SIMON FRASER UNIVERSITY

Senate Committee on University Priorities
Memorandum

TO: Senate

FROM: John Waterhouse
Chair, SCUP
Vice President, Academic

RE: Proposal for a Bachelor of Arts/
Bachelor of Science, Major or Honors in
Interactive Arts and Technology
(SCUP 05-028/ SCUP 05-029)

DATE: April 11, 2005

At its March 23, 2005 meeting SCUP reviewed and approved the proposal from the Senate Committee on Undergraduate Studies for the establishment of a Bachelor of Arts and a Bachelor of Science, Major or Honors in Interactive Arts and Technology, which is now forwarded to Senate for approval.

Motion

That Senate approve and recommend to the Board of Governors the proposal for a Bachelor of Arts, Major or Honors in Interactive Arts and Technology.

Motion

That Senate approve and recommend to the Board of Governors the proposal for a Bachelor of Science, Major or Honors in Interactive Arts and Technology.

encl.

c: J. Bowes
B. Lewis
J. Jones
R. Woodbury
J. Budd

SIMON FRASER UNIVERSI__

MEMORANDUM

To: Senate Committee on University Priorities

From: R. Blackman, Chair
Senate Committee on Undergraduate Studies

Subject: Faculty of Applied Sciences
School of Interactive Arts and Technology
(SCUS Reference: SCUS 05-8)

Date: March 17, 2005

At the SCUS meeting held on March 15, 2005, SCUS approved in principle and recommended approval by SCUP of the new Interactive Arts and Technology Undergraduate degree program.

The relevant documentation is attached for review by SCUP.

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Senate Committee on University Priorities

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From: R. Blackman, Chair
Senate Committee on Undergraduate Studies

Subject: Faculty of Applied Sciences
School of Interactive Arts and Technology
(SCUS Reference: SCUS 05-8)

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School of Interactive Arts and Technology
Undergraduate Degree Program Proposal

March 29, 2005

Preamble
The School of Interactive Arts and Technology proposes an undergraduate degree program that consists of four streams: Performance and Media Arts, Interaction Design, New Media Environments, and Technology in Art and Design. The first year of this program, TechOne, will be operated as a foundation year program administered by the Faculty of Applied Sciences in conjunction with the School.

The following statement is adapted from the draft *Academic Plan, School of Interactive Arts and Technology* prepared by T. Calvert on 8 December 2003. It is, in essence, the mission statement developed by the faculty in December 2002.

Statement of Objectives
The Interactive Arts and Technology program integrates design, arts, sciences, and information technologies to foster innovative applications of new computer technologies that respond to our wider socio-cultural context. Our undergraduate, Masters and PhD programs produce students with skills, leadership and vision. We promote the ability to analyze social, cultural, economic, aesthetic, and ethical effects of computational technologies and networked systems, alongside the ability to implement them. Our approach is designed to be broadly inclusive, and is informed by strengths in technology-mediated teaching and learning, and management for a knowledge-based economy.

Faculty and research students in Interactive Arts and Technology maintain strong research profiles. Ambitious collaborative research projects with national and international partners occur in four CFI/BCKDF funded research labs. Our interdisciplinary approach to research and teaching creates synergies with many existing programs at Simon Fraser University. By recognizing these partnerships and allowing for multiple crossover points between our School and others, we promote effective interdisciplinarity and expand the scope of education and research.

The School of Interactive Arts and Technology is unique in Canadian higher education. Graduates from our graduate and undergraduate programs will understand technologies and their contexts. They will meet a growing need in the provincial and national economies for technologically literate individuals who are also able to think critically. Through our extensive team-based learning, students will be prepared to work collaboratively with colleagues from diverse backgrounds. Our graduates will fill important roles in industry, arts, design, and government. Many will pursue graduate studies.

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Among the several interconnected goals for the School that are described in this Plan, the following are especially pertinent to the proposed undergraduate program:

- To create a place of learning that integrates design, arts, sciences and the humanities through innovation in computer mediated systems.
- To develop leading edge curricula that integrate digital art, design, performance, cultural studies, networking, computing for physical systems, software development, engineering, entrepreneurship, and knowledge management.
- To provide graduates with breadth and depth that blend scholarship with practical experience
- To explore collaborative approaches to research and curriculum development thereby building communities of reflective practice.
- To foster innovation in learning by creating an environment that accommodates change via computer-mediated and face-to-face instruction, while respecting traditional methods.
- To generate powerful synergies between curriculum evolution and faculty research.
- To promote an environment of equal opportunity, diversity, gender equality, and academic freedom and exploration.

The program described in this proposal is intended to implement these goals.

Degree Requirements for the Major Program

Students entering a Major in Interactive Arts and Technology will normally apply to either the BA or BSc program after completion of TechOne or its equivalent. Students must complete the requirements of one of the four streams in SIAT.

BSc Degree Requirements

The BSc lower division requirements, plus a combination of 30 upper division science credits.

Approved upper division science credits include the following:
- any approved upper division course in the Technology in Art & Design Stream;
- any approved upper division course in the Interaction Design Stream;
- any upper division course from Computing Science, Engineering Science, Kinesiology, Management and Systems Science, Mathematics

BA Degree Requirements

The BA lower division requirements, plus a combination of 30 upper division arts credits.

Approved upper division arts credits include the following:
- any approved upper division course in the Performance and Media Arts Stream;
- any approved upper division course in the New Media Environments Stream;

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- any upper division course from Communication, Cognitive Science, Contemporary Arts, Geography, Philosophy, Business.

Honors in Interactive Arts and Technology
An honors degree in Interactive Arts and Technology is available in all four streams: Performance and Media Arts, Interaction Design, New Media Environments and Technology in Art and Design.

Lower Division Requirements for Honors
Identical to the Major for all streams.

Upper Division Requirements for Honors.
For all streams, students must complete the requirements for a Major plus additional IAT electives for a total of at least 48 upper division credit hours. Honors students must complete the Honors Project sequence, 490-6 and 491-6. This includes an individual supervised study and research project open only to honors students.

In addition to the above, students must take sufficient unspecified upper division courses to complete a minimum of 60 upper division credit hours, and unspecified courses at any level to total 132 credit hours overall. For graduation with Honors, a 3.0 or better GPA is required on two measures: CGPA and UDGPA.

Minor in Interactive Arts and Technology
A minor in Interactive Arts and Technology is available; this is not specific to any stream.

Lower Division Requirements for a Minor
Students must complete a total of 27 credits comprised of the course requirements for TechOne plus both of: IAT 200-3, Cognition for Design Science; IAT 201-3 Usability in Interactive Environments.

Upper Division Requirements for a Minor
Students must complete 15 upper division IAT credits. It should be recognized that some upper division courses have lower division prerequisites.

Co-operative Education Program
Arrangements for work experiences are made through the school's co-op coordinators and the University's Office of Co-operative Education.

The Four Streams

The School of Interactive Arts and Technology offers a general program leading to BSc and BA degrees with major or honors in Interactive Arts and Technology. Students seeking the major or honors elect one of four streams: Performance and Media Arts, Interaction Design, New Media Environments and Technology in Art and Design.

All streams in the program share a fundamental concern with people using technology in context. Each draws from distinct patterns of scholarship and thinking—each has its own *academic emphasis*, which leads directly to its particular pattern of study and set of graduate outcomes.

Performance and Media Arts is based on the artistic interpretation and expression of human experience through interactive technological environments. This stream combines critical theory with artistic practice to produce artworks in the form of installation, performance and exhibition. Its graduates will create new forms of cultural and artistic expression in our technologically mediated society.

New Media Environments is concerned with the creation, analysis and understanding of new media. New media environments are both computational artifacts and cultural experiences. They are therefore highly emergent phenomena that are deeply rooted in historical, social, aesthetic, and economic processes. Graduates of this stream will be skilled in the critical analysis and in the making of *new media* forms such as electronic games, digital video, computer animation, and interactive multimedia.

Technology in Art and Design studies technological systems used by people in work, learning and play situations. Its emphasis is on *system-building* with particular emphasis on how people use systems, how to design and program user-centered systems and how to represent and reason about the objects and environments that people use. Its graduates will be able to make systems that people find useful and engaging.

Interaction Design examines the relationship between people and technology with the intent to enhance or improve our environment through a reflective design process that incorporates interactive technologies. The fundamental graduate outcomes are a combination of creative action and critical thought that shape the way people make and use highly interactive products, systems and environments.

The streams achieve their ends by a common curricular structure. Each has a set of *core courses* in both lower and upper division taken by all students in the stream aimed at producing specific graduate outcomes. There is significant sharing of course content among the streams, especially within the electives. Even within the sets of required courses, there is overlap reflecting the fact they are all part of a common program. The common academic threads shared by all four streams include the TechOne foundation year, four SIAT courses for the BA degree and an additional five common courses for the BSc degree.

The sections that follow contain more detailed information about the individual streams as well as the course requirements of that stream. Each stream has 30 upper division credits specified that count towards the major.

Within each stream are required core courses, stream-related electives, program-wide electives and free electives to be taken from courses outside of the program. It should be noted at the outset that wherever a list of elective courses is presented, *the actual offerings in any given year may be less than those shown*. This is in recognition of the obvious constraints that will be imposed by limited human and financial resources. It is nonetheless expected that the courses listed will be rotated over time to give students maximum opportunity to pursue their own interests within the overall program design.

Admission Requirements
Admission to the School is possible through four routes:

1. Direct admission from BC12 or equivalent high school preparation in accord with the requirements listed under the *Admission* section of the calendar.
2. Admission to the School upon completion of TechOne, the foundation year program that comprises the standard first year program.
3. Internal transfer from another SFU program upon completing requirements equivalent to those of TechOne.
4. Direct transfer from another post-secondary institution substantially meeting the requirements of TechOne.

In the case of routes 2, 3 and 4, students apply to either the BA or BSc program upon completion of at least 24 credit hours of the core lower division BA or BSc requirements listed below for admission to the respective degree program. Admission is competitive based on the student's cumulative grade point average. Students who are unsuccessful in their first admission application may improve their average by taking additional courses.

Lower Division Requirements
The lower division requirements for all planned IAT major and honors programs consist of the 21 credits of TechOne core courses (including an approved mathematics course), 12 credits of SIAT core courses, the BA or BSc requirements below plus 15 credits of lower division requirements in one of the four streams.

SIAT Lower Division Core Courses (12 credits)
The current composition of the SIAT lower division core is:
- TECH 114-3 History and Theory of Technology and Culture
- IAT 200-3 Cognition for Design Science
- IAT 201-3 Usability in Interactive Environments
- IAT/CMPT 265-3 Multimedia Programming for Art and Design

BA Lower Division Core (45 credits minimum)

In addition to the 21 credits of TechOne and 12 credits of SIAT lower division core, students must complete 12 credits from:

- PSYC 100-3 Introduction to Psychology
- IAT 204-3 Encoding Media Practice
- IAT 230-3 Design of Digital Environments
- IAT 231-3 Visualizing Interaction
- Lower division media electives (List1)
- Lower division cultural theory electives (List 2)
- Or an approved course from the School of Communication or the Faculty of Arts and Social Sciences

List 1: Media Electives:

- IAT 241-3 Animation
- IAT 242-3 Moving Images
- IAT 243-3 Sound Interaction
- IAT 244-3 Digital Photography I: Post Photography

List 2: Cultural Theory electives:

- IAT 203-3 Cultural Icons and Popular Arts
- IAT 206-3 Media Across Cultures
- IAT 209-3 Critical and Creative Thinking

BSc Lower Division Core (45 credits minimum)

In addition to the 21 credits of TechOne and 12 credits of SIAT lower division core, students must complete 12 credits from the IAT list of BSc courses currently comprising:

- CMPT 225-3 Data Structures and Programming
- MACM 101-3 Discrete Mathematics I *or* MATH 151-3 Calculus I (whichever not taken in TechOne)
- MATH 210-3 Calculus for Design Sciences
- MATH 232-3 Elementary Linear Algebra
- CMPT/IAT 261-3 Spatial Computing
- MATH 152-3 Calculus II
- IAT 232-3 Prototyping and Human factors
- STAT 270-3 Introductions to Probability and Statistics
- KIN 142-3 Introduction to Kinesiology
- PHYS 120-3 Modern Physics and Mechanics, or Physics Studio course
- or another approved course from the Faculty of Science or the Faculty of Applied Sciences.

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Performance and Media Arts

Performance and Media Arts is based on the artistic interpretation and expression of human experience through interactive technological environments. This stream combines critical theory with artistic practice to produce artworks in the form of installation, performance and exhibition. Its graduates will create new forms of cultural and artistic expression in our technologically mediated society.

Position Statement

Performance and Media Arts is based on the experience of the multi-sensory human body. The interpretation and expression of human experience at the centre of PMA occurs within interactive technological environments and is framed through a conceptual dialogue relevant to artistic practice. This stream will focus on research, practice, and theory in the areas of interactive performance, creative process, interface design, interactive environments and installations, interactive games, wearable technologies and/or other ambient technologies. The stream strives to provide a balanced understanding of the physical, artistic, cultural, social and technical issues affecting the relationship between people and rapidly evolving interactive environments.

PMA relies on methodologies from dance, theatre, installation art and physical interface design, in combination with relevant philosophical and critical discourse. This methodological approach is grounded in the application of creative and design processes relevant to contemporary interactive arts practice, experience-focused methods and innovation in the area of physical computing.

The New Media Environments, Interaction Design, and Technology in Art and Design streams provide electives and complementary experiences for PMA students. The PMA stream will, in turn, offer elective options to students from within and outside the program. Students from the PMA stream will provide a focus on art practice to balance the social, cultural and technical aspects of collaborative technology-based projects. Through the sharing of courses and expertise PMA students will build interdisciplinary knowledge and practices.

Summary of Learning Outcomes

Graduates of the PMA stream will be prepared to actively construct the next generation of embodied interfaces and cultural experiences. They will understand the creative potential of the convergence between the affective human body and interactive computational systems. Our graduates will be able to create interactive experiences that integrate live and mediated human presence, at the same time they will be able to contribute to the growing field of critical discourse around digital cultures and artifacts. Graduates will know how to work effectively in interdisciplinary team contexts on the creative development and application of interactive technologies through the use of collaborative and organizational knowledge and skills. By applying critical reflection and analysis, they will be able to balance the artistic, social, cultural and technical

implications of developing interactive performances, environments, systems, and products.

Career opportunities for graduates

Graduates of the PMA stream will build careers in interactive performance, media art, physical computing, physical interaction design, wearable device research and development, multimedia design, web design, interactive game design, and art direction and production.

Lower Division Requirements (48 credit hours minimum)

For the major, students must complete a total of 15 stream-specific credits currently comprising the following courses:
- IAT 204-3 Encoding Media Practice
- At least two Lower division media electives (List1)
- At least one Lower division cultural theory elective (List 2)

Upper Division Requirements (30 credit hours)

Students must complete all of:
- 15 credits of PMA upper division core courses, currently, IAT 301, IAT 320, IAT 321, IAT 322, IAT 323
- And at least 12 credits from the following including at least 6 credits of PMA studio courses:
- PMA studio courses: IAT 400, IAT 420, IAT 422.
- PMA elective courses: IAT 302, IAT 312, IAT 313, IAT 401, IAT 445, IAT 480, IAT 481, IAT 482.
- And SIAT upper division courses, if required, to bring the total to at least 30 credits.

Upper Division Course Descriptions:

IAT 301-3 Interactive Media Design
> Students learn physical interaction design and machine perception techniques useful in the design of audiovisual media display systems, physical installations, and mediated performance. Principles of physical interaction are explored through projects in interactive media. Readings, discussion and writing are conducted in critical issues in the historical development of interactive media including the poetics of site, space, time and technology.

IAT 320-3 Body Interface
> Body Interface explores ideas of embodiment, knowledge, and space within the human relationship to technology. Throughout this course, students will construct and analyze contemporary and historical models of bodily interaction with

machines, understand physical practices of embodiment, and apply these concepts to representation, design, and the production of artistic interface.

IAT 321-3 Kinesthetic Space

Kinesthetic Space takes an embodied approach to design and artistic practices. An understanding of kinesthesis and kinesthetic methodologies are introduced by combining theory and practice. Students use their bodies as starting points for understanding the logic of artistic, social and architectural space, plus the space of signs and devices. Their projects are based on enhanced or transformed physical and perceptual awareness, and are complemented by theoretical discourse in the area of somatics, architecture and technologically mediated space. Classes are part seminar and part physical workshop.

IAT 322-3 Current Topics in Performance and Media Studies

This senior level course addresses current topics relating to performance and media arts in the context of Interactive Arts and Technology. Practices and conceptual frameworks from academic and professional worlds of interactive art will be examined. Students will read, conceptualize and articulate debates based on their own developing interactive arts practices.

IAT 323-3 Interactive Performance and Installation

This course introduces the performing body into the context of interactive arts and technology. Students are asked to reflect upon ideas of liveness, presence, and interactivity as they create projects that take the form of interactive installation or performance. Specific contextual background includes references to the intermedia practices of 20th century artists, combined with an emphasis on improvisation and spontaneity. Performance is understood through the filter of locative media and physical and/or virtual networks. Projects combine computational and interaction models to create interactive experience.

IAT 400-3 Interdisciplinary Design Studio

Students work in teams to develop and evaluate a design addressing a complex, ill-defined problem. The actual design problems addressed vary from year to year and relate to current social and technological issues in society. The course covers the entire spectrum of the design process from problem definition to prototype and a broad range of perspectives including market feasibility, manufacturing, life-cycle implications, usability and social reception.

IAT 420-3 Exhibiting Interactive Installation and Performance Design Studio

Provides a context for students to create an installation or performance and to learn the stages and scope of professional exhibition. Working in teams, the students will learn skills for exhibiting, promoting, marketing, audience and space management, writing strategies for press, grants & conference presentations, creating a viable project web presence, plus infrastructural details such as shipping, set up and take down. After the completion of this course students will feel confident to embark upon the professional exhibition process.

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IAT 422-3 Wearing Technologies, Fabricating Experience Design Studio
Focuses on the design, fabrication and testing of prototype interactive products and systems. The thematic investigation will change each year and will focus on topics central to evolving developments in ubiquitous, mobile and wearable computing. Students will be expected to produce operational prototypes for testing and evaluation.

IAT 401-3 Electronic Culture
Electronic Culture explores the dynamics of networked culture, and related tools and practices emerging on the World Wide Web. Students study scientific models of emergence, networks, and complexity, and use them to investigate networked social forms and the cultures that surround them. These include the subcultures of wikis, weblogs, and open source, and networked authoring tools and skills associated with them. Research extends to broader societal trends including the accelerating pace of change, disruptive technologies, "smart mobs," netwar, and "netdemocracy." Software diagramming tools are used to visualize and investigate networks and complex systems.

IAT 480-3 Special Topics in Interactive Arts and Technology (Arts)
This course number has been allocated for Special Projects in the School of Interactive Arts and Technology. Specific details of courses to be offered will be published prior to registration each semester.

IAT 481-3 Special Topics in Interactive Arts and Technology (Science)
This course number has been allocated for Special Projects in the School of Interactive Arts and Technology. Specific details of courses to be offered will be published prior to registration each semester.

IAT 482-3 Special Topics in Performance and Media Arts
A specific set of debates or practices alive and relevant to the professional interactive arts world will be selected to form the basis of this course. Students will be guided as they research with considerable depth the topic(s) from the perspective both of practice and theoretical discourse. Emphasis will be placed upon the conceptualization and articulation of their own views. A seminar format will be used, and assessment can be based on practice and/or written research.

New Media Environments Stream

The New Media Environments stream is concerned with the creation, analysis and understanding of new media. New media environments are both computational artifacts and cultural experiences. They are therefore highly emergent phenomena that are deeply rooted in historical, social, aesthetic, and economic processes. Graduates of this stream will be skilled in the critical analysis and in the making of new media forms such as electronic games, digital video, computer animation, and interactive multimedia.

Position Statement

The New Media Environment stream is concerned with the creation, analysis, and understanding of new media. New media sits at the intersection of computation and culture. As a consequence new media artifacts, environments, and experiences are emergent phenomena. The NME stream recognizes that this state of emergence is, and will continue to be, an ongoing characteristic of digital media. At the same time, we see that new media are deeply rooted in historical, cultural, social, and economic processes. Our approach combines the creation of new media art with the understanding of media artifacts and environments within broader cultural contexts.

This stream is complementary to the Interaction Design and the Performance and Media Art streams. The three streams share specific courses, skills and processes, and a common commitment to the importance of both creation and understanding. Jointly, the three streams define a comprehensive look at the design and the experience of computational art and media. The situation of these streams within the Interactive Arts and Technology program provides a strong framework for the technological and social foundations of all three streams.

Summary of Learning Outcomes

Graduates of the NME stream will be accomplished in a range of digital arts, including the use of image and sound, interface and interactive design, the application of encoded media practice, and the construction of networked environments and communities. NME students will produce works in a variety of media disciplines, including sound works, still images, moving images, digital animations, virtual and data worlds, simulations, and games. Each graduate will demonstrate competence in all these disciplines, and will be required to produce exemplary works that combine higher order conceptual and production skills. They will be able to analyze and discuss their own and other works within a broader cultural and social context. Finally, they will be capable of incorporating new and emergent digital media skills and capabilities within their own ongoing practice.

Career opportunities for graduates

Graduates of the NME stream will build careers in a wide range of interactive multimedia design and production areas, including new media production, game design, web development, and the construction of virtual networked environments.

Lower Division Requirements (48 credit hours minimum)

For the major, students must complete 15 credits of stream-specific courses, currently comprising the following:

- IAT 204-3
- At least two lower division media electives (List1)
- At least one lower division cultural theory electives (List 2)

Upper Division Requirements (30 credit hours)
Students must complete all of:
- 15 credits of NME upper division core courses, currently IAT 301, IAT 312, IAT 313, IAT 410 and IAT 445.
- And at least 12 credits from the following, including at least 9 credits of NME studio courses:
- NME Studio courses: IAT 340, IAT 400, IAT 342 and IAT 443
- NME elective courses: IAT 302, IAT 320, IAT 430, IAT 480, IAT 481, IAT 483
- And SIAT upper-division courses, if required, to bring the total to at least 30 credits.

Upper Division Course Descriptions:

IAT 301-3 Interactive Media Design
>   Students learn programming and machine perception techniques useful in the design of audiovisual media display systems. Readings, discussion and writing are conducted in critical issues in the historical development of interactive media including the poetics of site, space, time and technology.

IAT 312-3 Foundations of Game Design
>   Includes the fundamentals of game design and the analysis of game experience. It will examine game as a set of rules, game as the experience of play, and game as a culturally situated phenomenon. Students will analyze and produce a wide range of games in both electronic and non-electronic media.

IAT 313-3 Narrative and New Media
>   Examines the design and the experience of narrative and story. It includes foundation principles and concepts from traditional linear narrative forms. The course extends these narrative concepts to multi-linear and to networked narrative forms. Students will analyze and produce both linear and multi-linear narrative works.

IAT 410-3 Advanced Game Design
>   Involves further work in the production and analysis of electronic games. Students will review a variety of electronic game forms, and will analyze a series of games from the perspective of game design theory and interactive multi-mediated experience. Students will produce a series of short game exercises and one term-project final game.

IAT 445-3 Immersive Environments
>   Introduces students to both physical and virtual immersive environments and worlds. A large range of immersive possibilities will be explored as to both define immersive space and to begin to understand how to author immersive systems. Once fundamentals are established the planning and execution stage begins where

students will explore real-time dramatic performance art in immersive environments. This course culminates in a public interactive narrative performance or product. In this course we design, script, create actor roles, build 3d immersive sets, rehearse and document the plan of our class conceived immersive performance that delves into the blurring definitions of author and audience, fact and fiction, physical and virtual.

IAT 340-3 Experimental Sound Design Studio

Advanced techniques in real-time audio digital signal processing appropriate for game development and virtual environments are explored including interactive speech, music and sound effects. Students will design and build dynamic, navigable and immersive aural settings embedded in 3D graphic environments.

IAT 342-3 Animated Image Design Studio

Building on skills learned in the IAT 241 Animation course, the "Animated Image" introduces non-programming advanced 3D computer animation techniques. The course mixes 1) hands-on studio-based projects and 2) a non-technical survey of computer animation research areas. The studio track culminates in a team-based animation project where students use their 3D animation skills and artistic knowledge to create a linear or interactive project such as a short film, 3D world, or interactive game or visualization. The conceptual track surveys current research topics in computer animation such as facial animation, behavioral animation, artificial life and interactive systems.

IAT 400-3 Interdisciplinary Design Studio

Students work in teams to develop and evaluate a design addressing a complex, ill-defined problem. The actual design problems addressed vary from year to year and relate to current social and technological issues in society. The course covers the entire spectrum of the design process from problem definition to prototype and a broad range of perspectives including market feasibility, manufacturing, life-cycle implications, usability and social reception.

IAT 443-3 Interactive Image, Sound and Motion Design Studio

An intermediate level investigation of interactivity explored through media, in the context of current display technologies relevant to Interactive Arts and Design. Examines the computational and compositional structures related to image, sound and video, including 3D animation. Students explore real-time interaction and representation within a range of display scales ranging from cell phone, PDA to larger scale displays such as CAVE environments. Students will design, produce and critically appraise works within responsive interactive environments. Project context could vary from mobile locative media to immersive VR spaces.

IAT 483-3 Special Topics in New Media Environments

A specific set of debates or practices alive and relevant to the professional new media world will be selected to form the basis of this course. Students will be guided as they research with considerable depth the topic(s) from the perspective

both of practice and theoretical discourse. Emphasis will be placed upon the conceptualization and articulation of their own views. A seminar format will be used, and assessment can be based on practice and/or written research

Technology in Art and Design Stream

Technology in Art and Design studies technological systems used by people in work, learning and play situations. Its emphasis is on *system-building* with particular emphasis on how people use systems, how to program user-centered systems and how to represent and reason about the objects and environments that people use. Its graduates will be able to make systems that people find useful and engaging. Students should note that there is a four course, lower level math requirement and a four course, lower level computing requirement that must be satisfied for graduation. Some of these courses are prerequisites to second year courses; others may be taken at any point in the program.

Position Statement

Technology in Art and Design studies systems that combine people, computation and the physical world. It is a design field – it aims at both understanding such systems and creating new systems that are useful in their contexts. The essential core of its education is a combination of creative action and critical thought.

The stream makes four educational commitments beyond those of a general university degree: *people, systems, design process,* and *modeling.*

By *people* we mean the study of how people use technology to learn, think, and play. *Systems* identifies the historical development and technical structure of systems combining people, computation and the world. Students learn *design process* by doing design work and by study of existing design processes and theories. *Modeling* is the act of creating representations suitable for designing systems. It includes representations for space, artifacts, and processes. Its tools include computer-aided design systems, physical prototyping, programming and applied mathematics.

Summary of Learning Outcomes

Graduates of this stream will be able to think critically and act creatively in developing technology for people in their contexts. They will have a fundamentally scientific outlook, tempered by exposure to other academic traditions. Graduates will have broad competencies as follows: (1) to develop and evaluate systems that support learning, thinking and play; (2) to model virtual and physical environments; (3) to design and evaluate human-computer interfaces and other highly interactive systems; and (4) to work effectively on technology projects requiring interaction with participants from diverse backgrounds. We expect that the core skills acquired by students will be broadly marketable and of particular value in creative industries.

Career opportunities for graduates

Arts and Design Technology graduates will be well-prepared to design, implement and evaluate systems for people, including: multimedia systems, interactive products, physical interfaces, web sites, computer games, online learning systems, and computer-aided design. They will be well prepared for leadership responsibilities and for further professional/academic study in related disciplines.

Lower Division Requirements (48 credit hours minimum)

For the major, students must complete 15 credits of stream-specific courses currently comprising the following:

- CMPT 225-3 Data Structures and Programming
- CMPT/IAT 261-3 Spatial Computing
- MACM 101-3 Discrete Mathematics I *or* MATH 151-3 Calculus I (whichever not taken in TechOne)
- MATH 210-3 Calculus for Design Sciences
- MATH 232-3 Elementary Linear Algebra

Upper Division Requirements (30 credit hours)

Students must complete all of:

- 15 credits of TAD upper division core courses, currently: an approved project management course (for AY 2005-6, BUS 492 Special Topics); IAT 351; IAT 352; IAT 451; IAT 452.
- And at least 12 credits from the following including at least 9 credits of TAD studio courses:
- TAD Studio Courses: IAT 353, IAT 354, IAT 453, and IAT 454
- TAD Elective courses: IAT 301, IAT 302, IAT 312, IAT 401, IAT 410, IAT 430, IAT 480, IAT 481, IAT 484
- And SIAT upper-division courses, if required, to bring the total to 30 credits.

Upper Division Course Descriptions

IAT 351-3 Interaction Technology

> Key areas of technology for supporting user interaction with systems in work, learning and play are introduced, employing tactile, aural, and visual senses of humans. Technologies used in sensors and actuators for robotic systems are reviewed for their applicability to user-centered interaction.

IAT 352-3 Knowledge Media

> An introduction to knowledge media as the study of how people design, create and use technologies that convey knowledge. The emphasis is on how such media support people in work and learning contexts. A range of technologies is treated in a comparative manner, addressing both utility for intended tasks and design and

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implementation. Particular topics include comparison of humanistic and technological views of knowledge; group creation of knowledge; visualization and visual inference; user modeling; collaboration and supporting technologies; computer-supported cooperative work; participatory design; and knowledge networks and communities.

IAT 451-3 Design of Ubiquitous Environments

Ubiquitous environments are those in which information and control services are available for casual use. The design of such environments requires in-depth understanding of patterns of use, user-centered design processes and knowledge of enabling technologies. This course covers all three areas, with particular emphasis on how technologies enable human action. The well-known example of a smart house is used to motivate and demonstrate how ubiquity can act as a design principle.

IAT 452-3 Design Environments

The domain of concern for this course is representation authoring in design, where "design" is taken broadly as a process of making proposals for change. It uses specific advanced design systems as cases, for example, drawing systems, parametric modeling systems and games authoring environments.

IAT 353-3, IAT 354-3, IAT 453-3 and IAT 454-3 Human-Centered Systems Design Studio Courses I, II, III and IV.

These are four core upper division design studio courses in the Technology in Art and Design (TAD) Stream. Their aim is the acquisition of relevant knowledge and skill in designing, implementing and evaluating human-centered systems. Each of the four courses has similar structure: workshops around key issues arising in the particular human-centered system being designed and a semester-long project with multiple milestones as the primary assessment device.

IAT 484-3 Special Topics in Technology in Art and Design

A specific set of debates or practices alive and relevant to the professional technology and art in design world will be selected to form the basis of this course. Students will be guided as they research with considerable depth the topic(s) from the perspective both of practice and theoretical discourse. Emphasis will be placed upon the conceptualization and articulation of their own views. A seminar format will be used, and assessment can be based on practice and/or written research.

Interaction Design Stream

Interaction Design examines the relationship between people and technology with the intent to enhance or improve our environment through a reflective design process that incorporates interactive technologies. The fundamental graduate outcomes are a combination of creative action and critical thought that shape the way people make and use highly interactive products, systems and environments.

Position Statement
The Interaction Design stream will prepare students to work effectively as future designers who will address the requirements of a new generation of interactive systems, services and events that are designed from the outset to address the needs of real people in everyday situations.

The course curriculum is structured to balance the social, cultural, aesthetic and technical issues that surround the potential offered by advanced technologies with the practical realities of prototyping and user field-testing to ensure solutions adequately address human-centered concerns. Core competencies in human-centered design, designing with interactive technology, design theory and interaction design process and skills lead to specialty strengths in ambient technologies, interactive products, wearable computing and interactive environments. These skills are built through the learning of design-related cognitive science, human computer interaction, communication in design, experience design, human factors and human-centered design methods. Design principles are addressed in such course offerings as: interaction and reception, design evaluation, design research and advanced interaction in design. Students will acquire prototyping abilities based on a combination of media, computational and visualizing skills in order to analyze, model, and design complex interaction situations. Throughout the curriculum we emphasize the central role consumers or users play in the design process.

The New Media Environments, Performance and Media Arts, and Technology in Art and Design streams provide electives and complementary experiences for Interaction Design students. Shared courses and faculty expertise build interdisciplinary knowledge and practices.

Summary of Learning Outcomes
Graduates will be able to create effective interactive experiences through design. In doing so, they will develop important secondary skills: understanding interactive technologies, working effectively in team-based environments and realizing the social implications of their designs. More specifically, a graduate in interaction design will demonstrate proficiency in: designing interfaces, developing a design process, analyzing interactive products & systems, and in assessing interactive environments, interactive games, and ambient technologies.

Career Opportunities for Graduates
Graduates of Interaction Design will be leaders in interactive product research and development, context-based experience design, multimedia design, web design, interactive game design, art direction, and project management. They will be well prepared for leadership responsibilities and for further professional/academic study in related disciplines.

Lower Division Requirements

For the major, students must complete 15 stream-specific credits currently comprising the following:

- 9 credits of ID core lower division courses: IAT 230, 231, and 232.
- And six credits from the following courses: PSYC 100, KIN 142, CMPT 225, STAT 270.
- One lower division cultural theory elective from List 2.

Upper Division Requirements (30 credit hours)

Students must complete all of:

- At least 18 credits from ID upper division courses currently comprising: IAT 302, 331, 332, 333, 335, 338, 430, 431.
- And at least 9 credits from the following, including at least 6 credits of IAD studio courses:
- ID studio courses: IAT 400, 411, 412.
- ID electives: IAT 301, 312, 313, 391, 392, 393, 394, 401, 410, 480, 481, 485.
- And SIAT upper-division courses, if required, to bring the total to at least 30 credits.

Upper Division Course Descriptions

IAT 302-3 Cognition in Interactive Environments

Examines aspects of psychology and cognitive science that can inform the design and testing of this large and growing class of interfaces: VR, AR, ambient intelligence/ubiquitous/mobile computing, public and situated displays, etc. These methods extend HCI to create a complex systems approach to high-bandwidth human computer interaction design. Topics covered include Marr's computational theoretic, algorithm, and implementation levels of analysis, human cognitive architecture and models of embodied, enactive and distributed cognition. Methods discussed include cognitive architecture-based task analysis, linear and nonlinear dynamics modeling, toy world study methodologies, and mixed qualitative/quantitative research methods.

IAT 331-3 Interaction and Reception

Explores the relationship between designed products, services, and systems, and the larger context in which design operates. Design is considered as a form of language that can be analyzed using ethnography and cultural theory. Once design is understood as a language, we turn to the contexts for the use of design and explore what languages form the reception and interactive sites for cultural communication and meaning achievable through design.

IAT 332-3 Interaction Design Evaluation

Examines evaluation concepts and methods for interaction designers. The course analyzes the range of evaluation approaches including informal evaluation,

usability, field studies, heuristics, critique and discursive evaluation. Students will explore techniques for feedback including observation, interviews, expert reviews, use experience, modeling, and critical analysis. Underlying concepts of evaluation including scientific observation, ethnography, phenomenology, and aesthetics will be discussed. Students will learn how to design and implement appropriate evaluation studies for a range of ubiquitous computing environments.

IAT 333-3 Interaction Design Praxis: Practice and Methods

Examines concepts of design practice and related design methods for interaction designers. Students will be introduced to concepts of practice such as reflective practice, embodied interaction and pattern language. Students will review a range of methods focused on conceptualization, use experience, situated use, and prototyping, including scenarios, role-playing, participatory design, ethno-methodologies and the use of prototypes. In addition to readings, students will engage in exploratory design method projects.

IAT 335-3 Analysis of Design Situations

Examines methods for analyzing and gathering requirements for design situations as they relate to the range of ubiquitous computing applications. The course will examine the conceptual frameworks for understanding human activity and design situations. Students will review a range of methods for requirements gathering, interviews, observation, and ethnographic and ethno-methodological techniques. Students will also study qualitative, quantitative, and interpretive modes of analysis of data and how to support design with these findings. Students will engage in a range of case-stories and projects focused on user analysis.

IAT 338-3 Interactive Prototypes

Develops combined software, hardware and prototype versions of interactive products and systems. The emphasis will be the application of software tools such as MAX and Flash that enable students to develop working prototypes of their projects for design and testing. Types of projects will include software, interactive systems, network and web-based systems, wearables, and mobile devices.

IAT 430-3 Design Research

Explores how the practice of design helps to explain the world around us or how we can find ways to improve the way we design. This course introduces the importance of design research. Students will review case-stories of research problems in design, research methods relevant to design, and how to present research outcomes. Students will be expected to explore and complete their own research investigation into a design-related research problem.

IAT 431-3 Advanced Topics in Interaction Design

Allows for in-depth exploration of a specific design, cultural and/or social theme and its impact on design. The thematic investigation will change each year and will focus on topics not typically covered elsewhere in the Interaction Design

curriculum. Possible themes include sustainability, design for developing nations, globalization and localization, and other relevant or prescient issues.

IAT 400-3 Interdisciplinary Design Studio
Students work in teams to develop and evaluate a design addressing a complex, ill-defined problem. The actual design problems addressed vary from year to year and relate to current social and technological issues in society. The course covers the entire spectrum of the design process from problem definition to prototype and a broad range of perspectives including market feasibility, manufacturing, life-cycle implications, usability and social reception.

IAT 411-3 Ubiquitous, Mobile & Wearable Computing Design Studio I
Focuses on the design, fabrication and testing of prototype interactive products and systems. The thematic investigation will change each year and will focus on topics central to evolving developments in ubiquitous, mobile and wearable computing. Students will be expected to produce operational prototypes for testing and evaluation.

IAT 412-3 Ubiquitous, Mobile & Wearable Computing Design Studio II
Focuses on the design, fabrication and testing of prototype interactive products and systems. The thematic investigation will change each year and will focus on topics central to evolving developments in ubiquitous, mobile and wearable computing. Students will be expected to produce operational prototypes for testing and evaluation.

IAT 391-1 Italian Design History
This course is part of the 9-12 credit Italia*Design* Field School curriculum. The first course of four is taught in Vancouver 5 weeks prior to departure for Italy. Students prepare research plans for use once they arrive at each of four destinations (Rome, rural Tuscany, Florence, Milan). The course covers histories of city planning, architecture and urban design in these venues that live on in contemporary Italian design.

IAT 392-3 Italian Design in Context
This course is part of the 9-12 credit Italia*Design* Field School curriculum. Field school instruction is in three phases: (1) Vancouver: methodology and preparatory research work; (2) field study on-site in Italy, and - upon return to Vancouver - (3) synthesis and writing-up of research and final arguments. This course fulfils one half of phase 2 fieldwork in Italy.

IAT 393-3 Interaction Design Workshop I
Part of the 9-12 credit Italia*Design* Field School curriculum. Projects are completed in Florence and Milan. Students read, are examined on, and then apply findings into an ethnographic analysis - a study of the people and city of Florence as exemplars of "brand Italia". The second study takes place in Milan, where students examine the particularities of the Milanese context and particularly

Northern Italian Industrial innovation practices. Italy is presented as a potential model of "knowledge economy" from which Canada and specifically British Columbia can "learn". Activities in Milan are framed by a series of tours and talks by leading contemporary design firms, distributors and manufacturers. The course asks: "Why is Italian Design so successful? How is design tied to culture? How is the Italian landscape for design different from the Canadian context?

IAT 394-3 Interaction Design Workshop II

Part of the 9-12 credit Italia*Design* Field School curriculum, this is an optional fourth course and directed study option. Participants propose a topic to the Field School instruction team prior to departure to Italy and sharpen their focus as other studies impact on assumptions. Students can work individually or in teams on research or applied projects. Topics must be approved by the instructor(s). Research must also complement the ongoing Italia*Design* repository project. Projects focus on furthering knowledge of Italian Design and Innovation practices and extending the course concepts.

IAT 485-3 Special Topics in Interaction Design

A specific set of debates or practices alive and relevant to the professional interactive design world will be selected to form the basis of this course. Students will be guided as they research with considerable depth the topic(s) from the perspective both of practice and theoretical discourse. Emphasis will be placed upon the conceptualization and articulation of their own views. A seminar format will be used, and assessment can be based on practice and/or written research.

School of Interactive Arts and Technology
Calendar Listing

March 29, 2005

Preamble
The School of Interactive Arts and Technology proposes an undergraduate degree program that consists of four streams: Performance and Media Arts, Interaction Design, New Media Environments, and Technology in Art and Design. The first year of this program, TechOne, will be operated as a foundation year program administered by the Faculty of Applied Sciences in conjunction with the School.

Degree Requirements for the Major Program
Students entering a Major in Interactive Arts and Technology will normally apply to either the BA or BSc program after completion of TechOne or its equivalent. Students must complete the requirements of one of the four streams in SIAT.

BSc Degree Requirements
The BSc lower division requirements, plus a combination of 30 upper division science credits.

Approved upper division science credits include the following: any approved upper division course in the Technology in Art & Design Stream; any approved upper division course in the Interaction Design Stream; any upper division course from Computing Science, Engineering Science, Kinesiology, Management and Systems Science, Mathematics

BA Degree Requirements
The BA lower division requirements, plus a combination of 30 upper division arts credits.

Approved upper division arts credits include the following: any approved upper division course in the Performance and Media Arts Stream; any approved upper division course in the New Media Environments Stream; any upper division course from Communication, Cognitive Science, Contemporary Arts, Geography, Philosophy, Business.

Honors in Interactive Arts and Technology
An honors degree in Interactive Arts and Technology is available in all four streams: Performance and Media Arts, Interaction Design, New Media Environments and Technology in Art and Design.

Lower Division Requirements for Honors
Identical to the Major for all streams.

Upper Division Requirements for Honors.

For all streams, students must complete the requirements for a Major plus additional IAT electives for a total of at least 48 upper division credit hours. Honors students must complete the Honors Research Project sequence, 490-6 and 491-6. This is an individual supervised study and research project open only to honors students.

In addition to the above, students must take sufficient unspecified upper division courses to complete a minimum of 60 upper division credit hours, and unspecified courses at any level to total 132 credit hours overall. For graduation with Honors, a 3.0 or better GPA is required on two measures: CGPA and UDGPA.

Minor in Interactive Arts and Technology
A minor in Interactive Arts and Technology is available; this is not specific to any stream.

Lower Division Requirements for a Minor
Students must complete a total of 27 credits comprised of the course requirements for TechOne plus both of: IAT 200-3, Cognition for Design Science; IAT 201-3, Usability in Interactive Environments.

Upper Division Requirements for a Minor
Students must complete 15 upper division IAT credits. It should be recognized that some upper division courses have lower division prerequisites.

Co-operative Education Program
Arrangements for the work experiences are made through the school's co-op coordinators and the University's Office of Co-operative Education.

The Four Streams
Until now, SIAT has offered *Information Technology* and *Interactive Arts* programs, the latter divided into *Performance & Media Art* and *Interaction Design* streams. Now the Information Technology program is being phased out and will be replaced, in part, by a new *Technology in Art and Design* stream. The other two streams, meanwhile, have been extensively revised, and out of that work has evolved a new, related fourth stream: *New Media Environments*.

The School of Interactive Arts and Technology offers a general program leading to BSc and BA degrees with major or honors in Interactive Arts and Technology. Students seeking the major or honors elect one of four streams: Performance and Media Arts, Interaction Design, New Media Environments and Technology in Art and Design.

All streams in the program share a fundamental concern with people using technology in context. Each draws from distinct patterns of scholarship and thinking—each has its own *academic emphasis*, which leads directly to its particular pattern of study and set of graduate outcomes.

Performance and Media Arts is based on the artistic interpretation and expression of human experience through interactive technological environments. This stream combines critical theory with artistic practice to produce artworks in the form of installation, performance and exhibition. Its graduates will create new forms of cultural and artistic expression in our technologically mediated society.

New Media Environments is concerned with the creation, analysis and understanding of new media. New media environments are both computational artifacts and cultural experiences. They are therefore highly emergent phenomena that are deeply rooted in historical, social, aesthetic, and economic processes. Graduates of this stream will be skilled in the critical analysis and in the making of *new media* forms such as electronic games, digital video, computer animation, and interactive multimedia.

Technology in Art and Design studies technological systems used by people in work, learning and play situations. Its emphasis is on *system-building* with particular emphasis on how people use systems, how to design and program user-centered systems and how to represent and reason about the objects and environments that people use. Its graduates will be able to make systems that people find useful and engaging.

Interaction Design examines the relationship between people and technology with the intent to enhance or improve our environment through a reflective design process that incorporates interactive technologies. The fundamental graduate outcomes are a combination of creative action and critical thought that shape the way people make and use highly interactive products, systems and environments.

The streams achieve their ends by a common curricular structure. Each has a set of *core courses* in both lower and upper division taken by all students in the stream aimed at producing specific graduate outcomes. There is significant sharing of course content among the streams, especially within the electives. Even within the sets of required courses, there is overlap reflecting the fact they are all part of a common program. The common academic threads shared by all four streams include the TechOne foundation year, four SIAT courses for the BA degree and an additional five common courses for the BSc degree.

The sections that follow contain more detailed information about the individual streams as well as the course requirements of that stream. Each stream has 30 upper division credits specified that count towards the major.

Within each stream are required core courses, stream-related electives, program-wide electives and free electives to be taken from courses outside of the program. It should be noted at the outset that wherever a list of elective courses is presented, *the actual offerings in any given year may be less than those shown*. This is in recognition of the obvious constraints that will be imposed by limited human and financial resources. It is nonetheless expected that the courses listed will be rotated over time to give students maximum opportunity to pursue their own interests within the overall program design.

Admission Requirements
Admission to the School is possible through four routes:

1. Direct admission from BC12 or equivalent high school preparation in accord with the requirements listed under the *Admission* section of the calendar.
2. Admission to the School upon completion of TechOne, the foundation year program that comprises the standard first year program.
3. Internal transfer from another SFU program upon completing requirements equivalent to those of TechOne.
4. Direct transfer from another post-secondary institution substantially meeting the requirements of TechOne.

In the case of routes 2, 3 and 4, students apply to either the BA or BSc program upon completion of at least 24 credit hours of the core lower division BA or BSc requirements listed below for admission to the respective degree program. Admission is competitive based on the student's cumulative grade point average. Students who are unsuccessful in their first admission application may improve their average by taking additional courses.

Lower Division Requirements
The lower division requirements for all planned IAT major and honors programs consist of the 21 credits of TechOne core courses (including an approved mathematics course), 12 credits of SIAT core courses, the BA or BSc requirements below plus 15 credits of lower division requirements in one of the four streams.

SIAT Lower Division Core Courses (12 credits)

The current composition of the SIAT lower division core is:
- TECH 114-3 History and Theory of Technology and Culture
- IAT 200-3 Cognition for Design Science
- IAT 201-3 Usability in Interactive Environments
- IAT/CMPT 265-3 Multimedia Programming for Art and Design

BA Lower Division Core (45 credits minimum)
In addition to the 21 credits of TechOne and 12 credits of SIAT lower division core, students must complete 12 credits from:
- PSYC 100-3 Introduction to Psychology
- IAT 204-3 Encoding Media Practice
- IAT 230-3 Design of Digital Environments
- IAT 231-3 Visualizing Interaction
- Lower division media electives (List1)
- Lower division cultural theory electives (List 2)
- Or an approved course from the School of Communication or the Faculty of Arts and Social Sciences

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List 1: Media Electives:
- IAT 241-3 Animation
- IAT 242-3 Moving Images
- IAT 243-3 Sound Interaction
- IAT 244-3 Digital Photography I: Post Photography

List 2: Cultural Theory electives:
- IAT 203-3 Cultural Icons and Popular Arts
- IAT 206-3 Media Across Cultures
- IAT 209-3 Critical and Creative Thinking

BSc Lower Division Core (45 credits minimum)
In addition to the 21 credits of TechOne and 12 credits of SIAT lower division core, students must complete 12 credits from the IAT list of BSc courses currently comprising:
- CMPT 225-3 Data Structures and Programming
- MACM 101-3 Discrete Mathematics I *or* MATH 151-3 Calculus I (whichever not taken in TechOne)
- MATH 210-3 Calculus for Design Sciences
- MATH 232-3 Elementary Linear Algebra
- CMPT/IAT 261-3 Spatial Computing
- MATH 152-3 Calculus II
- IAT 232-3 Prototyping and Human factors
- STAT 270-3 Introductions to Probability and Statistics
- KIN 142-3 Introduction to Kinesiology
- PHYS 120-3 Modern Physics and Mechanics, or Physics Studio course
- or another approved course from the Faculty of Science or the Faculty of Applied Sciences.

Performance and Media Arts

Performance and Media Arts is based on the artistic interpretation and expression of human experience through interactive technological environments. This stream combines critical theory with artistic practice to produce artworks in the form of installation, performance and exhibition. Its graduates will create new forms of cultural and artistic expression in our technologically mediated society.

Lower Division Requirements (48 credit hours minimum)
For the major, students must complete a total of 15 stream-specific credits currently comprising the following courses:
- IAT 204-3 Encoding Media Practice
- At least two Lower division media electives (List1)
- At least one Lower division cultural theory elective (List 2)

Upper Division Requirements (30 credit hours)
Students must complete all of:

- 15 credits of PMA upper division core courses, currently IAT 301, IAT 320, IAT 321, IAT 322, IAT 323

And at least 12 credits from the following including at least 6 credits of PMA studio courses:
- PMA studio courses: IAT 400, IAT 420, IAT 422.
- PMA elective courses: IAT 302, IAT 312, IAT 313, IAT 401, IAT 445, IAT 480, IAT 481, IAT 482.

And SIAT upper division courses, if required, to bring the total to at least 30 credits.

New Media Environments Stream

The New Media Environments stream is concerned with the creation, analysis and understanding of new media. New media environments are both computational artifacts and cultural experiences. They are therefore highly emergent phenomena that are deeply rooted in historical, social, aesthetic, and economic processes. Graduates of this stream will be skilled in the critical analysis and in the making of new media forms such as electronic games, digital video, computer animation, and interactive multimedia.

Lower Division Requirements (48 credit hours minimum)

For the major, students must complete 15 credits of stream-specific courses, currently comprising the following:
- IAT 204-3
- At least two lower division media electives (List1)
- At least one lower division cultural theory electives (List 2)

Upper Division Requirements (30 credit hours)

Students must complete all of:
- 15 credits of NME upper division core courses, currently IAT 301, IAT 312, IAT 313, IAT 410 and IAT 445.

And at least 12 credits from the following, including at least 9 credits of NME studio courses:
- NME Studio courses: IAT 340, IAT 400, IAT 342 and IAT 443
- NME elective courses: IAT 302, IAT 320, IAT430, IAT 480, IAT 481, IAT 483

And SIAT upper-division courses, if required, to bring the total to at least 30 credits.

Technology in Art and Design Stream

Technology in Art and Design studies technological systems used by people in work, learning and play situations. Its emphasis is on *system-building* with particular emphasis on how people use systems, how to program user-centered systems and how to represent and reason about the objects and environments that people use. Its graduates will be able to make systems that people find useful and engaging. Students should note that there is a four course, lower level math requirement and a four course, lower level computing requirement that must be satisfied for graduation. Some of these courses are prerequisites to second year courses; others may be taken at any point in the program.

Lower Division Requirements (48 credit hours minimum)

For the major, students must complete 15 credits of stream-specific courses currently comprising the following:

- CMPT 225-3 Data Structures and Programming
- CMPT/IAT 261-3 Spatial Computing
- MACM 101-3 Discrete Mathematics I *or* MATH 151-3 Calculus I (whichever not taken in TechOne)
- MATH 210-3 Calculus for Design Sciences
- MATH 232-3 Elementary Linear Algebra

Upper Division Requirements (30 credit hours)

Students must complete all of:

- 15 credits of TAD upper division core courses, currently: an approved project management course (for AY 2005-6, BUS 492 Special Topics); IAT 351; IAT 352; IAT 451; IAT 452

And at least 12 credits from the following including at least 9 credits of TAD studio courses:

- TAD Studio Courses: IAT 353, IAT 354, IAT 453, and IAT 454
- TAD Elective courses: IAT 301, IAT 302, IAT 312, IAT 401, IAT 410, IAT 430, IAT 480, IAT 481, IAT 484

And SIAT upper-division courses, if required, to bring the total to 30 credits.

Interaction Design Stream

Interaction Design examines the relationship between people and technology with the intent to enhance or improve our environment through a reflective design process that incorporates interactive technologies. The fundamental graduate outcomes are a combination of creative action and critical thought that shape the way people make and use highly interactive products, systems and environments.

Lower Division Requirements (48 credit hours minimum)

For the major, students must complete 15 stream-specific credits currently comprising the following:

- 9 credits of ID core lower division courses: IAT 230, IAT 231, and IAT 232.
- And six credits from the following courses: PSYC 100, KIN 142, CMPT 225, STAT 270.
- One lower division cultural theory elective from List 2.

Upper Division Requirements (30 credit hours)

Students must complete all of:

- At least 18 credits from ID upper division courses currently comprising: IAT 302, IAT 331, IAT 332, IAT 333, IAT 335, IAT 338, IAT 430, IAT 431.

And at least 9 credits from the following, including at least 6 credits of IAD studio courses:

- IAD studio courses: IAT 400, IAT 411, IAT 412.
- IAD electives: IAT 301, IAT 312, IAT 313, IAT 391, IAT 392, IAT 393, IAT 394, IAT 401, IAT 410, IAT 480, IAT 481, IAT 485.

- And SIAT upper-division courses, if required, to bring the total to at least 30 credits.

NOTE: The fifty new 300 and 400 upper division courses were previously
      approved by SCUS/Senate – See Senate paper S.05-59 (S.M. 4 April 2005)

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