

### Faculty

#### Chair

PK LANGSHAW, MFA *Université du Québec à Montréal*; Professor

#### Professors

JASON EDWARD LEWIS, MPhil *Royal College of Art*; *Concordia Research Chair*

RHONA RICHMAN KENNEALLY, PhD *McGill University*

CHRISTOPHER SALTER, PhD *Stanford University*; *Concordia Research Chair*

#### Associate Professors

JOANNA BERZOWSKA, MSc *Massachusetts Institute of Technology*

CARMELA CUCUZZELLA, PhD *Université de Montréal*; *Concordia Research Chair*

RILLA KHALED, PhD *Victoria University of Wellington*

CHRISTOPHER MOORE, MFA *Nova Scotia College of Art and Design*

MARTIN RACINE, PhD *Université de Montréal*

M. WRIGHT, MFA *School of the Art Institute of Chicago*

#### Assistant Professors

PIPPIN BARR, PhD *Victoria University of Wellington*

JONATHAN LESSARD, PhD *Université de Montréal*

*For the complete list of faculty members, please consult the Department website.*

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### Location

*Sir George Williams Campus*

Engineering, Computer Science and Visual Arts Complex, Room: EV 6.761

514-848-2424, ext. 4626

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### Department Objectives

The Department offers programs that examine the broad vision or culture of design within contemporary society.

The Design Major is located primarily within the disciplines of image, object-making, and screen-based media in design practice with an emphasis on the study of material culture. Digital technologies are integrated into the creative process to serve as strategies and tools for enhanced communication, application, representation, and dissemination.

The Computation Arts programs are concentrated within the digital and virtual environments where computer technology is embedded in all stages of the creative process and production. The Internet as a system for communication in information and networked societies serves as the intersection that strongly links the disciplines of Design and Computation Arts. Students are encouraged to take courses across Design and Computation Arts.

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### 81.90.1 DESIGN

#### Program Objective

The Major in Design program explores the principal areas of visual communication and the built environment. The program encourages critical thinking and takes an interdisciplinary approach to design theory and practice. Its overarching principle is socio-cultural, environmental, and economic sustainability. Students begin their studies by developing knowledge and technical skill sets across these areas and then specialize according to their interests and abilities. The curriculum engages the student in creative work with the understanding of the impact and consequence of their designs in everyday life. In a collaborative and shared environment, students participate in diverse local outreach and community initiatives.

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#### Program

*Students are responsible for fulfilling their particular degree requirements; hence, the following sequence must be read in conjunction with §81.20.*

*The superscript indicates credit value.*

**66 BFA Major in Design**

3 DART 261<sup>3</sup>

3 DART 262<sup>3</sup> or 263<sup>3</sup>

- 12 DART 221<sup>3</sup>, 280<sup>3</sup>, 291<sup>3</sup>, 292<sup>3</sup>
- 6 DART 391<sup>3</sup>, 392<sup>3</sup>
- 3 DART 349<sup>3</sup> or 380<sup>3</sup>
- 3 Chosen from DART 300-level electives
- 3 DART 491<sup>3</sup>
- 3 DART 492<sup>3</sup> or 493<sup>3</sup>
- 15 Chosen from DART 400-level electives
- 6 Chosen from ARTH; ARTT; or other Fine Arts history- or theory-based courses
- 9 Chosen from any Fine Arts electives (including Computation Arts)

## Design Professional Experience Option

The Design Professional Experience option is available to selected students who are enrolled in the BFA program in Design. The academic content of the Professional Experience option is identical to the regular program with some specific recommendations for courses designed to improve and enhance the student's quality of work performance. Please see §24 for specific details concerning the program.

## Admission to the Major in Design

In addition to the normal admission procedure of Concordia University, there is a distinct admission procedure for applicants to the Major in Design. All applicants must submit a *portfolio* of their own work, as well as a *letter of intent*, as part of the admission process.

For more information concerning these additional requirements and submission deadline dates, please visit the following website: [concordia.ca/finearts/future-students/applying-undergraduate](http://concordia.ca/finearts/future-students/applying-undergraduate).

## 81.90.2 COMPUTATION ARTS

### Program Objective

The Computation Arts programs facilitate a hybrid learning environment for the integration of fine arts and computer science. The core curriculum incorporates conceptual and technical aspects of dynamic imagery, sound, and virtual dimension. Teaching emphasizes non-traditional applications of digital technologies while also developing awareness of the cultural and political implications of new technologies in networked and information societies. Areas of interest in the program include interaction design, physical computing, immersive environments, and experimental sound.

### Programs

*Students are responsible for fulfilling their particular degree requirements; hence, the following sequence must be read in conjunction with §81.20.*

*The superscript indicates credit value.*

#### **60 BFA Specialization in Computation Arts**

- 18 CART 210<sup>3</sup>, 211<sup>3</sup>, 212<sup>3</sup>, 214<sup>3</sup>, 253<sup>3</sup>, 263<sup>3</sup>
- 3 CART 310<sup>3</sup>
- 12 Chosen from 300-level CART courses
- 3 CART 410<sup>3</sup>
- 9 Chosen from 400-level CART courses
- 9 Chosen from CART, DART, or other Fine Arts electives
- 6 Chosen from other Fine Arts non-studio electives

#### **45 BFA Major in Computation Arts (to be combined with Computer Applications Option)**

- 6 FFAR 250<sup>6</sup>
- 12 CART 210<sup>3</sup>, 211<sup>3</sup>, 212<sup>3</sup>, 214<sup>3</sup>
- 3 CART 310<sup>3</sup>
- 6 Chosen from 300-level CART courses
- 3 CART 410<sup>3</sup>
- 9 Chosen from 400-level CART courses
- 6 Chosen from DART or other Fine Arts electives

#### **24 Minor in Computation Arts**

- 12 CART 211<sup>3</sup>, 212<sup>3</sup>, 253<sup>3</sup>, 263<sup>3</sup>
- 6 Chosen from 300-level CART courses
- 6 Chosen from 400-level CART courses

## 24 Minor in Game Design

- 3 CART 215<sup>3</sup>
- 3 Chosen from CART 253<sup>3</sup>; COMP 218<sup>3</sup>, 248<sup>3,5</sup>
- 3 Chosen from CART 315<sup>3</sup>, 353<sup>3</sup>; COMP 376<sup>4</sup>
- 3 Chosen from CART 210<sup>3</sup>; DART 261<sup>3</sup>; ENGL 255<sup>3</sup>; FFAR 257<sup>3</sup>
- 3 Chosen from CART 415<sup>3</sup>, 416<sup>3</sup>
- 3 CART\* or COMP\*\* elective
- 3 CART\* elective
- 3 Fine Arts elective

\*Excluding CART 253 and 315

\*\*Excluding COMP 218, 248 and 376

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## Computation Arts Professional Experience Option

The Computation Arts Professional Experience option is available to selected students who are enrolled in the BFA program, Major or Specialization in Computation Arts. The academic content of the Professional Experience option is identical to that of the regular program with some specific recommendations for courses designed to improve and enhance the student's quality of work performance. Please see §24 for specific details.

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## Admission to the Specialization, Major\*, Minor\*\* in Computation Arts, and Minor\*\* in Game Design

In addition to the normal admission procedure of Concordia University, there is a distinct admission procedure for applicants to the Specialization or Major in Computation Arts. All applicants must submit a *portfolio* of their own work, as well as a *letter of intent*, as part of the admission process.

\*The Major in Computation Arts (45 credits) must be taken in combination with the Option in Computer Applications (45 credits) offered by the Department of Computer Science and Software Engineering. Candidates applying for the Major in Computation Arts are required to complete the 10.12 profile: Mathematics 103 or 201-NYA and 203 or 201-NYB, and 105 or 201-NYC. Candidates lacking Cegep profile 10.12, but with a suitable background, may also be considered for this program. Applicants to the Specialization or Minor in Computation Arts require no background in mathematics.

\*\*The Minor in Computation Arts and the Minor in Game Design are available to a limited number of high-ranking students. Applicants must submit a full portfolio by the March 1 deadline and may contact the Department of Design and Computation Arts for specific application procedures.

For more information concerning these additional requirements and submission deadline dates, please visit [concordia.ca/finearts/design](http://concordia.ca/finearts/design).

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## COURSES

### Computation Arts:

#### **CART 210** *New Media Theory* (3 credits)

Prerequisite: Enrolment in a Computation Arts program or written permission of the Department. This course is a critical introduction to new media theory focusing on issues of interaction, inscription, representation, code, reproduction, spectacle, control, body and resistance. Students develop tools to undertake a critical analysis of media and technology and their social, political, economic, and cultural ramifications.

*NOTE: Students who have received credit for CART 255 may not take this course for credit.*

#### **CART 211** *Creative Computing and Network Culture* (3 credits)

Prerequisite: Enrolment in a Computation Arts program or written permission of the Department. This course gives a broad introduction to the fundamentals of creative computing and network culture. Through readings and practical examples, students explore the histories of the Internet, computing, and interactivity as well as gain knowledge of fundamental technical tools used for creating network-based media.

*NOTE: Students who have received credit for DFAR 251 or CART 251 may not take this course for credit.*

#### **CART 212** *Digital Media Studio I* (3 credits)

Prerequisite: CART 211; enrolment in a Computation Arts program; or written permission of the Department. This studio-based course focuses on the production of dynamic and interactive audio/visual media. Students develop proficiency in generating original audio and visual material as well as exposure to current digital media software. Concurrent with gaining knowledge of existing tools for production, students create a high-quality studio work for portfolio inclusion.

*NOTE: Students who have received credit for DFAR 252 or CART 252 may not take this course for credit.*

#### **CART 214** *Visual Form and Communication* (3 credits)

Prerequisite: Enrolment in a Computation Arts program or written permission of the Department. Key themes of visual communication are explored in the context of computation arts. This studio course considers design elements such as line, pattern, shape, texture, interpretation of space, surface, perspective, dimension, repetition, randomness, colour and colour

spaces, typography, drawing from observation, layout and composition and conceptualization. This class is predominantly non-digital and discusses the relationships between analog and digital approaches.

*NOTE: Students who have received credit for CART 254 may not take this course for credit.*

**CART 215 Introduction to Game Design** (3 credits)

Prerequisite: Enrolment in a Computation Arts program or the Minor in Game Design or written permission of the Department. This course is an introduction to the design of playful activities and games in particular. Students are introduced to terminology, conceptual frameworks, and critical approaches in order to develop a precise understanding of games at a formal and pragmatic level. Students acquire and develop tools to conceive, formalize, and communicate game design ideas.

*NOTE: Students who have received credit for this topic under a CART 398 number may not take this course for credit.*

**CART 253 Creative Computation I** (3 credits)

Prerequisite: Enrolment in the Specialization or Minor in Computation Arts or written permission of the Department. This course focuses on developing students' programming abilities, beginning with basic concepts and building toward approaches of increasing complexity. Students put these concepts and techniques into practice by creating their own expressive digital media projects, exploring areas such as interactivity, play, sound, and video.

**CART 263 Creative Computation II** (3 credits)

Prerequisite: CART 253; or written permission of the Department. In this course, students build on developing proficiency in programming by engaging in larger-scale project work and learning to use more sophisticated data structures, algorithms, and code reuse. Emphasis is placed on developing ambitious and experimental applications that engage deeply with the underlying ideas of computation as a medium.

**CART 310 Interaction Design Studio** (3 credits)

Prerequisite: CART 210; 24 credits completed in a Computation Arts program or written permission of the Department. This course introduces the theories and practices of interaction design. Students learn about interaction design from the early history of computers and computation through to present-day best practice and experimental approaches still being developed. In the studio portion of the course, students apply the theory introduced by developing specific prototype works in multiple forms, including paper, video and digital prototypes.

**CART 312 Digital Media Studio II** (3 credits)

Prerequisite: CART 212; 24 credits completed in a Computation Arts program; or written permission of the Department. This studio-based course furthers work done in CART 212, focusing on the production and authoring of dynamic audio/visual media using advanced techniques such as compositing and motion graphics. Students develop proficiency in generating original audio and visual material as well as exposure to current digital audio-visual-authoring software including postproduction environments such as After Effects and Motion. Concurrent with gaining knowledge of existing tools for production, students create a term-long project which will be a high quality, studio work appropriate for portfolio inclusion.

*NOTE: Students who have received credit for CART 352 may not take this course for credit.*

**CART 315 Digital Game Prototyping** (3 credits)

Prerequisite: CART 263 or COMP 218 or COMP 248; or written permission of the Department. Students study specialized game technology, create a series of digital game prototypes, and are introduced to higher level programming concepts pertaining to interactive applications. Efficient approaches to the design and development of complex interactive software, such as iterative development and rapid prototyping, are explored.

*NOTE: Students who have received credit for this topic under a CART 398 number or for COMP 376 may not take this course for credit.*

**CART 345 Digital Texts and Typography I** (3 credits)

Prerequisite: 24 credits completed in a Computation Arts program; or written permission of the Department. This is a studio course in which students conduct experiments in digital text, type, and typography. It looks at how type can be used in dynamic, interactive, and performative contexts, how manipulating the appearance and behaviour of type affects the meaning of the text, and how to work with the materiality of letterforms. Class projects include motion typography for video, interactive texts, liquid/random/malleable fonts, and computationally responsive letterforms.

*NOTE: Students who have received credit for this topic under a CART 355 number may not take this course for credit.*

*NOTE: Students are expected to have training in the fundamentals of typography.*

**CART 346 Digital Sound I: Theory and Practice of Real-Time Audio** (3 credits)

Prerequisite: 24 credits completed in a Computation Arts, Electroacoustics, or Intermedia (Video, Performance and Electronic Arts) program; or written permission of the Department. This course is an introduction to the fundamental principles of real-time digital audio: the use of a computer to process, synthesize, and manipulate digitized representations of sound in real-time. Topics such as physics of sound, sampling, synthesis techniques, filters, and acoustics are introduced through the use of the real-time programming environments Max/MSP and Supercollider. Students experiment with digital audio techniques through lab exercises and the development of a final real-time composition/sound design work.

*NOTE: Students who have received credit for this topic under a CART 356 number may not take this course for credit.*

**CART 347 Digital Sound II: Sound Design** (3 credits)

Prerequisite: CART 346; 24 credits completed in a Computation Arts, Electroacoustics, or Intermedia (Video, Performance and Electronic Arts) program; or written permission of the Department. This course is a seminar/project studio in the conceptual and technical nature of digitally based sound design for film, video, and interactive multimedia (web, DVDs, games, sensor-augmented environments). Topics include sound and image fusion, audio-vision and conceptual/technical issues related to file and compression formats, spatialization (5.1), communication protocols, editing, mixing, tracking, asset creation and socio-cultural theories of audition. A term-long individual or group-based project is developed that takes participants through all phases of the sound design production workflow.

*NOTE: Students who have received credit for this topic under a CART 356 number may not take this course for credit.*

**CART 351 Networks and Navigation** (3 credits)

Prerequisite: CART 211, 212; CART 263 or COMP 248; 24 credits completed in a Computation Arts program or written permission of the Department. In this course, students develop interactive projects that use networked data, redefine online communities, and experiment with new communication structures. The perceptual and aesthetic aspects of digital media are addressed in relation to the technical skill sets required for navigating and understanding the possibilities and limits of networked environments.

**CART 353 Creative Computation III** (3 credits)

Prerequisite: CART 263 or written permission of the Department. In this course, students develop their programming skills via specific technologies and design perspectives, including but not limited to artificial life, evolutionary computation, procedural content generation, and playful design. The course focuses on students' own studio practice as artist-programmers and supports their continuing exploration of the medium.

**CART 355 Topics in Kinetic Imagery** (3 credits)

Prerequisite: 24 credits in a Computation Arts program. This course provides an opportunity for the study of special topics in kinetic imagery. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

*NOTE: Students who have received credit for DFAR 355 may not take this course for credit.*

**CART 356 Topics in Abstract Soundscapes** (3 credits)

Prerequisite: 24 credits in a Computation Arts program. This course provides an opportunity for the study of special topics in abstract soundscapes. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

*NOTE: Students who have received credit for DFAR 356 may not take this course for credit.*

**CART 357 Topics in Digital Space** (3 credits)

Prerequisite: 24 credits in a Computation Arts program. This course provides an opportunity for the study of special topics in digital and immersive space. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

*NOTE: Students who have received credit for DFAR 357 may not take this course for credit.*

**CART 358 Topics in Senses and Perception** (3 credits)

Prerequisite: 24 credits in a Computation Arts program. Research into sensory perception, touch, and noise is key to project proposals, methodology, and production. Interdisciplinary referencing and collaborative projects are emphasized. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

*NOTE: Students who have received credit for DFAR 358 may not take this course for credit.*

**CART 360 Tangible Media and Physical Computing** (3 credits)

Prerequisite: CART 263\* or COMP 248; 24 credits completed in a Computation Arts program or written permission of the Department. This course explores the concepts of tangible media and physical computation as well as related concepts of ubiquitous computing, wearable computing, and interaction design. The focus is on conceptual development, prototyping, and implementation of tangible media and physical computing artifacts from the perspectives of technical proficiency, functionality, aesthetics, and personal/social meaning.

*\*Students in the Specialization in Computation Arts must complete CART 263.*

**CART 361 3D Digital Production I** (3 credits)

Prerequisite: 24 credits completed in a Computation Arts program; or written permission of the Department. In this studio course, students are introduced to the language, principles, and practices of 3D digital animation. Students are exposed to a wide range of traditional film animation techniques and learn the technical skills and conceptual strategies for 3D digital production.

*NOTE: Students who have received credit for CART 261 may not take this course for credit.*

**CART 362 3D Digital Production II** (3 credits)

Prerequisite: CART 361; 24 credits completed in a Computation Arts program; or written permission of the Department. This intermediate studio furthers conceptual and technical skills related to 3D digital animation. Through film analysis, readings, and lectures, students study film animation aesthetics, contemporary film practice, and advanced 3D animation techniques.

*NOTE: Students who have received credit for CART 262 may not take this course for credit.*

**CART 370 Real-Time Video** (3 credits)

Prerequisite: 24 credits completed in a Computation Arts program; or written permission of the Department. A studio course in the creation and real-time processing of moving textures and video. This course surveys computer-based video art, particularly applied to installation or performance arts. It provides an introduction to mathematical approaches to real-time processing of 2D and higher-dimensional arrays, image and video filters, motion segmentation, and tracking blobs, optical flow, faces, and shapes.  
*NOTE: Students who have received credit for this topic under a CART 498 number may not take this course for credit.*  
*NOTE: Students should have experience or knowledge in videography and video editing.*

**CART 398 Special Topics in Computation Arts** (3 credits)

Prerequisite: Enrolment in a Computation Arts program or written permission of the Department. This course provides an opportunity for the study of specialized aspects and applications in computation arts. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

**CART 410 Research-Creation in the Computation Arts** (3 credits)

Prerequisite: CART 210, 310; or written permission of the Department. This course consolidates and contextualizes students' existing understanding of their own practice by framing it in terms of research-creation. Related theoretical and methodological frameworks are introduced and discussed in order to give students the language and conceptual insight to think, write and speak convincingly about their own and others' work.

**CART 411 Project Studio I** (3 credits)

Prerequisite: 48 credits completed in a Computation Arts program or written permission of the Department. In this course, students integrate skills with objects, narratives, and environments. They refine both critical and practical management skills in team-based projects.

**CART 412 Project Studio II** (3 credits)

Prerequisite: CART 411; 48 credits completed in a Computation Arts program; or written permission of the Department. An advanced studio and theory course in which students integrate skills with objects, narratives, and environments. They refine both critical and practical management skills in team-based projects.  
*NOTE: Students who have received credit for CART 452 may not take this course for credit.*

**CART 414 Matter and Media** (3 credits)

Prerequisite: CART 255; 48 credits completed in a Computation Arts program; or written permission of the Department. This seminar prepares students for professional creation/research via analog or computational media and material arts, informed by philosophy of technology, art, and design. Topics may include continuity, transformation, distributed agency, responsivity, and tangibility.  
*NOTE: Students who have received credit for this topic under a CART 454 number may not take this course for credit.*

**CART 415 Game Studio I** (3 credits)

Prerequisite: CART 315 or 353 or COMP 376; or written permission of the Department. This course introduces students to experimental game design, especially through the creation of their own unconventional and expressive digital games. A theoretical and critical understanding of play and games is established through lectures, discussion, game playing, game making and critiques. Students make multiple prototype games in order to better understand relationships between design, technology and the resulting player experience.

**CART 416 Game Studio II** (3 credits)

Prerequisite: CART 315 or 353 or COMP 376; or written permission of the Department. In this studio course, students engage in larger-scale, team-based, iterative game development projects. Specific attention is given to the design of games that have intended purposes alongside entertainment — whether these be expressive, critical, persuasive, or educational in nature. Working in teams, students move from developing a concept around a rhetorical/experiential intention, to designing and developing a digital game prototype, and finally to examining play outcomes. Practical work is in dialogue with theory drawn from game design, game studies and interaction design.

**CART 433 (also listed as DART 455)  
Information Design** (3 credits)

Prerequisite: 48 credits in Computation Arts or written permission of the Department. This course focuses on rhetoric, visualization of information, instructions and complex text-based content. Issues of communication, simplification and clarification of content, and information architecture are addressed through diagrams, maps and visualization of statistics.  
*NOTE: Students who have received credit for DART 455 or for this topic under a DART or CART 498 number may not take this course for credit.*

**CART 434 Advanced 3D Studio** (3 credits)

Prerequisite: CART 362; 48 credits completed in a Computation Arts program; or written permission of the Department. This advanced studio builds upon 3D modelling for animation, gaming, and spatial environments. Concurrent with the development of technical skill sets, students develop thematic projects with consideration given to industry standards and cultural products for public or private enterprise.  
*NOTE: Students who have received credit for CART 354 may not take this course for credit.*

**CART 444 Portfolio Studio (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; or written permission of the Department. This studio course leads graduating Computation Arts students through an analysis and synthesis of a personal body of work, self-promotional material, and a framework for a group exhibition. Discussions and assignments address the technical, formal, and conceptual elements in their work, and strategies for documentation and presentation. Students are also expected to locate their work in a social, cultural, and historical context. Various future options for Computation Arts graduates are discussed, including careers in art, entrepreneurship, design, research, and academia.

*NOTE: Students who have received credit for this topic under a CART 498 number may not take this course for credit.*

**CART 451 Networked Media Studio (3 credits)**

Prerequisite: CART 351; 48 credits completed in a Computation Arts program or written permission of the Department. This course introduces advanced topics in networked media, exploring the potential of connected technologies in multiple contexts, from their role in present-day life to potential future scenarios. Special attention is given to the design rhetorics and values commonly embedded in the web and internet-enabled devices and how students can work to subvert or repurpose these conventional approaches to design.

**CART 453 The Digital Nomad (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; or written permission of the Department. This studio course is based on mobility or nomadic considerations in new media productions. Transportable and flexible equipment configurations are developed to support on-site performance events, projection, and multimedia installations.

*NOTE: Students who have received credit for DFAR 453 may not take this course for credit.*

**CART 455 Professional Internship I (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; written permission of the Department. Students work in the industry for a period of nine to thirteen weeks to allow them to gain experience in design firms and multimedia companies. Internships approved for credit must be academically appropriate to the program.

*NOTE: Students may count a maximum of six credits in professional internships towards their degree program.*

**CART 456 Professional Internship II (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; written permission of the Department. Students work in the industry for a period of nine to thirteen weeks to allow them to gain experience in design firms and multimedia companies. Internships approved for credit must be academically appropriate to the program.

*NOTE: Students may count a maximum of six credits in professional internships towards their degree program.*

**CART 457 Independent Study I (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; written permission of the Department. This course provides an opportunity for a limited number of students to pursue advanced studies in computation arts research and creation project under the supervision of a full-time faculty member. A clearly defined written agreement between the student and the faculty supervisor is required before the independent study is approved.

*NOTE: Students may count a maximum of nine credits in independent studies towards their degree program.*

**CART 458 Independent Study II (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; written permission of the Department. This course provides an opportunity for a limited number of students to pursue advanced studies in computation arts research and creation project under the supervision of a full-time faculty member. A clearly defined written agreement between the student and the faculty supervisor is required before the independent study is approved.

*NOTE: Students may count a maximum of nine credits in independent studies towards their degree program.*

**CART 459 Independent Study III (3 credits)**

Prerequisite: 48 credits completed in a Computation Arts program; written permission of the Department. This course provides an opportunity for a limited number of students to pursue advanced studies in computation arts research and creation project under the supervision of a full-time faculty member. A clearly defined written agreement between the student and the faculty supervisor is required before the independent study is approved.

*NOTE: Students may count a maximum of nine credits in independent studies towards their degree program.*

**CART 460 Bending Bits: Advanced Topics in Digital Media (3 credits)**

Prerequisite: CART 411 previously or concurrently; 48 credits completed in a Computation Arts program; or written permission of the Department. An advanced studio course examining the ways computation can be deeply integrated into students' creative practices. Projects look at how computation can be used to transform interactivity into a semantic strategy, input/output into a dialogue between the user, the work, and the world, and data processing into means of aesthetic exploration.

*NOTE: Students are expected to have solid skills in general-purpose programming before starting the class.*

**CART 461 Tangible Media Studio (3 credits)**

Prerequisite: CART 360; 48 credits completed in a Computation Arts program or written permission of the Department. This studio course introduces advanced topics in tangible media and the related aesthetic and interaction design challenges and opportunities. Students work together on experimental projects that push the boundaries of physical interfaces and the expressivity of installation-based digital work.

**CART 498 Special Topics in Computation Arts (3 credits)**

Prerequisite: Enrolment in a Computation Arts program or written permission of the Department. An advanced course which provides an opportunity for the study of specialized aspects and applications in digital fine arts. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

**Design:**

**DART 221 Visual Communication in Context (3 credits)**

Prerequisite: Enrolment in the Major in Design or written permission of the Department. This studio course engages students in the study and application of graphic composition and visual communication. It focuses in particular on the elements and principles of layout and colour theory.

*NOTE: Students who have received credit for DART 200 may not take this course for credit.*

**DART 261 Introduction to Design Studies (3 credits)**

Prerequisite: Enrolment in the Major in Design or written permission of the Department. This lecture course examines key themes in the history and theory of visual communication and the built environment from industrialization to the present day. Emphasis is given to current as well as future implications of design practice. Research methods in the discipline are introduced to facilitate development of students' analytical and critical abilities, both oral and written.

*NOTE: Students are required to take this course in the first year of the Design program.*

*NOTE: Students who have received credit for DART 260 may not take this course for credit.*

**DART 262 Exploring Design Studies (3 credits)**

Prerequisite: DART 261; enrolment in the Major in Design; or written permission of the Department. This theory course introduces students to innovative and creative ways of thinking about design, and offers means of organizing their ideas effectively and convincingly. Referring to both historic and current examples of design theory and practice, coursework and assignments explore existing frameworks or models for design studies, enabling students to investigate critical aspects of visual communication and the built environment.

*NOTE: Students who have received credit for DART 260 may not take this course for credit.*

**DART 263 Design History and Sustainability (3 credits)**

Prerequisite: DART 221, 261; DART 291, 292 previously or concurrently; or written permission of the Department. This theory course offers students a reflective space to explore sustainable design theory and practice through historical artifacts, and thereby expand their intellectual engagement with key issues in past, present, and potential future approaches to design complexity and design for sustainability.

*NOTE: Students who have received credit for this topic under a DART 298 number may not take this course for credit.*

**DART 280 Investigations in Typographic Design (3 credits)**

Prerequisite: DART 221; DART 291, 292 previously or concurrently; or written permission of the Department. This studio course focuses on typographic design and explores the functional and expressive aspects of typography. Process-based assignments emphasize the principles of typography, information hierarchy, multiple-page content, and text-image relationships.

*NOTE: Students who have received credit for DART 200 may not take this course for credit.*

**DART 291 Design Process and the Materiality of Objects (3 credits)**

Prerequisite: DART 221, 261; or written permission of the Department. This studio course concentrates on the design process and provides students with communication strategies including sketching in perspective and technical drawing. Assigned projects address creativity, sustainable materials, and construction techniques.

*NOTE: Students who have received credit for DART 210 or 290 may not take this course for credit.*

**DART 292 Bio-Inspiration in the Design of Objects (3 credits)**

Prerequisite: DART 221, 261, 262 or 263, 291; DART 280 previously or concurrently; or written permission of the Department. This studio course advances the study of materials and construction methods. Assignments emphasize research and research methods specifically within the study of bionics. Students explore nature as inspiration to facilitate innovative and effective life cycles of designed objects.

*NOTE: Students who have received credit for DART 210 or 290 may not take this course for credit.*

**DART 298 Special Topics in Design Art (3 credits)**

Prerequisite: Enrolment in the Major in Design or written permission of the Department. This course provides an opportunity for the study of special issues in Design. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

**DART 331 Words in Space (3 credits)**

Prerequisite: DART 280; DART 391, 392 previously or concurrently; or written permission of the Department. This studio course focuses on type and image in the built environment. Issues of space, materiality, and legibility are examined within architectural and urban landscapes. Students engage in projects ranging from wayfinding and signage to exhibition design and installations.

*NOTE: Students who have received credit for DART 300 may not take this course for credit.*



**DART 332** *Print Concepts and Processes* (3 credits)

Prerequisite: DART 221, 261, 262 or 263, 280; 24 credits in the Design Major; or written permission of the Department. This studio course focuses on the conceptualization, process, and production of printed projects. Assignments relate content and narrative to the material nature of printed matter, printing techniques, and the responsible use of resources.

**DART 335** *Interpretive Public Spaces* (3 credits)

Prerequisite: DART 380 or 381; DART 391, 392 previously or concurrently; or written permission of the Department. This studio course develops strategies for interactions in the public sphere. The application of scenography, planning of space and the integration of content orients the student towards the design of museum installations, mobile exhibitions, and performative events.

**DART 339** *Second Skin and Soft Wear* (3 credits)

Prerequisite: DART 380 or 381; DART 391, 392 previously or concurrently; or written permission of the Department. This studio course contextualizes the making of and the concepts relating to soft surfaces, objects, furniture, and sculptural forms. Students are also encouraged to explore the sensory interfaces between surface and structure in design by investigating alternative material use and new technologies for innovative textile design, electronics, and body wear.

**DART 349** *Introduction to Web Design* (3 credits)

Prerequisite: 24 credits in the Major in Design or written permission of the Department. This studio course introduces students to such aspects of web design as graphic user interface; navigation and information hierarchies; the differences between screen and print; and user experience; and explores the challenges facing designers working in an online environment. Students create websites for multiple platforms and mobile devices, as well as experiment with innovative ways of organizing information.

*NOTE: Students who have received credit for this topic under a DART 398 number may not take this course for credit.*

**DART 380** *3D Digital Concepts* (3 credits)

Prerequisite: DART 280; 24 credits in the Major in Design; or written permission of the Department. This computer lab course introduces students to computer-assisted 3D design concepts. Practical exercises advance technical skills and are combined with thematic proposals for virtual object representation. Scaled object production is encouraged in the final stages of the studio.

*NOTE: Students who have received credit for DART 300 may not take this course for credit.*

**DART 381** *Digital Media and Moving Images* (3 credits)

Prerequisite: DART 280; 24 credits in the Major in Design; or written permission of the Department. In this studio course, students generate concepts, thematic proposals, storyboards, and narratives for audiovisual presentations and creative works with a focus on online or web applications. Students develop projects for motion graphics, kinetic typography, as well as audio components.

*NOTE: Students who have received credit for DART 300 may not take this course for credit.*

**DART 391** *Socio-Cultural Research and Practice* (3 credits)

Prerequisite: DART 221, 261, 262 or 263, 280, 291, 292; 24 credits in the Major in Design; or written permission of the Department. This studio course emphasizes the significance of research and context in the development of socio-cultural sustainability and collaborative design practice. Students experiment with word-image relationships exploring diverse mediums including small-scale publishing, soft surface design, dimensional packaging, and body wear.

*NOTE: Students who have received credit for DART 310 or 390 may not take this course for credit.*

**DART 392** *Environmental Research and Practice* (3 credits)

Prerequisite: DART 261, 262 or 263, 291, 292, 391; 24 credits in the Major in Design; or written permission of the Department. This studio course develops students' expertise in design research and support applications for the built environment, through specific sustainable projects and community initiatives. Students work in collaboration with different stakeholders in the research, conceptualization, construction, and analysis stages of project design.

*NOTE: Students who have received credit for DART 310 or 390 may not take this course for credit.*

**DART 398** *Special Topics in Design* (3 credits)

Prerequisite: 24 credits in the Major in Design or written permission of the Department. This course provides an opportunity for the study of special issues in design art. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

**DART 440** *Un.bound in Perfect Print* (3 credits)

Prerequisite: 48 credits in the Major in Design or written permission of the Department. This studio course focuses on producing a series of self-directed conceptual or thematic book works. Projects are informed by studies of the history, craft and cultural significance of limited edition publications, unbound/bound bookworks, *livres-objets* and zines.

*NOTE: Students who have received credit for this topic under a DART 498 number may not take this course for credit.*

**DART 441** *The Culture of Images* (3 credits)

Prerequisite: DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. In this theory course students analyze the impact of images through the study of popular culture and the persuasiveness of advertising in image-saturated and information-dense societies. Projects address strategies for effective visual communication as catalysts towards transformative socio-cultural environments.

*NOTE: Students who have received credit for DART 422 may not take this course for credit.*

**DART 442     *Scenarios for Typography* (3 credits)**

Prerequisite: DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. This studio course engages students to explore the diversity of typographic expression within a visual and literary context.

Assignments are designed to address the significance and complexity of words for persuasive messaging, multilingual information exchange, and typographic play in visual communication.

*NOTE: Students who have received credit for DART 422 may not take this course for credit.*

**DART 443     *Print: Meaning and Process* (3 credits)**

Prerequisite: DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. This computer lab course focuses on graphic design in publishing systems. The implications of mass production, the responsible use of resources, and alternative print and packaging processes are key factors in the ecology of image production.

*NOTE: Students who have received credit for DART 424 may not take this course for credit.*

**DART 444     *Portfolio Design* (3 credits)**

Prerequisite: DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. In this studio course, students represent their design practice in a series of portfolio materials. Visual and written documentation are developed for print, digital media, and exhibition.

*NOTE: Students who have received credit for DART 424 may not take this course for credit.*

**DART 445     *The Narrative Object* (3 credits)**

Prerequisite: DART 380 or 381; DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. In this studio course, the mythic potential of objects as personal and cultural markers is considered in the context of everyday life. Students construct meaning through objects, responding to the potential for expression inherent in materials, structure, and form. The rigour of observation, analysis, and interpretation of object stimulates opportunities for multiple readings.

*NOTE: Students who have received credit for DART 423 may not take this course for credit.*

**DART 446     *Studies in the Built Environment* (3 credits)**

Prerequisite: DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. In this theory course, students explore physical space as a complex dynamic in which nature, architecture, things, and people continuously interact and influence each other. Students develop skills to explore such concepts as spatiality and materiality, to enhance their understanding of, and contributions to, the built environment.

*NOTE: Students who have received credit for DART 423 may not take this course for credit.*

**DART 447     *The Future Life of Objects* (3 credits)**

Prerequisite: DART 380; DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. This studio course encourages students to analyze the integration and impact of digital technologies in the production of three-dimensional objects and space design. Students examine current technologies and production and explore concepts for objects, enhancing the long-term value and use of objects within the built environment.

*NOTE: Students who have received credit for DART 425 may not take this course for credit.*

**DART 448     *Nature-Inspired Environments* (3 credits)**

Prerequisite: DART 380; DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. In this studio course, students examine natural systems to uncover design potential for the built environment. Students develop innovative approaches that advance sustainable design thinking through the study of intrinsic environmental geometries, behaviours, narratives, and life-cycle flows.

*NOTE: Students who have received credit for DART 425 may not take this course for credit.*

**DART 449     *The Language of the Web* (3 credits)**

Prerequisite: DART 349; 48 credits in the Major in Design or written permission of the Department. In this studio course, students develop online applications and innovative methods for organizing and disseminating information. Issues of interactivity, navigation, and open-source media are emphasized.

*NOTE: Students who have received credit for DART 410 or 411 may not take this course for credit.*

**DART 450     *Web Intervention* (3 credits)**

Prerequisite: DART 349; 48 credits in the Major in Design or written permission of the Department. In this studio course, students create socially engaged online interventions. Projects are informed by open-source culture, social media, and the effects of technological democratization.

*NOTE: Students who have received credit for DART 410 or 411 may not take this course for credit.*

**DART 451     *Digital Interaction* (3 credits)**

Prerequisite: DART 381; DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. This lab course considers the rhetoric of interactivity. The ubiquity of the graphic user interface is problematized through the use of non-linear narrative and metaphor. Students develop and select new paradigms for human-computer interaction.

*NOTE: Students who have received credit for DART 410 or 411 may not take this course for credit.*

**DART 452     *Immersive Media* (3 credits)**

Prerequisite: DART 381; DART 491, 492 previously or concurrently; 48 credits in the Major in Design; or written permission of the Department. Students in this interdisciplinary lab course consider the expanded use of technologies for digital media in the context of 3D objects and environments. Through collaborative projects, students explore immersive installations integrating sound, video, interactivity, and performative events.

*NOTE: Students who have received credit for DART 410 or 411 may not take this course for credit.*

**DART 453     *Design and Community Engagement* (6 credits)**

Prerequisite: 24 credits in the Major in Design; or 24 credits in a Major in Fine Arts; or enrolment in the Loyola College for Diversity and Sustainability's Minor in Diversity and the Contemporary World; or written permission of the Department. A special project-based studio that provides students the opportunities to dialogue with and engage with Montreal-based outreach programs, community centres and not-for-profit organizations. Concordia students apply their communication and technical skill sets to collaborate with community partners and participants on specific design projects.

*NOTE: Students who have received credit for DART 481 or for this topic under a DART 498 number may not take this course for credit.*

**DART 455     (also listed as *CART 433*)  
*Information Design* (3 credits)**

Prerequisite: 48 credits in the Major in Design or written permission of the Department. This studio course focuses on rhetoric, visualization of information, instructions and complex text-based content. Issues of communication, simplification and clarification of content, and information architecture are addressed through diagrams, maps, and visualization of statistics.

*NOTE: Students who have received credit for CART 433 or for this topic under a CART 498 or DART 498 number may not take this course for credit.*

**DART 456     *Inter.Net.Works* (3 credits)**

Prerequisite: DART 349; 48 credits in the Major in Design or written permission of the Department. In this studio course, students study how audiovisual information is received, perceived and utilized, with a focus on online identity through networked strategies. Modular and flexible frameworks are implemented so that communications/portfolios are sustainable, diverse and dynamic documents, which can be expanded, revised and abbreviated for a multi-sensory experience via computers, mobile devices or as printable documents.

*NOTE: Students who have received credit for DART 444 or for this topic under a DART 498 number may not take this course for credit.*

**DART 461     *Independent Study I* (3 credits)**

Prerequisite: 48 credits in the Major in Design and written permission of the Department. This course provides an opportunity for a limited number of students to pursue advanced studies in a design research and creation project under the supervision of a full-time faculty member. A clearly defined written agreement between the student and the faculty supervisor is required before the independent study is approved.

*NOTE: Students may count a maximum of nine credits in independent studies towards their degree program.*

**DART 462     *Independent Study II* (3 credits)**

Prerequisite: 48 credits in the Major in Design and written permission of the Department. This course provides an opportunity for a limited number of students to pursue advanced studies in a design research and creation project under the supervision of a full-time faculty member. A clearly defined written agreement between the student and the faculty supervisor is required before the independent study is approved.

*NOTE: Students may count a maximum of nine credits in independent studies towards their degree program.*

**DART 463     *Independent Study III* (3 credits)**

Prerequisite: 48 credits in the Major in Design and written permission of the Department. This course provides an opportunity for a limited number of students to pursue advanced studies in a design research and creation project under the supervision of a full-time faculty member. A clearly defined written agreement between the student and the faculty supervisor is required before the independent study is approved.

*NOTE: Students may count a maximum of nine credits in independent studies towards their degree program.*

**DART 471     *Professional Internship I* (3 credits)**

Prerequisite: 48 credits in the Major in Design and written permission of the Department. This course provides an opportunity for a limited number of students to further develop their design skill sets as an intern in a design firm or cultural organization such as a museum or graphic and industrial design association. A clearly defined written agreement between the student intern, the employer, and the full-time faculty supervisor is required before the internship is approved.

*NOTE: Students may count a maximum of six credits in professional internships towards their degree program.*

**DART 472     *Professional Internship II* (3 credits)**

Prerequisite: 48 credits in the Major in Design and written permission of the Department. This course provides an opportunity for a limited number of students to further develop their design skill sets as an intern in a design firm or cultural organization such as a museum or graphic and industrial design association. A clearly defined written agreement between the student intern, the employer, and the full-time faculty supervisor is required before the internship is approved.

*NOTE: Students may count a maximum of six credits in professional internships towards their degree program.*

**DART 491     *Discursive Design Research I*** (3 credits)

Prerequisite: Final-year\* standing in the Major in Design; or written permission of the Department. This core theoretical course combines lectures and discussions, emphasizing the contextual and societal implications of the design process from conception to production. Multidisciplinary approaches to design research and methodology allow students to advance the discourse of their own emerging design ethic and aesthetic.

*\*Fewer than 33 credits remaining in degree program.*

*NOTE: Students who have received credit for DART 400 or 490 may not take this course for credit.*

**DART 492     *Discursive Design Research II*** (3 credits)

Prerequisite: DART 391, 392, 491; 48 credits in the Major in Design; or written permission of the Department. This core course explores the interstices between visual culture, material culture, and related theoretical discourses as disciplines which profoundly influence the design process. Particular attention is devoted to multidisciplinary engagement as applied to individual design scenarios. This course is a continuation of DART 491.

*NOTE: Students who have received credit for DART 400 or 490 may not take this course for credit.*

**DART 493     *Post-Graduation Strategies in Design*** (3 credits)

Prerequisite: DART 491 previously or concurrently; 48 credits in the Major in Design or written permission of the Department. In this seminar course, students have the opportunity to explore subject matter related to both professional practice and graduate studies. Topics related to the former include eco-focused business or sustainable business models, eco-conscious design practice, time-planning strategies, intellectual property (copyrights, patents), funding models and business start-ups. Topics related to potential graduate studies include grant writing, selection of graduate programs, and research project proposals.

**DART 498     *Special Topics in Design*** (3 credits)

Prerequisite: 48 credits in the Major in Design or written permission of the Department. A course for advanced students which provides an opportunity for the study of special issues in design art. Specific topics for this course, and prerequisites relevant in each case, are stated in the Undergraduate Class Schedule.

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