BROOKLYN COLLEGE
OF
THE CITY UNIVERSITY OF NEW YORK
FACULTY COUNCIL

Meeting of 03/08/2016

The Committee on Graduate Curriculum and Degree Requirements herewith submits its recommendations in Curriculum Document 232

Respectfully submitted,

Beth Evans – Library, Chairperson
Min Hee Go – Political Science
Daniel Kurylo - Psychology
Paula Massood - Film
Howard Zeng – Kinesiology

Members of Faculty Council with any questions are urged to contact **Beth Evans** at **bevans@brooklyn.cuny.edu** prior to the meeting.

SECTION A-III: CHANGES IN DEGREE PROGRAMS
Department of Theater

Date of departmental approval: December 8, 2015

Effective Date of the change: Fall 2016

M.F.A. degree program in theater (HEGIS code 1007; SED program code: 76211)

Degree Requirements
Sixty credits are required for the degree.

Students must also submit a thesis based on a thesis project and/or production acceptable to the department. Information about requirements for the thesis is in the section "Academic Regulations and Procedures."

Prior to the above, all students must undergo a pre-thesis evaluation (existing of a work-in-progress shown to the faculty, an academic progress review by faculty, or both) by the time they complete 24 credits. If a student's progress is not deemed satisfactory by the head of the relevant concentration, the student will be denied the approval of a thesis production or project until the deficiencies noted in written form to the student have been corrected.

Students must complete requirements in one concentration as follows. No student may exceed a total of 12 credits in practicum and/or externship courses. The remaining credits required for the degree must be in courses chosen in consultation with the head of concentration.

Acting: Theater 7321X, 7322X, 7323X, 7324X, 7331X, 7332X, 7333X, 7334X, 7341X, 7342X, 7325X, 7343X, 7344X, 7351X, 7352X, 7353X, 7354X, and 7742X. Acting candidates are required to audition for all departmental productions and must accept roles as cast. Before taking Theater 778X, students must perform in a pre-thesis role approved by the head of concentration, and may serve as a production running crew supervisor.

Design and technical production: Theater 7212X, 7213X, 7415X, 7431X, 7433X, 7435X, 7421X, 7721X, 7722X, 7723X, 7742X; and a minimum of three additional courses in design and technical production. Before taking Theater 7742X, students must complete designs for actual productions at the experimental or thesis production level and must complete a design for a major production in fulfillment of the practicum course requirements.

Directing: Theater 7311X, 7611X, 7511X, 7512X, 7513X, 7722X or 7622X, 7723X or 7623X, 7514X, 7515X, and 7742X.

Performing arts management: Theater 7442X, <u>7610X,</u> 7611X, 7612X, 7613X, 7615X, 7616X, 7617X, 7619X, 7621X, 7622X, 7623X~~, and Accounting 7101X~~. Students must take two of the following courses: THEA 7212X, 7213X, 7214X, 7215X, 7216X, 7223X, 7224X, 7231X, 7232X, or 7233X. With a few exceptions, students must also take Theater 7631X, which requires the satisfactory completion of a ten- to fifteen-week residency with a professional arts

organization or agency approved by the chairperson and a thesis report based on the residency experience.

Courses in the Theater Department offered toward the degree must be 7000-level courses. The program of study must be approved in advance by the head of concentration.

Rationale

The purpose of the Performing Arts Management Program is to provide an opportunity for students to broaden their knowledge of the performing arts, to help them acquire and apply an understanding of business theories and techniques to the performing arts, and to assist them in gaining meaningful work experiences in the field through internships and professional residencies. Upon graduation, students are immediately qualified to assume specialized administrative positions with professional arts organizations and, eventually assume leading management positions in the field.

Through the addition of THEA 7610X to the Performing Arts Management Program, students gain essential foundational tools for a successful managerial position in performing and media arts. THEA 7610X will provide students with the fundamental understanding of accounting as a means for financial decision making by companies, with an emphasis on the unique way accounting is utilized by media companies and arts institutions. Furthermore, this accounting course will help students develop their critical and analytical thinking, which is a necessity in all managerial positions. THEA 7610X meets program goals of: Communicating effectively and professionally in an area of specialization and creation of work that involves professional collaboration, discipline and standards.

The Performing Arts Management program is a two year program. All program learning goals are in concert with each other and integrated into all Performance Management courses. Thus assessment of student growth and completion of program goals is conducted through review of student performance in required courses. Then at the end of the second year of the program students are assessed through the completion of a thesis paper. In the thesis paper, students identify what they have learned and articulate how they have been able to apply those learning goals to their current performing arts job.

SECTION A-III: CHANGES IN DEGREE PROGRAMS
Department of Theater

M.F.A. degree concentration in Performing Arts Management
(HEGIS code: 1007; SED program code: 76211)

Supplemental Data

THEA 7212X	History of the Theater to 1642	3 credits
THEA 7213X	History of the Theater from 1642	3 credits
THEA 7214X	Global Theater History and Theory I	3 credits
THEA 7215X	Global Theater History and Theory II	3 credits
THEA 7216X	Global Theater History and Theory III	3 credits
THEA 7223X	History of American Theater	3 credits
THEA 7224X	History of Musical Theater	3 credits
THEA 7231X	Studies in Theater History and Production	3 credits
THEA 7232X	Studies in Theater History and Production	3 credits
THEA 7233X	Studies in Theater History and Production	3 credits
THEA 7442X	Theater Design and Planning	3 credits
THEA 7610X	Accounting for the Performing and Media Arts	3 credits
THEA 7611X	Principles of Performing Arts Management	3 credits
THEA 7612X	Business Management for the Performing Arts	3 credits
THEA 7613X	Promotion and Marketing for the Performing Arts	3 credits
THEA 7615X	Fundraising for the Performing Arts	3 credits
THEA 7616X	Performing Arts and the Law	3 credits
THEA 7617X	Labor and Employee Relations in the Performing Arts	3 credits
THEA 7619X	Seminar in Performing Arts Management	3 credits
THEA 7621X	Performing Arts Externship	4 credits
THEA 7622X	Performing Arts Externship	4 credits
THEA 7623X	Performing Arts Externship	4 credits
THEA 7631X	Professional Residency and Thesis	6 credits

SECTION: A-IV NEW COURSE

Department of Childhood, Bilingual and Special Education

Date of Departmental Approval: December 8, 2015

Effective date for course becoming part of curriculum: Fall 2016

CBSE 7317T: Human Tracks in the Urban Landscape: A practicum in art, technology and the environment
45 hours; 3 credits

Bulletin Description:
Exploration of the visual arts and the natural sciences as complementary forms of active inquiry. Investigation of representational codes, epistemologies, and habits of mind common to the artistic and scientific endeavors. Construction of site-specific, artistic installations and digital imagery as strategies for observation, documentation, and reflection upon contemporary environmental and aesthetic issues. Introduction to designing interdisciplinary curriculum, instruction, and evaluation of learning across visual art and environmental science content areas. Pedagogical focus on Pre-K-12 students from diverse cultural and linguistic backgrounds; including gifted and talented and students with disabilities. Topics include affordances of natural and man-made materials, tools, and resources; digital image technology; place-based instruction, theories and research-validated pedagogical methodology. Studio and on-site field work required. This course is the same as ECAE 7546T and SEED 7317T.
Prerequisites and/or corequisites: Matriculation in the MA or Advanced Certificate Program in Teaching Art (PK-12); the MS in Childhood Education Teacher of Science and Environmental Education (1-6); the M.A.T in Adolescence Science Education (grades 7-12), or post-graduate, in-service teachers of Art or Science.

Frequency of Offering: Once every summer semester

Projected enrollment: 20- 25 students per year. The course is open to graduate students in the ECAE, CBSE, and SEED departments, and in-service teachers seeking professional development credits.

Clearances: Art Department

Rationale:
Children and adolescents in the 21st century are growing up at a time when the natural environment is increasingly threatened. Teachers of these future global citizens are tasked with designing curriculum that prepares students to respond to and represent the world and their place in it using a variety of representational systems that span disciplinary boundaries. This proposed interdisciplinary course examines the complementary nature of artistic and scientific inquiry, for the purpose of engaging students' critical thinking and analytical skills to make meaningful connections with the natural and built world. This includes but is not limited to modes of inquiry, what counts as a problem, observational categories, representational techniques, and standards of proof.

An interdisciplinary course committed to developing and fostering meaningful connections between disciplines that takes place in Brooklyn's Prospect Park will be a strong admissions attraction to both the art education and science education programs at Brooklyn College. The course will be offered in summer as reflected in the five week outline below.

Department/Program Goals:

1) A goal of the art education program (PK-12) is for its graduates to be "skilled makers of art and insightful observers of visual culture; and articulate practitioners and advocates for art education in public and private educational settings in culturally diverse communities." This goal aligns with Brooklyn College's mission of being "an integral part of the civic, urban and artistic energy of New York." While studio and digital art courses are offered in other departments, those courses do not address the effect of artistic representational systems on learning or curriculum design. Much of the pedagogical research on the integration of the arts into the broader curriculum either tacitly or explicitly puts the arts in the position of being the handmaiden to other disciplines (Fisk, 1999). Rather than *grafting* art onto science, this proposed course would find the "art" in science and the "science" in art.

2) An important goal of the Science and Environmental Education (1-6); the M.A.T in Adolescence Science Education (grades 7-12) programs is to engage students by extending science teaching beyond the boundaries of the classroom. As much of work takes place in Prospect Park, this course applies the program's City-as-Lab approach that emphasizes place-based, authentic science learning. This goal aligns with Brooklyn College's mission of "use[ing] the entire city as a living classroom that broadens our students' understanding of the world around them." This goal is also consistent with the Next Generation Science Standards "to help today's children prepare for a world in which technological change and the consequent impact on society and natural resources." This proposed course builds upon emerging research for STEAM (putting the Arts into STEM) that provides evidence of the pedagogical benefits of merging art and science in the K-12 setting for the purpose of inquiry into large global imperatives for greater environmental and resource sustainability, nationally and in our communities.

3) A broad goal of both the art education and science education programs at Brooklyn College is to offer pre- and in-service teachers fundamental pedagogical insights about interdisciplinary learning that they can draw upon when they are teachers. This course addresses this shared goal by giving students the opportunity to explore the parallel functionality of artistic and scientific modes of inquiry, and to think complexly about environmental issues through art making. These goals in turn, will guide future and current teachers to develop instructional materials that extend their own students' sense of agency and capacity to read the world. Using Brooklyn's Prospect Park as a setting for learning will encourage students to reflect upon the diversity of the human-made world, and its representations of the non-human world, and will challenge them to re-vision possible built communities that include nature in that diversity.

Objectives:

1) To address the goal of encouraging art education students and in-service teachers to become increasingly skilled makers of art and insightful observers of visual culture, students will rely upon found and natural materials as a source of inspiration for their art work. They will document their understanding of the aesthetic experience as a transaction between artist and viewer by collecting and manipulating "tracks" --indicators of intentional and unintentional human presence—within the ecologically sensitive urban environment of Prospect Park and broader ecosystems in general. (NCCAS Anchor Standard #1: Generate and conceptualize artistic ideas; #2: Organize and develop artistic ideas; #3: Refine and complete artistic work.)

2) To address the goal of engaging science education students and in-service teachers in place-based, authentic science learning, students will demonstrate a renewed awareness of their natural and human-made surroundings through careful observation and effortful seeking to understand the environmental, social, and aesthetic systems within the Park. They will also demonstrate knowledge of new technologies and analyze the costs and benefits of decisions made about the use of technology. (NGSS Core idea: Instructional emphasis on the limits to growth imposed by human society and by the environment, which has limited supplies of certain non-renewable resources).

3) To address the goal of presenting visual art and environmental science as complementary forms of active inquiry, art and science teacher candidates and in-service teachers will demonstrate knowledge of shared methods, values and expectations for learning in both disciplines in the following ways:

- think of visual art /environmental science as alternative and complementary processes of active exploration and discovery.
- show a complex and nuanced understanding of how art making and the scientific method cultivate certain "habits of mind," attitudes, and dispositions that are essential to successful learning in any discipline
- examine critically what constitutes as evidence of learning in each discipline--studio/laboratory/field site, critique/peer review. Evaluate and appraise choices/decisions made according to established and emergent criteria
- notice, attend to, and consider the representational codes and techniques of each discipline to the other

(NCCAS Standard #11: Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding) (NGSS LS2-7 Ecosystems: Interactions, Energy, and Dynamics. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity)

Anticipated Outcomes:

1) Art and science teacher candidates and in-service teachers will use a variety of artistic and scientific modes of inquiry and strategies (drawing, field notes, model making) to construct site-specific installations that comment meta-symbolically on the aesthetic and environmental imperatives for resource sustainability (global warming, etc.). In addition, the sculpture will demonstrate that students have relied upon complex "habits of mind" to design and implement their installations including imagination, curiosity, reflection, weighing alternatives, improvising, making judgments in the absence of rules, the ability to work collaboratively, willingness to experiment, persistence in the face of difficulty, learning from mistakes, and the capacity to offer and accept

constructive criticism.

2) Art and science teacher candidates and in-service teachers will "track" or document the search for source materials, evidence of self-discovery and learning, and development of meta-narratives for their installations. In framing the process through actual and virtual means -- including photographs, video, mapping, notes, sound recordings, sketches, writing, or more-- students will compose the script for final presentations in which they share how they integrated visual art and environmental science paradigms in their work. These presentations could be developed further as papers for conferences or for professional development.

3) Art and science teacher candidates and in-service teachers will design an integrated curriculum unit for a specific grade level that lays out how artistic and scientific concerns and modes of inquiry merge through the concept of "human tracks." For example:

- we can use human tracks just as we use any art supply, in that they do not necessarily come with reservoirs of meanings, but rather as symbolic material that can be formed and transformed.
- human tracks have scientific application as indicators of evidence that humans are just another organism in a habitat, competing for limited resources.

SECTION: A-IV NEW COURSE

Department of Secondary Education

Date of Departmental Approval: December 8, 2015

Effective date for course becoming part of curriculum: Fall 2016

SEED 7317T: Human Tracks in the Urban Landscape: A practicum in art, technology and the environment
45 hours; 3 credits

Bulletin Description:
Exploration of the visual arts and the natural sciences as complementary forms of active inquiry. Investigation of representational codes, epistemologies, and habits of mind common to the artistic and scientific endeavors. Construction of site-specific, artistic installations and digital imagery as strategies for observation, documentation, and reflection upon contemporary environmental and aesthetic issues. Introduction to designing interdisciplinary curriculum, instruction, and evaluation of learning across visual art and environmental science content areas. Pedagogical focus on Pre-K-12 students from diverse cultural and linguistic backgrounds; including gifted and talented and students with disabilities. Topics include affordances of natural and man-made materials, tools, and resources; digital image technology; place-based instruction, theories and research-validated pedagogical methodology. Studio and on-site field work required. This course is the same as ECAE 7546T and CBSE 7317T.

Prerequisites and/or corequisites: Matriculation in the MA or Advanced Certificate Program in Teaching Art (PK-12); the MS in Childhood Education Teacher of Science and Environmental Education (1-6); the M.A.T in Adolescence Science Education (grades 7-12), or post-graduate, in-service teachers of Art or Science.

Frequency of Offering: Once every summer semester

Projected enrollment: 20- 25 students per year. The course is open to graduate students in the ECAE, CBSE, and SEED departments, and in-service teachers seeking professional development credits.

Clearances: Art Department

Rationale:
Children and adolescents in the 21st century are growing up at a time when the natural environment is increasingly threatened. Teachers of these future global citizens are tasked with designing curriculum that prepares students to respond to and represent the world and their place in it using a variety of representational systems that span disciplinary boundaries. This proposed interdisciplinary course examines the complementary nature of artistic and scientific inquiry, for the purpose of engaging students' critical thinking and analytical skills to make meaningful connections with the natural and built world. This includes but is not limited to modes of inquiry, what counts as a problem, observational categories, representational techniques, and standards of

proof.

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Department/Program Goals:
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2) An important goal of the Science and Environmental Education (1-6); the M.A.T in Adolescence Science Education (grades 7-12) programs is to engage students by extending science teaching beyond the boundaries of the classroom. As much of work takes place in Prospect Park, this course applies the program's City-as-Lab approach that emphasizes place-based, authentic science learning. This goal aligns with Brooklyn College's mission of "use[ing] the entire city as a living classroom that broadens our students' understanding of the world around them." This goal is also consistent with the Next Generation Science Standards "to help today's children prepare for a world in which technological change and the consequent impact on society and natural resources." This proposed course builds upon emerging research for STEAM (putting the Arts into STEM) that provides evidence of the pedagogical benefits of merging art and science in the K-12 setting for the purpose of inquiry into large global imperatives for greater environmental and resource sustainability, nationally and in our communities.

3) A broad goal of both the art education and science education programs at Brooklyn College is to offer pre- and in-service teachers fundamental pedagogical insights about interdisciplinary learning that they can draw upon when they are teachers. This course addresses this shared goal by giving students the opportunity to explore the parallel functionality of artistic and scientific modes of inquiry, and to think complexly about environmental issues through art making. These goals in turn, will guide future and current teachers to develop instructional materials that extend their own students' sense of agency and capacity to read the world. Using Brooklyn's Prospect Park as a setting for learning will encourage students to reflect upon the diversity of the human-made world, and its representations of the non-human world, and will challenge them to re-vision possible built communities that include nature in that diversity.

Objectives:

1) To address the goal of encouraging art education students and in-service teachers to become increasingly skilled makers of art and insightful observers of visual culture, students will rely upon found and natural materials as a source of inspiration for their art work. They will document their understanding of the aesthetic experience as a transaction between artist and viewer by collecting and manipulating "tracks" --indicators of intentional and unintentional human presence—within the ecologically sensitive urban environment of Prospect Park and broader ecosystems in general. (NCCAS Anchor Standard #1: Generate and conceptualize artistic ideas; #2: Organize and develop artistic ideas; #3: Refine and complete artistic work.)

2) To address the goal of engaging science education students and in-service teachers in place-based, authentic science learning, students will demonstrate a renewed awareness of their natural and human-made surroundings through careful observation and effortful seeking to understand the environmental, social, and aesthetic systems within the Park. They will also demonstrate knowledge of new technologies and analyze the costs and benefits of decisions made about the use of technology. (NGSS Core idea: Instructional emphasis on the limits to growth imposed by human society and by the environment, which has limited supplies of certain non-renewable resources).

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- examine critically what constitutes as evidence of learning in each discipline--studio/laboratory/field site, critique/peer review. Evaluate and appraise choices/decisions made according to established and emergent criteria
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(NCCAS Standard #11: Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding) (NGSS LS2-7 Ecosystems: Interactions, Energy, and Dynamics. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity)

Anticipated Outcomes:

1) Art and science teacher candidates and in-service teachers will use a variety of artistic and scientific modes of inquiry and strategies (drawing, field notes, model making) to construct site-specific installations that comment meta-symbolically on the aesthetic and environmental imperatives for resource sustainability (global warming, etc.). In addition, the sculpture will demonstrate that students have relied upon complex "habits of mind" to design and implement their installations including imagination, curiosity, reflection, weighing alternatives, improvising, making judgments in the absence of rules, the ability to work collaboratively, willingness to experiment, persistence in the face of difficulty, learning from mistakes, and the capacity to offer and accept

constructive criticism.

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3) Art and science teacher candidates and in-service teachers will design an integrated curriculum unit for a specific grade level that lays out how artistic and scientific concerns and modes of inquiry merge through the concept of "human tracks." For example:

- we can use human tracks just as we use any art supply, in that they do not necessarily come with reservoirs of meanings, but rather as symbolic material that can be formed and transformed.

human tracks have scientific application as indicators of evidence that humans are just another organism in a habitat, competing for limited resources.

SECTION A-V: CHANGE IN AN EXISTING COURSE

Department of Computer and Information Science

Change in Bulletin description

Date of departmental approval: November 10th, 2015

Effective Date: Fall, 2016

From:

CISC 7200X Analysis of Algorithms
37½ hours plus conference and independent work; 3 credits
Introduction to algorithms and their complexity, including models of computation. Review of data structures and techniques of efficient program design. Analysis of algorithms chosen from sorting and searching, graph theory, pattern matching, matrix operations, and combinatorial optimization. Algorithms will be analyzed for their space, time, and other resource requirements. NP-complete problems. Complexity classes.

Prerequisite: A course in data structures; and a course in discrete structures.

To:

CISC 7200X Analysis of Algorithms
37½ hours plus conference and independent work; 3 credits
Introduction to algorithms and their complexity, including models of computation. Review of data structures and techniques of efficient program design. Analysis of algorithms chosen from sorting and searching, graph theory, pattern matching, matrix operations, and combinatorial optimization. Algorithms will be analyzed for their space, time, and other resource requirements. NP-complete problems. Complexity classes. Not open to students who have completed an undergraduate course in analysis of algorithms.

Prerequisite: A course in data structures; and a course in discrete structures.

Rationale:
This introductory graduate class is for students who have not taken Analysis of Algorithms as an undergraduate. An undergraduate course in analysis of algorithms covers many of the relevant topics.

SECTION A-V: CHANGE IN AN EXISTING COURSE

Department of Computer and Information Science

Change in prerequisite and Bulletin description

Date of departmental approval: November 10th, 2015
Effective Date: Fall, 2016

From:

CISC *7210X Graph and Network Algorithms
37½ hours, plus conference and independent work; 3 credits
Data structures to represent graphs. Graph traversal algorithms. ~~Network algorithms.~~ Algorithms for constructing minimum spanning trees, shortest paths, maximum flows, and Euler and Hamilton paths. Vertex and edge coloring algorithms. Computationally hard problems, NP-completeness, and approximation algorithms.

Prerequisite: Computer and Information Science 7200X [714X]

To:

CISC *7210X Graph and Network Algorithms
37½ hours, plus conference and independent work; 3 credits
Data structures to represent graphs. Graph traversal algorithms. MST. Shortest Paths. Network flow. Algorithms for constructing minimum spanning trees, shortest paths, maximum flows, and Euler and Hamilton paths. Vertex and edge coloring algorithms. Computationally hard problems, NP-completeness, and approximation algorithms.

Prerequisite: Computer and Information Science 7200X [714X] or an undergraduate course in analysis of algorithms.

Rationale:
The change is in the prerequisite. If a student has taken a course in analysis of algorithms as an undergraduate, they will have covered many of the relevant topics needed as background for this course.

SECTION A-V: CHANGE IN AN EXISTING COURSE

Department of Computer and Information Science

Change in prerequisite

Date of departmental approval: November 10th, 2015

Effective Date: Fall, 2016

From:

CISC *7226X Information and Computation
37½ hours plus conference and independent work; 3 credits
Introduction to Shannon's information theory. Data compression algorithms: Huffman, dictionary, and predictive approaches. Techniques for different data formats. Information theory and cryptology: theoretical limits. Basic concepts of cryptology. Classic cryptography and cryptanalysis. Modern cryptographic algorithms. Information and the information environment.

Prerequisite: Computer and Information Science 7200X [714X] ~~or 7214X [715X]~~; and Mathematics 6652X [652X] or a course in probability.

To:

CISC *7226X Information and Computation
37½ hours plus conference and independent work; 3 credits
Introduction to Shannon's information theory. Data compression algorithms: Huffman, dictionary, and predictive approaches. Techniques for different data formats. Information theory and cryptology: theoretical limits. Basic concepts of cryptology. Classic cryptography and cryptanalysis. Modern cryptographic algorithms. Information and the information environment.

Prerequisite: Computer and Information Science 7200X [714X] <u>or an undergraduate course in analysis of algorithms</u>; and Mathematics 6652X [652X] or a course in probability.

Rationale:
An undergraduate course in analysis of algorithms covers many of the relevant topics needed as a prerequisite. CISC 7214X, Algorithms and Complexity, is unnecessary for this course<u>.</u>

SECTION A-V: CHANGE IN AN EXISTING COURSE

Department of Computer and Information Science

Change in prerequisite

Date of departmental approval: November 10th, 2015

Effective Date: Fall, 2016

From:

CISC *7228X Quantum Computing
37½ hours, 3 credits
An introduction to quantum computing. Basic mathematical and physical background for quantum computing. Grover's search algorithm. Shor's factoring algorithm. Quantum cryptography. Quantum complexity. Physical implementations of quantum computers.

Prerequisite: Computer and Information Science 7200X [714] ~~and a course in calculus~~.

To:

CISC *7228X Quantum Computing
37½ hours, 3 credits
An introduction to quantum computing. Basic mathematical and physical background for quantum computing. Grover's search algorithm. Shor's factoring algorithm. Quantum cryptography. Quantum complexity. Physical implementations of quantum computers.

Prerequisite: Computer and Information Science 7200X [714] or an undergraduate course in analysis of algorithms.

Rationale:
An undergraduate course in analysis of algorithms covers the relevant topics needed as a prerequisite. Calculus is not needed because every student in the master's program has to have studied calculus as a prerequisite.

SECTION A-V: CHANGE IN AN EXISTING COURSE

Department of Computer and Information Science

Change in prerequisite

Date of departmental approval: November 10th, 2015

Effective Date: Fall, 2016

From:

CISC *7230X Cryptosystems
37½ hours plus conference and independent work; 3 credits

Theoretic tools useful in the study of cryptography: number theory, algebra, probability, computational complexity. Tests for primality. Pseudo-random number generators. Public-key cryptosystems. Arthur-Merlin games and minimum- knowledge protocols.

Prerequisite: Computer and Information Science ~~7220X [722X] or 7224X [724X]~~.

To:

CISC *7230X Cryptosystems
37½ hours plus conference and independent work; 3 credits

Theoretic tools useful in the study of cryptography: number theory, algebra, probability, computational complexity. Tests for primality. Pseudo-random number generators. Public-key cryptosystems. Arthur-Merlin games and minimum- knowledge protocols.

Prerequisite: Computer and Information Science 7200X [714] or an undergraduate course in analysis of algorithms.

Rationale:
Either CISC 7200, Analysis of Algorithms, or the undergraduate course in analysis of algorithms covers the topics needed as prerequisites. CISC 7220X, Introduction to Computability and Unsolvability, and CISC 7224X, Formal Languages and Automata Theory, are not needed for the class.