for access to electronic resources. The CornellNYC Tech Campus will pay such added costs as deemed necessary by the Provost.

b) **Describe the institution's response to identified needs and its plan for library development.**

The program will increase the student enrollment and faculty size, which may incur additional costs for library services depending on the nature of the agreements with publishers for access to electronic resources. The CornellNYC Tech Campus will pay such added costs as deemed necessary by the Provost.

6. Admissions

a) **List all program admission requirements** (or note if identical to the institution's admission requirements).

Students must have a B.S. or B.A. in information science, computer science, or in a related scientific or technical field, or have completed comparable coursework as part of their undergraduate degree. They must have a strong academic record, good recommendation letters from their undergraduate institution, and have sufficient foundations in science and mathematics to be able to succeed in the M.S. program.

A committee of faculty and instructors will review each applicant and make a recommendation for admission. The performance of previous graduates from their undergraduate institution is one of the criteria used to judge the strength of the academic record, along with GRE scores and the comments from three letters of recommendation. GREs are not required of Cornell or Technion undergraduates from Information Science or Computer Science who apply to the program.

Students will apply to this specific program, indicating both field and location, for instance applying to the Master's program in NYC versus other Master's degree programs in Ithaca. If students wish to apply to specify a second choice alternate location they may do so on their application.

b) **Describe the process for evaluating exceptions to those requirements.**

A faculty director is responsible for all admissions decisions, based on committee evaluation of candidate qualifications. The faculty director, in consultation with a broader representation of faculty, will evaluate possible exceptions on a case-by-case basis, but the ultimate decision will be made by the faculty director.

c) **How will the institution encourage enrollment by persons from groups historically underrepresented in the discipline or occupation?**

It is anticipated that this new degree program will attract an applicant pool similar to graduates of our undergraduate degrees in Information Science and students in the Master of Engineering degree in Computer Science. Both attract a diverse range of students. Most applicants to the M.E. are recent graduates, though some arrive with industry experience. Historically, the matriculated class in Computer Science has been 17-24% female and 2-3% underrepresented minorities (URM); the matriculated (undergraduate) class in Information Science has been 25-45% female and 5-10% underrepresented minorities. We expect the applicant pool and student body in New York City to be

closer to that of Information Science, especially with regards to URM students.

Faculty and staff at CornellNYC Tech will build on Cornell University's long tradition of fostering an inclusive environment. A key mission of CornellNYC Tech is developing educational partnerships with the public schools and local community colleges to increase the numbers of qualified women and under-represented minority students. It is expected that, over time, those programs will produce more college graduates who will be both qualified and interested particularly in Cornell because of their exposure to our campus earlier in their education.

7. Academic Support Services

Summarize the academic support services available to help students succeed in the program.

Staff time for a M.S. coordinator, located at the CornellNYC Tech Campus, will be budgeted to provide support services for the M.S. students on the campus. This coordinator also will handle admissions support and orientation support for new students, working under the supervision of a Faculty Program Director who will also be located on the CornellNYC Tech campus. The M.S. coordinator and Faculty Program Director in NYC will work closely with the Director and support staff already located in Ithaca on curriculum or other aspects of the program requiring coordination between the two campuses or requiring the approval of the graduate faculty.

The M.S. coordinator at CornellNYC Tech Campus serves as a point of contact for students during their entire time in the program, assisting those who have questions about academic requirements, providing administrative support for the program, and keeping a record of the students' progress in finding a project, advisor, and mentor.

We expect to share the student services staff across a set of M.S. programs on the CornellNYC Tech Campus. Based on experience in Ithaca, we expect approximately one NYC-based student services support person per 100-120 students in the M.S. programs, together with a local faculty coordinator for each program. The more programs that a particular staff person is supporting, the fewer total students we expect them to support. A person fully committed to a single program can support 120 or more students, whereas someone supporting two or more programs might only be able to support 100 or even fewer students.

8. External Review of Graduate Degree Programs

If the proposal is a graduate degree program below the doctoral level, submit a copy of an evaluation ([Word](#)) ([PDF](#)) of the program by a recognized expert in the field who has been approved in advance by the State Education Department. In addition, submit the institution's response to the evaluation and highlight how the proposal was modified in response to the reviewer's comments.

9. Credit for Experience

If this program will grant substantial credit for learning derived from experience, describe the methods of evaluating the learning and the maximum number of credits allowed.

No credit is granted for experience. Only course credit taken from a degree granting university will be considered for credit, and must both be substantially the same in content (as determined by the graduate field), and must not have been used towards any other degree. For Cornell undergraduates, this can include courses taken while an undergraduate as long as they were not used for the degree. For students from other institutions, only courses taken in a non-degree program are eligible for transfer.

Even though transfer credit may be granted for the Basic Courses, Core Courses, or Technical Elective courses, all students must complete a total of 60 credits at Cornell NYC Tech. Transfer credits granted for basic courses or core courses must be replaced with an equal number of technical elective credits.

Items 10 through 12 are for general academic and professional licensure program proposals only.

10. Program Assessment and Improvement

Summarize the plan for periodic evaluation of the new program, including the use of data to inform

program improvement.

All departments, degree-granting graduate fields, and centers are reviewed every 7 to 10 years. The Faculty Committee on Program Review (FCPR), a university-wide professorial faculty committee, oversees the review process.

Academic program reviews were initiated in 1995 and serve as the primary mechanism used to evaluate and continuously improve academic programs at Cornell. The evaluations made by program reviews are oriented within the context both of disciplinary norms and unit, college, and university missions. External review teams identify program strengths, weaknesses, and opportunities, and offer specific recommendations to assist programs in their efforts to improve.

An academic program review consists of two phases: a self-study by the department faculty and an evaluation by an external review team.

11. New/Emerging Field and Allied Health Areas (Undergraduate Degree Programs)

If the proposal for an undergraduate degree program falls into any of the following categories, submit a copy of an **evaluation** ([Word](#)) ([PDF](#)) of the program by a recognized expert in the field who has been approved in advance by the State Education Department. In addition, submit the institution's response to the evaluation and highlight how the proposal was modified in response to the reviewer's comments. Categories:

- The program's subject matter represents a new or emerging field.
- The program is in an [allied health area](#), unless the institution can demonstrate that the program is accredited by an accrediting body for college-level programs in the field.

12. Transfer to Baccalaureate Programs

If the program will be **promoted as preparing students for transfer to a baccalaureate program**, provide a copy of an articulation agreement with at least one institution.

**CORNELL UNIVERSITY
NEW DEGREE PROGRAM PROPOSAL BELOW THE DOCTORAL LEVEL**

College or School:	CornellNYC Tech Campus and the Technion Israel Institute of Technology	Date:	12/19/2012
Program Title:	Dual MS in Information Systems (Cornell) and MS in Applied Information Sciences (Technion)	Degree:	Dual M.S.

Table 1: Sample Student Schedule

- Indicate **academic calendar** type: Semester Quarter Trimester Other (describe)
- Label each term in sequence, consistent with the institution's academic calendar (e.g., Fall 1, Spring 1, Fall 2)
- Use the table to show **how a typical student may progress through the program**; copy/expand the table as needed.

Term: First Semester (Fall or Spring)						Term: Second Semester (Fall or Spring)					
Check course classification(s)						Check course classification(s)					
Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)	Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)
CS 5N00 Modern Data Analytics	4		x			CS 5190 Networks	4		x		
CS 5432 Physical Computing	4		x			CS 5300 Arch. Of Large Scale Info. Sys.	4		x		
NCC 5540 Managing and Leading Orgs	3					COMM 4400 Advanced HCI Design	3		x		
INFO 5N01 Soc. Asp. Connective Media	3		x			NBA 5070 Entrepreneurship for Sci&Eng	3				
						INFO 5N02 Exploratory Project	2		x		
Term credit total:	14		11			Term credit total:	16		13		
Term:						Term:					
Check course classification(s)						Check course classification(s)					
Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)	Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)
CS 5670 Intro. to Computer Vision	4		x			CS 5620 Computer Graphics	4		x		
CS 4740 Intro. Natural Lang. Proc.	4		x			CS 5430 System Security	3		x		
INFO 5N05 M.S. Project	7		x			INFO 5N05 M.S. Project	8		x		
Term credit total:	15		15			Term credit total:	15		15		
Term:						Term:					
Check course classification(s)						Check course classification(s)					
Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)	Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)
Term credit total:						Term credit total:					
Term:						Term:					
Check course classification(s)						Check course classification(s)					
Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)	Course Number & Title	Cr	LAS	Maj	New	Prerequisite(s)
Term credit total:						Term credit total:					
Program Totals:		Credits: 60		Liberal Arts & Sciences: 0		Major: 54		Elective & Other: 6			

**CORNELL UNIVERSITY
NEW DEGREE PROGRAM PROPOSAL BELOW THE DOCTORAL LEVEL**

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Program Title:	Dual MS in Information Systems (Cornell) and MS in Applied Information Sciences (Technion)	Degree:	Dual M.S.

Table 2: Full-Time Faculty

Faculty teaching at the graduate level must have an earned doctorate/terminal degree or demonstrate special competence in the field. Provide information on faculty members who are **full-time at the institution** and who will be teaching each course in the major field or graduate program. The application addendum for professional licensure, teacher certification, or educational leadership certification programs may provide additional directions for those types of proposals.

Faculty Member Name and Title (include and identify Program Director)	Program Courses to be Taught	Percent Time to Program	Highest and Other Applicable Earned Degrees & Disciplines (include College/University)	Additional Qualifications: list related certifications/licenses; occupational experience; scholarly contributions, etc.
Deborah Estrin	CS 5190: Networks	50%	Ph.D.	NAE Member Fellow of AAAS, ACM, IEEE
Other NYC-based faculty members to be hired by Cornell NYCTech and the Technion	Any of the courses listed may be taught by either Cornell or Technion faculty.			

**CORNELL UNIVERSITY
NEW DEGREE PROGRAM PROPOSAL BELOW THE DOCTORAL LEVEL**

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Program Title:	Dual MS in Information Systems (Cornell) and MS in Applied Information Sciences (Technion)	Degree:	Dual M.S.

Table 3: Part-Time Faculty

Faculty teaching at the graduate level must have an earned doctorate/terminal degree or demonstrate special competence in the field. Provide information on part-time faculty members who will be teaching each course in the major field or graduate program. The application addendum for professional licensure, teacher certification, or educational leadership certification programs may provide additional directions for those types of proposals.

Faculty Member Name and Title	Program Courses to be Taught	Highest and Other Applicable Earned Degrees & Disciplines (include College/University)	Additional Qualifications: list related certifications/licenses; occupational experience; scholarly contributions, etc.
There are outstanding PhD-level researchers at IBM in Westchester county, at Google in Manhattan, and at other similar companies. We expect to engage a select number of these individuals in adjunct or part-time teaching, not to exceed half of the overall teaching effort.			
	Any of the courses listed may be taught by adjuncts. However, a maximum of half the courses will be taught by non-tenure track faculty.		

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NEW DEGREE PROGRAM PROPOSAL BELOW THE DOCTORAL LEVEL**

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Table 4: Faculty to be Hired

If faculty must be hired, specify the number and title of new positions to be established and minimum qualifications.

Title/Rank of Position	No. of New Positions	Minimum Qualifications (including degree and discipline area)	F/T or P/T	Percent Time to Program	Expected Course Assignments	Expected Hiring Date
Professor or Associate Professor	8 or more	PhD in Information Science, Computer Science, or related field	F/T	100%		2012 through 2017

**CORNELL UNIVERSITY
NEW DEGREE PROGRAM PROPOSAL BELOW THE DOCTORAL LEVEL**

College or School:	CornellNYC Tech and the Technion Israel Institute of Technology	Date:	12/19/2012
Program Title:	Dual MS in Information Systems (Cornell) and MS in Applied Information Sciences (Technion)	Degree:	Dual M.S.

Table 5: New Resources

List **new** resources that will be engaged specifically as a result of the new program (e.g., a new faculty position or additional library resources). New resources for a given year should be carried over to the following year(s), with adjustments for inflation, if they represent a continuing cost.

New Expenditures	Year 1	Year 2	Year 3
Personnel	\$0.75M	\$1.75M	\$2.5M
Library	Nominal	Nominal	Nominal
Equipment	\$0.25M	\$0.25M	\$0.25M
Laboratories	None	None	None
Supplies & Expenses (Other Than Personal Service)	\$0.25M	\$0.25M	\$0.25M
Capital Expenditures	None	None	None
Other (Lease)	\$0.25M	\$0.25M	\$0.5M
Total all	\$1.5M	\$2.5M	\$3.5M

CornellNYC Tech and the Technion Israel Institute of Technology

Dual MS in Information Systems (Cornell) and MS in Applied Information Sciences (Technion)

Course Descriptions

CS 5430 - System Security, 4 credits.

Prerequisites: CS 4410 and familiarity with Java, C, or C# programming languages.

Discusses security and survivability for computers and communications networks. Includes discussions of policy issues (e.g., the national debates on cryptography policy) as well as discussions of the technical alternatives for implementing the properties that comprise “trustworthiness” in a computing system. Covers mechanisms for authorization and authentication as well as cryptographic protocols.

CS 4740 - Introduction to Natural Language Processing, 4 credits.

Prerequisite: CS 2110.

Computationally oriented introduction to natural language processing, the goal of which is to enable computers to use human languages as input, output, or both. Possible topics include parsing, grammar induction, information retrieval, and machine translation.

CS 5300 - The Architecture of Large - Scale Information Systems, 4 credits.

Prerequisite: INFO 3300/CS 3300 or CS 4320.

Deals with the architecture of large-scale information systems, with special emphasis on Internet-based systems. Topics include three-tier architectures, edge caches, distributed transaction management, web services, workflows, performance scalability, and high-availability architectures. The course includes a substantial project in the context of three-tier architectures, involving web servers, application servers, and database systems. Students study and use technologies such as Web Services, .Net, J2EE, ASPs, Servlets, XML, and SOAP.

CS 5320 - Introduction to Database Systems, 3 credits.

Prerequisites: CS 3110 (or CS 2110 and permission of instructor).

Introduction to modern database systems. Concepts covered include storage structures, access methods, query languages, query processing and optimization, transaction management, recovery, database design, XML, and XQuery. The course focuses on the design and internals of modern database systems.

COMM 4400 - Advanced Human-Computer Interaction Design, 3 credits.

Prerequisite: COMM 3450/INFO 3450 or permission of instructor.

Focuses on the design of computer interfaces and software from the user’s point of view. The goal is to teach user interface designs that “serve human needs” while building feelings of competence, confidence, and satisfaction. Topics include formal models of people and interactions, collaborative design issues, psychological and philosophical design considerations, and cultural and social issues.

CS 5432 - Physical Computing, 4 credits.

Prerequisites. CS 3140 or equivalent

This course provides a hands-on introduction to the resources for designing and fabricating smart systems using hardware components, including sensors and sensor networks; analog instrumentation; embedded digital processing (microcontroller programming such as the Arduino system); graphics and I/O chips; flash memory; wired and wireless communications; PCB layout and fabrication. The key characteristics of the components and their interfaces will be presented. Using these tools, small multidisciplinary groups will conduct a hardware project of their choice.

CS 5190 - Computer Networking, 4 credits.

Prerequisite: CS4410 (Operating Systems)

Focuses on architectural principles of computer networking (robustness, scalability, end-to-end), design of network mechanisms and protocols used in today's Internet, and advanced topics such as new media, software defined networking, security, and mobility. This course is appropriate for advanced students who have none or limited networking knowledge. The homework and final project will require implementation, so students should have programming skills at the level of CS2110.

CS 5780 - Machine Learning, 4 credits.

Prerequisite: CS 2800, or basic probability and basic knowledge of linear algebra

Introduces the fundamental set of techniques and algorithms that constitute machine learning as of today.

CS 5620 - Introduction to Computer Graphics, 3 credits.

Prerequisite: CS 2110.

Introduction to the principles of computer graphics in two and three dimensions. Topics include digital images, filtering and antialiasing, 2-D and 3-D affine geometry, ray tracing, perspective and 3-D viewing, the graphics pipeline, curves and surfaces, and human visual perception. Homework assignments require some Java programming.

CS 5670 – Introduction to Computer Vision, 4 credits.

Prerequisites: CS 2110, CS 2800.

An in-depth introduction to computer vision. The goal of computer vision is to compute properties of our world—the 3D shape of an environment, the motion of objects, the names of people or things—through analysis of digital images or videos. The course covers a range of topics, including 3D reconstruction, image segmentation, object recognition, and vision algorithms for the Internet, as well as key algorithmic and optimization techniques, such as graph cuts and non-linear least squares. This course emphasizes hands-on experience with computer vision, with several large programming projects.

CS 5N00 - Modern Data Analytics, 4 credits.

Modeling - Bayesian and frequentists models: hypothesis testing and estimation. Supervised learning: classification and regression, linear discriminant analysis, SVMs, nearest neighbors, decision trees. Validation of algorithms: validation, cross validation, leave one out. Unsupervised learning: Dimensionality reduction, principal component analysis, singular value decomposition, low-rank approximations, clustering. Graphical models in a nutshell. Concepts in learning: overfitting, inductive bias, regularization, robustness and stability, generalization bounds. Combining learning algorithms: weak learners, boosting, bagging.

ORIE 4850 - Applications of Operations Research and Game Theory to Information Technology, 3 credits.

Prerequisites: ORIE 3310, 3510, or permission of instructor.

Covers operations research and game theoretic problems arising in information technology, e.g., web searching, network routing and congestion control, online auctions, and trust and reputations in electronic interactions.

NBA 5070 - Entrepreneurship for Scientists and Engineers, 3 credits

Specifically designed for mentored independent study, this course is customized using streaming video, guest speakers, distance learning, and special lectures/tutorial sessions. Work is focused on a single project: students form a startup team and follow a technical business idea of their own choosing through the process of developing and founding a business that can attract venture investors. Learn how high-technology ideas are converted into world-class businesses in venture-backed startup companies as well as in new business development in existing companies. Tutorial sessions with professors apply lessons to the team business plan.

NCC 5540 - Managing and Leading Organizations, 3 credits

Ultimately, the goal of managers and leaders is to get things done in organizations. Most of that work is accomplished by effectively managing other people. Using text-based cases, video cases, audio cases, exercises, and readings, the course will focus on the skills managers need to be successful in their firms and in their careers. An important course goal is to help students hone their critical thinking and problem-solving skills. To this end, case analyses will require students to take problems apart into their component parts, to uncover their root causes, and to develop workable solutions. The instructor will introduce frameworks and models that will help students analyze organizational problems and generate appropriate solutions. Major content themes focus on motivating employees, understanding organizational design and organizational culture, persuading and influencing others, and managing change. The course is particularly relevant for students who (1) plan to work in corporations; or (2) intend to manage and lead firms; or (3) plan to work in the consulting industry; or (4) think about founding and/or owning startup companies.

INFO 5N01 - Psychological and Social Aspects of Connected Media , 4 credits

This course explores the behavioral foundations of communication technology and the information sciences, and the ways in which theories and methods from the behavioral sciences play a role in understanding people's use of, access to and interactions with information and communication technologies. Multiple levels of analysis -- individual, small group, and larger collectives -- will be included, along with multiple disciplinary perspectives. Course topics will include: Introduction to behavioral research methods; principles of human perception and cognition; cognitive perspectives on design, attention and memory; emotion/ affect; psychological theories of language use and self-presentation in computer-mediated communication; social psychological perspectives on coordination and group work (digital interaction), organizational science theories of social ties and relationships; user motivation, persuasion. Methodological topics will include the design of lab and field experiments, survey studies, and field observations, common statistical techniques used in the behavioral sciences and how to interpret them, and strategies for reporting results from behavioral science studies. Key course outcomes include: the ability to read and understand behavioral social science articles and studies, and basic familiarity with key behavioral theories often used in information science, and their role in both research and design. Basic knowledge of key assumptions and constraints with common basic stats methods such as t-tests, ANOVA, CHI-Square, and OLS regression should be covered.

INFO 5N02 - Exploratory Project, 2 credits

Initial group project in the area of Connective Media. The project is conducted in conjunction with a faculty member and possibly in collaboration with a local company. The goal of the project is the design and evaluation of an innovative device or system in the connective media technology sector.

INFO 5N03 - Requirements and Design for social media, entertainment and e-news, 3 credits

Typical requirements and system designs for media systems will be described and analyzed, with reference to specific techniques from other courses. Case studies include: social network requirements and design (e.g., Facebook, Twitter), Electronic news (e.g., New York Times, Huffington Post), video streaming (e.g, Hulu, Netflix). Issues include Push versus Pull organization, flexibility and extensibility, personalization, privacy, reliability, open source development.

INFO 5N04 - Advanced Media Devices , 3 credits

Innovative devices and interfaces to request and provide media services. Vision-directed information, as in Google's prototype glasses. Eye movement in pilot helmets. Speech as an interface. Streaming. Recent developments in sharing information and images.

INFO 5N05 - Master of Science Project, Variable number of credits

This is a continuation of the Connective Media design project initiated in the Exploratory Project (INFO 5N02). The goal is to develop and evaluate a working prototype of innovative devices or systems for the connective media technology sector.

INFO 5N06 - Networks , 4 credits

This interdisciplinary course examines network structures and how they matter in everyday life. The course examines how each of the computing, economic, sociological and natural worlds are connected and how the structure of these connections affects each of these worlds.

Mathematical models for networks: Tools of graph theory and game theory are taught and then used to analyze networks. Topics covered include the web, the small world phenomenon, markets, neural networks, contagion, search and the evolution of networks, strong and weak ties.

INFO 5N07 – Social Media, 3 credits

The course will examine several approaches to understanding technology and its role in communication and social interaction in online communities (e.g., social network sites and virtual worlds). Topics include: psychological aspects of computer-mediated communication; how people join and become engaged in online communities; case studies that examine specific types of communities in greater detail.