CARLETON UNIVERSITY
School of Industrial Design

Brief for the Appraisal
of the
Master of Design (MDes)

Submitted to the
Ontario Council of Graduate Studies
January 2007
Revised January 2008

VOLUME I: THE PROGRAM

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A. INTRODUCTION

A.1. Proposed Program: *Master of Design (MDes)*

Carleton University's School of Industrial Design proposes to establish a graduate Master of Design (MDes) Program, advancing the knowledge of design by building on the School's experience and strengths in the field of design education. The program of study will examine and incorporate multifaceted design principles and practices that contribute to the strategic value of design. The primary objectives of the program, which are described in length in section A.5.1., are to promote design research, strategic design planning, knowledge creation and dissemination, and interdisciplinary design development.

MDes Graduates will be prepared to integrate design principles, methodologies, and interdisciplinary design development processes into senior levels of private and public sector design business practice. They will be well prepared to play a strategic role in championing design where, in the words of Roger Martin, Dean of the University of Toronto's Rotman School of Management, "leveraging the power of design across all aspects of a business can establish and sustain the organization's unique competitive advantage".

Martin's comment captures the increased importance that the business sector has placed on design as a strategic resource for innovation and economic competitiveness, as discussed further in section A.2.1. Designers are now well-recognized world wide for their ability to synthesize functional, aesthetic, social, ethical and cultural considerations in the development of new products, systems and services. This new level of recognition for the value of successful design has increased the pressure on the academy to provide higher levels of design education. In September, the Industrial Designers Society of America (IDSA) 2006 National Conference and Education Symposium focused on the need for change. The theme of change was not only reflected in the conference title, "Elements of Change" but also in the papers, presentations, and panel discussions.

The design educators present acknowledged that the Bachelor's degree, which was up until recently considered the capstone degree for a professional industrial designer, has now effectively been replaced by the Master's Degree, and in increasing numbers, by the PhD as the terminal degree in the field. Carleton University Graduates with a Bachelor of Industrial Design have a comprehensive skill set that enables them to effectively design a wide range of products for mass production (see section A.4.) and to effectively compete for entry level design positions globally. These same graduates have historically been able to then leverage their design careers into higher level design management positions. There are now clear indicators that the entry requirements for these design management positions are dramatically shifting.

Asian competitors have mastered many of the same skills. This now challenges North American designers to more clearly define their strategic contributions to the design field. The unique strengths North American designers bring to the field include expertise in: user-oriented design research methods, strategic product positioning, analysis of design requirements, design management, interdisciplinary design processes, along with an understanding of social and cultural diversity. Many of these issues are minimally addressed in the undergraduate curriculum, however these topics are now recognized as core curriculum of a graduate design program as identified in section B.2. of this proposal.

At the IDSA conference further discussions identified the need to update design curricula on an ongoing basis due to the rapidly changing technologies used for design processes such as rapid prototyping and advanced visualization. There was also an emphasis on the importance of developing a graduate culture of adaptability dedicated to research and knowledge dissemination as well as the need for design educators with higher degrees. In addition, other important issues that directly influence the quality of the design included: environmental sustainability, the social

and cultural impact of design solutions, and the simplicity of the interaction between people and the products, services and environments that have been designed to meet their needs. These are addressed in more detail in section B.2.

The demand for graduate design programs has been clearly articulated in a series of international, national, and provincial studies on the profession of design, which are outlined in section A.2. The introduction of the MDes program at Carleton will address the current imperative need in Ontario and Canada for such strategic design thinking to influence successful Canadian design businesses at the governmental, corporate and small business levels. The MDes program has been structured to meet this demand, and focuses on greater utilization of design resources in the area of innovation and economic competitiveness, and in improving the social and environmental quality of people's lives.

The MDes program will complement the B.I.D. undergraduate program. There is no other graduate program in the province that provides the education relevant to the issues described above as discussed in sections A.2.2 and A.3.1. At Carleton, the foundation for a graduate design program with interdisciplinary participation has already been established. The School has strong ties with the HOT (Human Oriented Technology) Lab in the department of Psychology. Moreover, well recognized affiliations in the undergraduate program where B.I.D. students are required to take courses in business, psychology, economics, math, and physics add to the project-dependent links that exist with architecture, computer systems engineering, and mechanical and aerospace engineering, among others. (See sections A.4. and A.6.1.)

The program will build on and advance the School's reputation in commercial design circles, as well as recognized interdisciplinary links with other provincial, national, and international institutions. In this regard, ongoing projects with Clemson University in South Carolina (now in the third year) and the School of Interactive Arts and Technology at Simon Fraser University complement industry sponsored projects with corporations such as Symbol Technologies (New York State), FilterStream (Massachusetts), Bombardier (Quebec), Smart Technologies (Calgary), and others. (See section B.2 for other examples.)

The program will also support, and be supported by, the strategic goals of Carleton University, with particular respect to developing innovative research programs that focus on anticipating and meeting the needs of a changing world, supporting international learning opportunities and integrating interdisciplinary initiatives. (See section A.5.4.)

A.2. Demand for the Proposed Program

A.2.1. <u>Demands for the Profession</u>

As previously stated, awareness of the profession of industrial design, and design in general, has rapidly increased in the last decade. Although the knowledge and activities of industrial design have been well established within the profession, a larger awareness outside the profession is relatively recent. It wasn't until 1957 that the International Council of Societies of Industrial Design (ICSID) was established and 1971 that ICSID published a working definition of the activities of the profession.

Since then the need for more of the important contributions that design is making to economic, social, and environmental imperatives has been abundantly recognized and articulated at all levels of government, and within business circles. Highlights of these initiatives follow.

United Sates

In 1993, The National Endowment for the Arts' Design Program held a conference to formulate options for a U.S. Design Council and Office of Federal Design Quality. The conference was based on the premise that *"Design – of products, services, communications and environments – is a strategic national resource whose potential has yet to be realized"*. The conference was attended by delegations from the British Design Council (est. 1944), the Danish Design Center (est. 1987), the Barcelona Design Center (est. 1973), the Taiwan Design Promotion Center (est. 1979), and the International Design Center Nagoya Japan (est. 1992). This resulted in the creation of the White House Council on Design whose mission was to *"utilize U.S. design resources to achieve strategic national goals in the areas of economic competitiveness, environmental quality, education, and social inclusiveness"*.

Canada

In 1996, Human Resources Development Canada (HRDC) sponsored the first comprehensive study of the design sector in Canada at the national level: Shaping Canada's Future BY DESIGN. In the preface of the executive summary it was stated that *"This report is all about building bridges: among the disciplines; internationally, with other professions implicated in the design process; with educational institutions; with design mangers in industry; with the ultimate end-users of design; with government and with the general public"*.

Among the report's recommendations for design education were the following: to *"enhance business management skills in designers; promote a multidisciplinary approach to the design-development process; facilitate the transition of design students to the workforce; and encourage continuous learning and research"*.

Progress has been made since the 1996 recommendations, and the Canadian Design Research Network (CDRN) was formed in 2004. In 2005, the CDRN received a federal Networks of Centres of Excellence New Initiatives award. The goals of the CDRN are to:

- Collaborate through joint research work;
- Share ideas, expertise, and resources;
- Develop a nationwide research infrastructure;
- Increase the number of highly qualified personnel in design;
- Improve retention of expertise in Canada; and
- Facilitate involvement in international design initiatives.

Ontario

In 2004, the Design Industry Advisory Committee (DIAC) of the City of Toronto's Economic Development Corporation (TEDCO) published its final report on design in Ontario entitled DESIGN MATTERS: DIAC Design Industry Study. The need for new graduate programs in design was emphasized.

"Fully 44% of Canada's designers live in Ontario. … When it comes to the Design Index (our measure of the degree of specialization in design occupations), Toronto ranks fourth in North America, behind San Francisco, Boston, and New York. This is an extraordinary set of statistics whose significance has not been evident until now".

"But designers and their employers do not believe that current continuing education programs adequately address emerging skills gaps for the design workforce."

A.2.2. <u>Demand for New Graduate Programs</u>

The significance of DIAC's findings regarding the number of designers in Ontario and the need for new graduate programs is being taken seriously, and universities and colleges are responding. The DIAC report states that there are only three Master's programs in Ontario, only one within a university environment, and no Doctoral programs.

Although there are successful international programs (see section A.3.) that do incorporate similar elements in their curriculum, there are currently no other graduate design programs in Ontario or elsewhere in Canada that offer a program of study similar to the one being proposed. In particular, the school's strengths in advanced materials and manufacturing, advanced visualization, extreme environments, and product interaction design provide a high degree of differentiation from the other existing design programs. At the same time these strengths will complement and augment the focus on design and culture, design management, human-centered design, interdisciplinary design methods, strategic design, and sustainable design which already exist at other Canadian institutions. The proposed program has also been structured to address the most current needs of the profession.

A.2.3. <u>Demand of Students</u>

It is anticipated, considering the program offerings, that the majority of applicants will come from the field of industrial design. Secondarily, applicants may have a background in other design fields such as interior design, architecture, interaction design, new media design, and visual communication and other design-related fields. Candidates from other design related fields, engineering, computer science, psychology, sociology and anthropology, may be admitted provided they can demonstrate substantial knowledge of, and experience in, design. The school currently receives an average of eight to ten requests yearly for graduate studies. Approximately one third come from past B.I.D. graduates and the rest from international students. Some of these requests come from students with design-related job experience and undergraduate or graduate degrees in other fields. Therefore the program would admit some applicants without an undergraduate design background as explained in section D.2.4. and D.2.6. of this proposal. This would fit in with the proposed program objective of promoting the interdisciplinary nature of the design development process.

Since the role of design in society has changed significantly in recent years (refer to Section A.1.) a program that focuses on the advanced expertise integral to strategic design planning is well-timed. There is an international demand for graduates with expertise at a senior level in the area of design. A visit to the Coroflot design job postings web site in August 2006 provided five hundred and sixteen design jobs, of which ninety-seven were at the Senior level with titles such as Design Research and Planning, Innovation Lead, and Senior Design Researcher. Two hundred and twenty-five of the jobs posted were for industrial design positions, many at familiar companies such as Matsushita, Reebok Inc., Coca-Cola, Motorola, Frog Design, Smart Design, Samsung, Rubbermaid Home Products, Kawasaki Motors, Kimberly-Clark, Dell Inc., Nike Inc., and Whirlpool Corporation.

In addition to the demand from professionals already employed in the design workforce, there is a demand from recent graduates of undergraduate programs. In 2003, two Ontario colleges (Humber College and the Ontario College of Art and Design) introduced undergraduate degree programs in industrial design and will be graduating students interested in further study opportunities. This has created a smaller pool of potential candidates for the MDes degree: the faculty at these colleges who currently have Bachelor's degrees.

A large pool of applicants to this program would be found in graduates from the School's own undergraduate program, as indicated from past experience. A significant number have gone on to Master's studies in three main areas: business, related design professions (e.g., graphic/visual

communication, interaction design, architecture, and engineering), and human oriented studies (e.g., kinesiology, and human factors).

In Canada, they have pursued Master's studies in other fields at: Carleton University's Sprott School of Business, School of Canadian Studies, Departments of Engineering, and Department of Psychology; University of Calgary; University of Ottawa; University of Toronto; University of Montreal; and University of Waterloo.

Internationally they have studied at: Pratt Institute School of Design, New York; University of Illinois at Urbana-Champaigne; Massachusetts Institute of Technology, Berkeley School of Architecture; Southern California Institute of Architecture; Royal College of Art, England; Loughborough University, England; Interaction Design Institute, Ivrea, Italy; Domus Academy, Milan, Italy; and the University of Tokyo, Japan.

Through this new program the School will better satisfy the demand of, and offer greater opportunities to, graduates of Carleton's Bachelor of Industrial Design program. A survey conducted as part of this proposal has indicated that current students see this as an important option in their plans after completing their undergraduate degree. In addition, students from Carleton's Bachelor of Architecture and Bachelor of Information Technology (Multi-Media) will be suitable candidates for this opportunity.

The program has the potential to draw from a large pool of applicants. Preference will be given to selecting the best candidates and to putting together a cohort with a diverse range of design and design-related experience.

A.3. Other Master's Programs in the Field

There are many schools offering Master's programs in design. The following are well established and respected programs, and are well known within the profession. We have examined these programs in the development of ours.

A.3.1. Canadian Programs

- University of Montreal; Master of Science in Environmental Design
- Concordia University, Design Art Department; Graduate Certificate in Digital Design
- York University, Toronto; Master of Design (MDes), new in 2006-07
- Emily Carr Institute, Vancouver; Master of Applied Arts (MAA), new in 2006-07
- Ontario College of Art and Design (plans underway for new Masters program)
- University of Calgary, Department of Environmental Design; Master of Environmental Design (MEDes), four degree program options in Architecture, Environmental Science, Industrial Design, and Planning
- University of Alberta; Master of Design, two degree options in Industrial Design and Visual Communication Design
- Simon Fraser University, School of Interactive Arts and Technology; Master of Science in Interactive Arts, Master of Arts, and PhD

A.3.2. International Programs

- Arizona State University, College of Design; Master of Science in Design (MSD), three degree options in Graphic Design, Industrial Design, and Interior Design
- Carnegie Mellon University, School of Design; Master of Design (MDes), two degree options in Communication Planning and Information Design, and Interaction Design; Master of Product Development (MPD) jointly administered with the Department of Mechanical Engineering
- University of Cincinnati, College of Design, Architecture, Art, and Planning; Master of

Design (MDes), two degree options in Product Development, and Visualization
- Illinois Institute of Technology, Institute of Design; Master of Design Methods (MDM); Master of Design (MDes), three degree options in Communication Design, Product Design, and Design Planning
- Ohio State University, Department of Industrial, Interior, and Visual Communication Design; Master of Arts (MA) or Master of Fine Arts (MFA), two degree options in Design Development and Design Education; Master of Arts (MA) in Design Management and Planning; Master of Fine Arts (MFA) in Digital Animation and Visualization
- Stanford University, Joint Program in Design; Master of Science (MS) Engineering in Product Design and Master of Fine Arts (MFA) in Design Other international schools offering Master's programs in design include the following.
- Delft University of Technology (TUDelft), The Netherlands, Faculty of Industrial Design Engineering; Master of Science (MS) Integrated Product Design; Master of Science (MS) Strategic Product Design; Master of Science (MS)Design for Interaction
- Royal College of Art and Design, Great Britain; Master of Arts in twenty areas including Master of Arts (MA) Industrial design Engineering; Master of Arts (MA) Design Interactions; Master of Arts (MA) Design Products); Master of Arts (MA) History of Design
- UMEA University, Sweden; Master of arts (MA) Advanced Product Design; Master of Arts (MA) Interaction Design; Master of Arts (MA) Transport Design
- University of Art and Design Helsinki (UIAH), Finland, School of Design; Master of Arts (MA) in six areas including Master of arts (MA) Industrial and Strategic Design; Master of Arts (MA) Applied Art and Design; Master of Arts (MA) Spatial Design

Internationally, business schools are also recognizing the value of product design knowledge and capability. Business Week is planning several issues in 2006-2007 focusing on design, one of which focused on "The Best Design Schools" on October 2, 2006. This is the result of the 2006 World Economic Forum at which high profile executives made it clear that 'Design and Creative Innovation' are now viewed as critical elements to the overall success of their companies. While business leaders recognize that design improves the competitiveness of products, services and environments, there was only one Canadian school on Business Week's top sixty international "D-School" list of programs that teach design thinking and strategy. That was the University of Toronto's Rotman School of Business, which offers one elective in design at the Ontario College of Art and Design. This underlines the DIAC *Design Matters* Report observation that, "Designers are not typically involved in strategic decision-making [and that] designers need a sound understanding of the new realities of business if they are to help their clients to address specific business goals." (Refer back to sections A.1 and A.2.1.)

A Business Week article on April 18, 2005 entitled, *Why MBA's Learn the Art of Blue-Skying*, described a new joint program being offered by the leading European business school, Insead, just outside Paris, and the Art Centre College of Design in Pasadena. The program teaches the role of creativity and innovation in business decisions, and suggests that design may now be as important as corporate management. It is important to note that this sort of program aims to teach business people design-related skills, whereas the international design programs listed above, similar to this proposed program, teach designers how to more strategically integrate the value of design in the business environment.

It is with an understanding of this current emphasis on design and innovation that Carleton University's Eric Sprott School of Business, Department of Mechanical and Aerospace Engineering, and the Department of Systems and Computer Engineering's Technology Innovation Management program are particularly supportive of the MDes initiative.

A.4. The Undergraduate Bachelor of Industrial Design (B.I.D.) Program

The delivery of the graduate program and the experience of the graduate students will be supported in a unique way by access to the rich history and experience of one of the first and largest undergraduate industrial design programs in a Canadian university.

The School of Industrial Design was formed and began operations in September 1973, upon the recommendation of an Advisory Committee formed by Professor Donald A. George and Professor Douglas Shadbolt. Under the guidance of its first director, Professor Willem Gilles, the program was based on the guidelines of the International Council of Societies of Industrial Design (ICSID) and continues to evolve in parallel with ICSID tenets.

In September 2006, the School welcomed its 34th class of students. In April 2007, it will graduate its 31st class with a cumulative total of 610 graduates, the largest number of any industrial design program in Ontario and Canada.

Until 2003, the Carleton University's School of Industrial Design's undergraduate program was the only degree granting industrial design program in Ontario. Since then, Humber College and the Ontario College of Art and Design, both with undergraduate industrial design programs, began to grant undergraduate degrees as of the fall of 2003. However, Carleton University's School of Industrial Design is still the only program in a university environment and (this remains an important distinction) that makes the program unique. At Carleton, students can take a minor in business, psychology, fine art or other relevant disciplines in addition to their required courses in other university programs such as business, economics, psychology, math, and physics. It is the only degree program in the province, possibly in the country, with a Co-op program in which industrial design students can receive credit for sixteen to twenty months of design work experience. Students admitted to the current undergraduate program, as well as the master's program must be able to demonstrate the ability to succeed in a university environment.

The School of Industrial Design's undergraduate program continues to maintain strong ties with other Carleton University units including the Eric Sprott School of Business, Department of Mechanical and Aerospace Engineering, Department of Psychology, Department of Sociology and Anthropology, School of Architecture, School of Information Technology, and the Technology, Society and Environment Studies program. This allows it to continue to provide the widest educational opportunities in industrial design.

In his assessment of the School as part of the last Integrative Review, James Kaufman, external appraiser from Ohio State University, reported, *"This [undergraduate] program meets and exceeds many programs that I am familiar with in North America. Generally it compares to and may be included in a listing of the top ten public university programs of Industrial Design in North America."* The proposed graduate program would build on this established base and reputation.

A.5. Objectives of the Proposed MDes Program

The objectives of the MDes program are to foster knowledge in the advanced design principles and practices that contribute to the strategic value of design.

This is to be achieved through a program of study that will produce graduates who can positively affect the greater integration of design principles, methodologies, and interdisciplinary design development processes into private and public sector design business practice.

They will have the skill to conduct interdisciplinary design research and to manage resources to provide a design-based advantage. This program aims to teach designers to more effectively integrate design value into the business environment: it does not aim to teach business people

the process of design. Graduates will be prepared to play a strategic role in championing design in a variety of enterprises, including academic institutions.

A.5.1. Primary Learning Objectives of the Proposed Program

The program focuses on the following objectives:

i)   ***Design Research*** includes the study of methods for investigation, exploration and data collection such as; undertaking and differentiating between qualitative and quantitative data collection for design problems; examining discursive methods of critical analysis and practice; and employing emerging theories and practices in supervised research projects.

ii)   ***Strategic Design Planning*** includes the study of methods for planning, implementation and application such as; integrating strategic user observation analysis into design projects; identifying systems-related patterns for effectively planning design projects; merging relevant strategic design research and business practices; and integrating user-innovations with prototyping new services and products.

iii)   ***Knowledge Creation and Dissemination*** includes; expanding knowledge within critical design areas (e.g. Advanced Materials and Manufacturing Processes, Advanced Visualization, Product Interaction Design, Extreme Environments, Sustainable Design, Design and Culture, Design Management and Strategic Design Research, and Human-Oriented Design); writing and presenting papers; delivering workshops at conferences and seminars, funding permitting; and creating archival reference documents for industry such as case studies and technical reports.

iv)   ***Interdisciplinary Design Development*** includes the study and practice of methods that are used to foster collaboration across disciplines such as; working and contributing on projects in interdisciplinary teams; working on design projects with external public and private sector partners with a solid record of interdisciplinary development experience; and learning in "interdisciplinary-team-taught" courses.

A.5.2. Achievement of the Primary Learning Objectives of the Proposed Program

The learning objectives will be achieved through a sequence of core courses structured to provide the opportunity for balancing theory and practice and integrating these from different disciplines. The core courses offer a variety of pedagogical approaches such as project-based interdisciplinary studio activities, lecture-based methodology and theory classes with individual and/or team papers, a seminar class, field trips and interaction with leading practitioners, and international conference and workshop participation. The sequence is structured so that students learn the theory and principles in one course, such as the Interdisciplinary Design Development Seminar and apply it in a subsequent course, such as the Interdisciplinary Design Development Studio, as discussed further in section D. Students are also required to take three elective courses to deepen their knowledge in areas relevant to their thesis project. Finally, each student undertakes a supervised thesis project to apply and demonstrate the principles, research methods, and knowledge acquired.

All the core courses highlight interdisciplinary and/or collaborative work in theory or practice, where the term interdisciplinary refers to the cooperation between people in different disciplines to achieve common goals that integrate the expertise from those different disciplines. For example, the Interdisciplinary Design Development Studio will focus on projects undertaken by teams of students who are studying in different degree programs such as business, psychology, architecture, mechanical engineering, as well as the MDes program (see section A.6.1). In

addition, the core courses highlight a balance between technological, environmental (sustainable), cultural, and social concerns. To this end the core courses promote a primarily user-centered design research approach.

A.5.3. <u>Secondary Objectives of the Proposed Program</u>

In addition to the learning objectives, the School will fill recognized opportunities in design education as follows:

i)   ***Design Education at the Master's Level***

This program addresses the need for new graduate programs in design in Ontario highlighted by the 1996 Human Resources Development Canada report and the 2004 Design Industry Advisory Committee (DIAC) report mentioned in Section A.2. The objectives are to develop advanced design expertise that reflects a more interdisciplinary design development process and to facilitate the transition for students into the current requirements of the workforce.

Although the program has been proposed primarily to meet the needs of students in Ontario and Canada, a range of international students will also find the program attractive. In particular, the program has the potential to uniquely service students from the newly developing nations where there is a growing understanding of the link between design and the development of economic prosperity.

ii)   ***Preparation for Study at the Doctoral Level***

Some graduates of the program will aspire to undertake further study at the doctoral level. The first doctoral design program in the U.S. was offered by the Institute of Design at the Illinois Institute of Technology, beginning in 1993. Although there are still relatively few doctoral programs in design, discussion suggesting that the PhD is on the way to becoming the new terminal degree in the profession has taken place at recent conferences in North America and Europe. In Canada, students may be interested in the PhD programs in design offered by the University of Calgary and the University of Montreal. In addition, Carleton University's School of Architecture is currently developing a PhD program in design studies and this program will provide further opportunities.

While not sacrificing the learning requirements of the majority of students who will aim for a career path in professional practice, this objective is accomplished through a sufficient rigor in the research and writing requirements of the program. In particular, the Interdisciplinary Design Development Seminar course will provide students with training that prepares students for international publishing experience and presentation at international conferences.

iii)   ***Complement to the Bachelor of Industrial Design Program***

The proposed program builds on the existing strengths of the undergraduate program with the addition of developing strong skills in research. Students will have the opportunity to develop skills in depth in the areas of Advanced Materials and Manufacturing Processes, Product Interaction Design, Extreme Environments, Sustainable Design, and Human-Oriented Design. In turn, their research findings and expertise will contribute to the knowledge and skills imparted to students at the undergraduate level. The graduate students will interact with the relatively small undergraduate student population in different

capacities; as teaching assistants, as sessional instructors, as subject matter experts, and as project reviewers. (See sections A.6.4., D.1.5., and D.1.6.)

A.5.4. Strategic Goals of Carleton University

The strategic goals of Carleton University will support students and the successful development of the program in two ways.

Firstly, the University has been, and will continue to be, dedicated to raising its research profile. The Vice-President Research and International, Doctor Feridun Hamdullahpur, was recently recognized in the City of Ottawa for having facilitated Carleton's huge growth in research funding from $28 million in 2000 to more than $100 million in 2004. The June 2006 Preliminary Report of the Carleton University Task Force on Planning and Priorities affirms the University's intention to be one of Canada's pre-eminent research institutions and to support fundamental and applied research.

Secondly, the University is also dedicated to raising the quality of the graduate student experience. The Task Force Report confirms that the University will provide the support and flexibility necessary for graduate students to gain valuable experiences at conferences at home and abroad, in industry and with external agencies. It also plans to expand on current initiatives to allow graduate students to develop their teaching skills. In addition, the new position of Associate Dean (Student Affairs) in the Faculty of Graduate Studies and Research will focus on supporting graduate students.

These are two of the goals of the University that will continue to have a positive impact on the proposed program and its students.

A.6. Innovative Features of the Proposed Program

The innovative features of the proposed program relate directly to some of the objectives for the program. In each case, the aim is to provide students with a program of study that addresses a range of requirements to meet new demands in design education at the Master's level.

A.6.1. Interdisciplinary Aspects of the Program

The objectives of learning interdisciplinary design development processes involve integrating different disciplines and different people to achieve common goals. Graduates will be working on teams with non-designers in their future workplaces. However, in the university they mostly undertake design work with other designers. In the School of Industrial Design's Bachelor of Industrial Design program, and several other Canadian industrial design programs, there is no vehicle to integrate students enrolled in different programs of study into core design studio courses.

In this proposed program, after completing the Interdisciplinary Design Development Seminar, the Interdisciplinary Design Development Studio is structured to include students enrolled in other degree programs such as the revised Sprott School of Business MBA program, the Master in Psychology (concentration in Human Computer Interaction), and the Master of Engineering in Technology Innovation Management. Working on a design problem that crosses disciplines will provide experiential learning in interdisciplinary design development processes.

Furthermore, the extended core faculty of the program includes individuals who are members of different faculties and/or departments. In addition to the School of Industrial Design, core faculty come from the Sprott School of Business, the Department of Sociology and Anthropology, the Department of Psychology, and the Department of Mechanical and Aerospace Engineering.

These faculty members will be involved with the interdisciplinary student teams, and in some cases, in team-teaching.

Finally, many of the studio projects will be undertaken collaboratively with private sector partners with a solid record of interdisciplinary development experience who will participate in studio activities and/or consult with the students on a regular basis. The School has a long history of collaborating with public- and private-sector partners such as the National Capital Commission (NCC), Symbol Technologies, Bombardier, FilterStream, Black and Decker, DW Product Development, Smart Technologies, and others.

A.6.2. Research Resources and Facilities

The objective of expanding knowledge within critical design areas would be supported by new and updated facilities: the Research and Innovation Centre; the Manufacturing Labs & Resources; and the Studio environment.

i)   The Research and Innovation Centre was established by Willem Gilles, the founding Director of the School, as the Centre for Industrial Design Research (CIDR). It was to be the research and consulting arm of the School of Industrial Design at a time when it was largely the private-sector that was actively interested in research and development. This was an optimistic step for an undergraduate program, and it provided a prescient vision for the proposed graduate program.

The School is currently refocusing this vision with a new strategy for a Research and Innovation Centre that will meet the creative challenges involved in transforming design development opportunities into new design research opportunities.

It will be a place, physically and virtually, that will become a home for faculty research. At the same time, it will be a place where student researchers and entrepreneurs can work together with industry, government, and public research institutions to develop innovative ideas in ways that are socially and environmentally responsible. The Centre will not only cultivate and develop research, it will also assist in developing funded proposals, mentor new faculty and graduate students, educate potential external collaborators, and disseminate and archive design research knowledge.

The Research and Innovation Centre will be supported additionally by the Carleton University Office of Research Services and its Foundry Program. The Foundry Program is emerging as a leader in the commercialization of university research based innovations and can advise students in the critical areas of intellectual property protection and transference.

ii)   The existing Manufacturing Labs and Resources include sophisticated rapid prototyping capabilities, computer systems, equipment, and resources to support the design and development of three-dimensional and virtual prototypes. The newly funded (2006) Sensor Lab in the School of Industrial Design will allow for significant research into and development of interactive electronic prototypes and final proof of concept models. It will complement and support the design and generation of interactive products and systems. This is an advance over capabilities the School has had to date, as the undergraduate project final deliverables are typically appearance (not working) models and the new Sensor Lab allows for more sophisticated research and validation.

iii)   The state-of-art studio space for the graduate program is currently outfitted with some of the most advanced infrastructure to conduct leading edge collaborative networking. The availability of the infrastructure stems from a collaborative agreement with the Carleton Immersive Media Studio (CIMS). CIMS was established through a New Opportunities Canadian Foundation for Innovation grant awarded in 2002 and will be a primary research unit in the new CFI funded Centre for Advanced Studies in Visualization and Simulation slated to open in December 2006.

The existing infrastructure provides the ability for three-dimensional reconstruction and visualization of complex forms as well as the sharing of imagery across a series of connected networks. It is currently being used at the undergraduate level to conduct the collaborative design of a hospital room with a team in the U.S., and this project will serve as a precursor experiment for more advanced work at the graduate level.

It is also this infrastructure that will provide the potential for some students to conduct some of their course work and projects from and with others in remote locations, or for project teams to operate from satellite locations.

A.6.3. Knowledge Dissemination

The Design Research Society was established in the United Kingdom in 1966 as a "multi-disciplinary learned society for the design research community worldwide". It has taken forty years for this relatively young profession to achieve the level of scholarly publication enjoyed by peers in related disciplines. For example, the 2007 call for papers for the Computer Human Interaction (CHI) Conference of the Association of Computing Machinery marks the first time design has been included as an independent subject area. In the past, design publications focused more on visually documenting the outcome of projects, and less on documenting the research and theory behind them. In recent years, there has been a change, due in part to the requirement that academics in design fields meet similar criteria for publication and research as their colleagues in other fields. The increasing demand for scholarly papers in the design field will be addressed in the program through the mandate to present and publish design research findings, to document and archive publications, and to conduct workshops at local, national, and international conferences such as the National Education Conference organized by the Industrial Designers Society of America (IDSA), the Canadian Research Network (CDRN), and Canadian Design Engineering Network (CDEN).

In addition, the School plans to develop a Materials Research Library which will provide an opportunity for a collection of physical resources in advanced and sustainable materials and manufacturing processes. It will be a growing physical data-base of examples of materials, examples of three dimensional form possibilities, and a demonstration of the results of manufacturing processes under specific circumstances. This collection of past, present, and potential materials and processes will be a valuable resource for the graduate program, the undergraduate program, and for advanced design research.

A.6.4. The Cohesiveness of the Program

In any enterprise involving teams and collaborative work, the cohesion of the structure and the maintenance of collegiality are critical. The model of curriculum review that has evolved in the School at the undergraduate level provides for an annual review of all courses in relation to the overall objectives of the program. This enables the faculty to identify aspects of the curriculum that need to be redesigned and to ensure that all the courses weave together appropriately with adequate resources for their delivery. This process would be carried on at the graduate level.

In addition, the School of Industrial Design has a reputation for collegiality both in the interactions of faculty and students, and within the student body. Graduate students will be welcomed into, and be supported by, this mutually respectful network of colleagues. They will be encouraged to work closely with their cohort in a separate space in the Azrieli Pavilion, as the cohesiveness of this group is important. (see section C.2 for more information). They will also be integrated in the School through TA and Contract teaching positions, depending on individual qualifications, and through their participation in the Annual Industrial Design Seminar hosted by the fourth year students. (See sections D.1.5. and D.1.6.)

The School maintains connections with alumni, public and private sector professionals. The development of the program included consultations with these professionals, several of whom have expressed an interest in participating in the program in some capacity. A number of the alumni are involved as sessional instructors, TAs, and Co-op job providers at the undergraduate level. In addition, a representative cross-section of these School supporters will sit on the graduate program advisory committee to bring current design issues to the table.

A.7. Methodology Employed in Formulating this Proposal

This proposal was formulated over a four-year period beginning with a small committee in the School of Industrial Design. A first draft of the proposal was circulated among and discussed with the industrial design faculty, and different constituencies with an interest in such a program. These people included current students and past graduates; past and current employers of B.I.D. graduates the Director and Associate Director of the School of Architecture at Carleton, faculty members in Engineering, Psychology, and Sociology and the Deans of the Faculty of Engineering and Design and the Faculty of Graduate Studies and Research. A space was designated for the new program. By the fall of 2004, after several revisions, a draft of the proposal was submitted to the Program and Planning Committee of the Faculty of Graduate Studies and Research. Several revisions followed, and subsequent meetings were held with a cross-section of stake-holders and core faculty members. In March of 2006 a "mock-appraisal" team followed the OCGS appraisal guidelines to review the proposal. This proposal is the outcome of the feedback received from the mock appraisal.

B. THE FACULTY

B.1. Faculty Complement

Carleton University's School of Industrial Design has six full-time faculty positions. This is the largest number of any industrial design program, undergraduate or graduate, in Ontario and Canada. This is a significant feature of the School and the proposed program. This full-time complement, with the new senior hire, will ensure an unprecedented stability not equaled in other programs.

There are seven full-time core faculty members (Bailetti, Callahan, Given, Joslin, Lindgaard, Kumar U., Kumar V., Parush, Russell) based in other departments who are available and willing to participate in teaching and supervision of the graduate students in this program.

There are three core adjunct faculty members (Moore, Sharman, Thibaudeau) from other academic institutions and industry with supervisory privileges who will contribute expertise in the areas of anthropology, ergonomics, design and culture.

There are four full time faculty members (Chan, Goubran, Hajnal, Hayes) who have indicated support for the proposed program and who will be teaching courses and/or serving on advisory committees when research interests intersect.

In summary, a total of 23 faculty members are committed to be involved in the program.

This would be the largest complement of faculty for any design program in Canada.

Table 1. Faculty Members			
Faculty Name & Rank	**M/F**	**Home Unit**	**Supervisory Privileges**
Category 1			
Budd, James - Associate	M	School of Industrial Design	Master's
Burns, Brian - Associate	M	School of Industrial Design (SID)	Master's
Chung, WonJoon - Assistant	M	School of Industrial Design	Master's
Frankel, Lois - Associate	F	School of Industrial Design	Master's
Garvey, Thomas - Associate	M	School of Industrial Design	Full
Hallgrimsson, Bjarki - Assistant	M	School of Industrial Design	Master's
New Hire: July 1, 2008		School of Industrial Design	TBD
Category 2			
None			
Category 3			
Bailetti, Tony - Associate	M	SCE/School of Business	Full
Callahan, John - Associate	M	SCE/School of Business	Full
Given, Brian - Associate	M	Dept. of Sociology and Anthropology	Full
Joslin, Christopher - Assistant	M	School of Information Technology	Full
Kumar, Uma - Professor	F	School of Business/SID	Full
Kumar, Vinod - Professor	M	School of Business/SID	Full
Lindgaard, Gitte - Professor	F	Dept. of Psychology	Full
Parush, Avi - Associate	M	Dept. of Psychology	Full
Russell, Donald - Associate	M	Dept. of Mechanical and Aerospace Engineering	Full
Category 4			
None			
Category 5			
Moore, Tim - Adjunct	M	School of Industrial Design	Master's
Sharman, Lydia - Adjunct	F	School of Industrial Design	Full
Thibaudeau, Paul - Adjunct	M	Dept. of Sociology and Anthropology	Master's

Table 1. Faculty Members			
Faculty Name & Rank	**M/F**	**Home Unit**	**Supervisory Privileges**
Category 6			
Chan, Adrian - Assistant	M	Dept. of Systems and Computer Engineering (SCE)	Full
Goubran, Rafik - Professor	M	Dept. of Systems and Computer Engineering (SCE)	Full
Hajnal, Catherine - Assistant	F	School of Business	Full
Hayes, John - Assistant	M	Dept. of Mechanical and Aerospace Engineering	Full

Category 1:   tenured or tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review. For this purpose the master's and doctoral streams of a program are considered as a single program. Membership in the graduate program, not the home unit, is the defining issue.

Category 2:   non-tenure-track core faculty members whose graduate involvement is exclusively in the graduate program under review.

Category 3:   tenured or tenure-track core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 4:   non-tenured or tenure-trace core faculty members who are involved in teaching and/or supervision in other graduate program(s) in addition to being a core member of the graduate program under review.

Category 5:   other core faculty: this category may include emeritus professors with supervisory privileges and persons appointed from government laboratories or industry as adjunct professors.

Category 6:   non-core faculty who participate in the teaching of graduate courses.

B.2. Faculty Expertise

Each faculty member has a unique area of research expertise that they will contribute to the program and the combination of expertise has been determined to reinforce the interdisciplinary input needs required for the student's successful progression through the courses and into the final interdisciplinary design development project. Volume II; Curricula Vitae of this proposal provides more detailed information about the areas of expertise, however the following breakdown of key areas indicates the strengths the faculty bring to the proposed program:

    i)   Advanced Materials and Manufacturing Processes: Burns, Hallgrimsson.
    ii)   Advanced Visualization: Budd, Chung, Hallgrimsson.
    iii)   Design and Culture: Garvey, Given, Sharman, Thibaudeau.
    iv)   Design Management: Bailetti, Callahan, Hajnal.
    v)   Extreme Environments: Garvey.
    vi)   Human-Oriented Design: Budd, Burns, Chung, Frankel, Garvey, Hallgrimsson, Lindgaard, Moore, Parush, Russell.
    vii)   Product Interaction Design: Budd, Chan, Frankel, Goubran, Lindgaard, Moore, Parush.
    viii) Sustainable Design: Burns.
    ix)   Strategic Design Research: Budd, Chung, Frankel, Garvey, Hallgrimsson, Kumar, U., Kumar, V.

The faculty members in the School of Industrial Design (category 1) will deliver and co-ordinate the core courses offered by the School. Additional faculty members (categories 3 & 6) will be involved in providing occasional lectures, participating in select project reviews and advising students, as appropriate. The range of expertise from the academic units outside the School of Industrial Design (Sprott School of Business, Department of Mechanical and Aerospace Engineering, Department of Systems and Computing Engineering, Department of Psychology, Department of Sociology and Anthropology, and the School of Architecture) will be assembled in combinations relevant to the different final projects.

The adjunct professors (category 3) will also be involved in the delivery of lectures and will advise students. With proven careers in academia and industry, they will be instrumental in providing the critical links to current industry practice and external community liaisons.

Recent research-related activities in the School of Industrial Design will directly impact the quality of the proposed graduate program. Some key activities and projects that have been undertaken by faculty in recent years include: the production of an industrial design textbook used by several schools in North America entitled *Series and Mass Production Technology for Product Design* (De Leeuw); the *Canadian Design Engineering Network (CDEN)* curriculum and module development for engineering programs in universities across Canada (Burns); the *Technology Assisted Friendly Environments for the Third Age (TAFETA)* project in collaboration with the SCO Health Services (Frankel); the *Global University Programs for Healthcare Architecture (GUPHA) Acuity Adaptable Patient Room* collaborative hospital design project with Clemson University in South Carolina (Garvey); the design of a range of commercially successful products such as the *Infinity 500 Rollator* for Dana Douglas (Hallgrimsson); and the SSHRC funded collaborative interdisciplinary research project entitled *Managing E-Loyalty through Experience Design* (Budd).

B.3. Faculty Research Funding

Faculty members in the School of Industrial Design have continually looked to industry partnerships for funding opportunities and have been successful in this area. Working with industry has provided a great deal of valuable experience for students and has formed the basis for student experiences that have continued to support their smooth transition into the design workforce.

At the same time, Carleton University has made it a priority to create an improved research-intensive atmosphere through the provision of internal funds to support faculty research for those applying to external funding organizations. The Faculty of Engineering and Design, the Faculty of Graduate Studies and Research, and the School of Industrial Design provide support for travel to conferences and symposia, particularly when a faculty member has been invited to present an academic paper. Faculty members have received SSHRC grants, GR-6 grants from the Faculty of Graduate Studies and Research, and new faculty have received Carleton University *start-up grants*. Start-up grants awarded in the past three years total $75,000 for new faculty members.

Faculty in the Master's program will continue to take advantage of research funding opportunities available through the National Research Council (NRC), the Social Sciences and Humanities Research Council (SSHRC), the National Science and Engineering Research Council (NSERC), the Canadian Institute of Health Research (CIHR), the Canada Council, Ontario Centres of Excellence (OCE), and the Ontario Arts Council.

One recent project undertaken by Professor Frankel in collaboration with the Sisters of Charity Health Services was awarded $80,000 from the Change Foundation. In addition to Professor Budd's SSHRC-funded grant for $286,000.00 (*Managing E-Loyalty through Experience Design),* he has received a total of $150,000.00 U.S. spread over 4 industry sponsored collaborative interdisciplinary research projects. Adjunct Professor Sharman's multidisciplinary projects at Concordia University received funding of $203,000 over three years for research

connected with computational pattern recognition. Another significant E-Commerce project *(the Ontario Research Network for E-Commerce)* led by Professor Vinod Kumar has been awarded $2,800,000.00 over five years from the Ontario Research Development and Challenge Fund.

Over the past seven years Professor Lindgaard has been awarded more than $11,000, 000 as follows: $9,294840 from Granting Councils (including $1,185,000 for NSERC Industry Research Chair), $218,000 from Other Peer Adjudicated and $1,533,295 from other sources.

Success in professional practice is another mark of achievement in the field. The Gold-Design Engineering Awards 2001 and the Silver IDEA (Business Week) 2001 awards for design of the *Infinity Rollator* for Dana Douglas (Hallgrimsson) fall into this category.

These opportunities have encouraged creative solutions for funding support in areas of research interest. Examples of this are the research and development of ergonomic workstations (Burns) in collaboration with Nortel Technologies and the research into human computer interaction design issues (Frankel) in collaboration with Nortel Technologies.

The Research and Innovation Centre will be instrumental in providing support for current and new faculty to develop their individual and collaborative research programs in conjunction with the graduate program.

Table 2. Research Funding

Operating Research Funding by Source and Year

| Year | Granting Councils | Source | | |
		Other Peer Adjudicated	Contracts	Others
2000/01	148,410	0	0	58,460
2001/02	1,827,710	0	90,000	1,145,210
2002/03	7,641,710	0	0	95,410
2003/04	2,845,710	0	0	203,025
2004/05	88,500	0	30,000	131,000
2005/06	125,970	10,000	0	118,900
2006/07	384,000	208,000	0	225,941

B.4. Thesis Supervisions

Most of the core faculty in the School of Industrial Design have extensive experience supervising senior undergraduate projects which will provide a foundation for graduate supervision (refer to Appendix I for a list of major project supervisions for the past 7 years). Graduate thesis research projects will be supervised together with one core external faculty member with extensive experience in the supervision of graduate students. The new senior hire will take responsibility for coordinating supervisions and mentoring junior colleagues.

Table 3. Graduate Supervision						
Completed and Current Numbers of Thesis Supervisions by Faculty Member						
	Completed			**Current**		
Member	**Master's**	**PhD**	**PDF**	**Master's**	**PhD**	**PDF**
Category 1						
Budd, James	9	1		3		
Burns, Brian						
Frankel. Lois	1					
Garvey, Thomas						
Hallgrimsson, Bjarki						
Category 2						
None						
Category 3						
Bailetti, Tony	36			12		
Callahan, John	13			7		
Given, Brian	19	1		4		
Joslin, Christopher				2		
Kumar, Uma	59	2		8	8	
Kumar, Vinod	104	2		10	12	
Lindgaard, Gitte	13	2	3	2	8	
Parush, Avi	15	6		1	3	
Russell, Donald	15	2		4		
Category 4						
None						
Category 5						
Moore, Tim						
Sharman, Lydia		6		1		
Paul Thibaudeau						

Table 3. Graduate Supervision						
Completed and Current Numbers of Thesis Supervisions by Faculty Member						
	Completed			**Current**		
Member	**Master's**	**PhD**	**PDF**	**Master's**	**PhD**	**PDF**
Category 6						
Chan, Adrian						
Goubran, Rafik						
Hajnal, Catherine						
Hayes, John						

B.5. Faculty Teaching Assignments

A normal teaching load in the School of Industrial Design at the undergraduate level consists of the equivalent of 5 half-credit courses per year for each faculty member. The teaching load is divided between lecture and seminar courses and studio courses which may involve (at the fourth-year undergraduate level) supervising major projects. The Director of the School has a 1.0 credit reduction in teaching, and the Graduate Program Coordinator will also receive a 0.5 credit reduction in teaching. In addition, each faculty member has administrative responsibilities within the School.

As the School's primary focus has been the undergraduate program, all teaching assignments will be made with the intention of maintaining the high standard of the undergraduate program and balancing the teaching load between both programs. In addition to the new senior hire in 2008, the core School of Industrial Design faculty who will initially teach in the graduate program, as well as the undergraduate program include Professors Budd, Chung, Frankel, and Garvey. However, all core faculty members would participate in the Interdisciplinary Design Development Seminar and in an advisory capacity with respect to the critical issues and their areas of expertise. Graduate thesis project advisors will be assigned half-credit teaching course equivalence for supervising a normal load of 4 to 5 students.

Table 4 lists the courses (graduate and undergraduate) taught by each faculty member in the three preceding years.

Table 4. Teaching Assignments for 2004/05					
Faculty Member	**Rank**	**Undergraduate**	**Graduate**	**Credit**	**Comment**
Category 1					
Budd, James	Associate		IART 696	1.0	Simon Fraser
Budd, James	Associate	IAT 391		1.0	Simon Fraser
Budd, James	Associate	IAT 392		1.0	Simon Fraser
Budd, James	Associate	IAT 393		1.0	Simon Fraser

Table 4. Teaching Assignments for 2004/05

Faculty Member	Rank	Undergraduate	Graduate	Credit	Comment
Budd, James	Associate	IART 313/314/315		2.0	Simon Fraser
Budd, James	Associate	IAT 394		1.0	Simon Fraser
Budd, James	Associate	IART 407/408/409		1.0	Simon Fraser
Budd, James	Associate	IAT 232		1.0	Simon Fraser
Budd, James	Associate	IAT 832		1.0	Simon Fraser
Burns, Brian	Associate	IDES 1300		1.0	Studio course
Burns, Brian	Associate	IDES 1301		1.0	Studio course
Frankel, Lois	Associate	IDES 2203		0.5	Studio course
Frankel, Lois	Associate	IDES 3306		0.5	
Garvey, Thomas	Associate	IDES 4001		0.5	
Garvey, Thomas	Associate	IDES 4300		2.0	Studio course
Garvey, Thomas	Associate	IDES 3104		0.5	
Garvey, Thomas	Associate	IDES 3301		1.0	Studio course
Hallgrimsson, Bjarki	Assistant	IDES 3300		1.0	Studio course
Hallgrimsson, Bjarki	Assistant	IDES 2302		1.0	Studio course
Category 2					
None					
Category 3					
Bailetti, Tony	Associate	SYSC 4105		0.5	
Bailetti, Tony	Associate		TTMG 5001	0.5	
Bailetti, Tony	Associate		TTMG 5101	0.5	
Bailetti, Tony	Associate		TTMG 5104	0.5	
Bailetti, Tony	Associate		TTMG 5909	2.0	
Callahan, John	Associate	BUSI 3600		0.5	
Callahan, John	Associate	BUSI 4607		0.5	
Callahan, John	Associate		BUSI 5805	0.5	
Callahan, John	Associate		TTMG 5003	0.5	
Given, Brian	Associate	ANTH 3550		0.5	

Table 4. Teaching Assignments for 2004/05

Faculty Member	Rank	Undergraduate	Graduate	Credit	Comment
Given, Brian	Associate		ANTH 5403	0.5	
Joslin, Christopher	Assistant				Univ. of Ottawa
Kumar, Uma	Professor		BUSI 5805	0.5	
Kumar, Uma	Professor		BUSI 5902	0.5	
Kumar, Uma	Professor		BUSI 6801	0.5	
Kumar, Uma	Professor		BUSI 6902	0.5	
Kumar, Vinod	Professor				Director School of Business
Lindgaard, Gitte	Professor	PSYC 3800		1.0	
Parush, Avi	Associate	FYSM 1400		1.25	
Parush, Avi	Associate	PSYC 3800		1.0	
Parush, Avi	Associate		PSYC 6105	0.5	
Russell, Donald	Associate				Sabbatical
Category 4					
None					
Category 5					
Moore, Tim	Adjunct	IDES 3601		0.5	
Moore, Tim	Adjunct	IDES 2600		0.5	
Sharman, Lydia	Adjunct	IDES 1000		0.5	
Thibaudeau, Paul	Adjunct	IDES 3502		0.5	
Thibaudeau, Paul	Adjunct	ANTH 3730		0.5	
Category 6					
Chan, Adrian	Assistant				
Goubran, Rafik	Professor				
Hajnal, Catherine	Assistant				
Hayes, John	Assistant				

Note: James Budd was a faculty member at Simon Fraser University Fall 2005/Spring 2006
1.0 credit = 3 contact hours per week for one term

Note: Carleton University
Lecture course 0.5 credit = 3 contact hours per week for one term.
Studio courses 0.5 credit = 6 contact hours per week for one term.

Table 4. Teaching Assignments for 2005/06					
Faculty Member	**Rank**	**Undergraduate**	**Graduate**	**Credit**	**Comment**
Category 1					
Budd, James	Associate		IAT 832	1.0	Simon Fraser
Budd, James	Associate	IAT 308		1.0	Simon Fraser
Budd, James	Associate	IART 407/408/409		1.0	Simon Fraser
Burns, Brian	Associate	IDES 1300		1.0	Studio course
Burns, Brian	Associate	IDES 1301		1.0	Studio course
Burns, Brian	Associate	IDES 2102		0.5	
Burns, Brian	Associate	IDES 4007		0.5	
Frankel, Lois	Associate	IDES 4400		0.5	
Frankel, Lois	Associate	IDES 4310		1.5	Studio course
Garvey, Thomas	Associate	IDES 3306		0.5	
Garvey, Thomas	Associate	IDES 4306		0.5	
Hallgrimsson, Bjarki	Assistant	IDES 3300		1.0	Studio course
Hallgrimsson, Bjarki	Assistant	IDES 3305		0.5	
Hallgrimsson, Bjarki	Assistant	IDES 2302		1.0	Studio course
Hallgrimsson, Bjarki	Assistant	IDES 4310		0.5	Studio course
Category 2					
None					
Category 3					
Bailetti, Tony	Associate		TTMG 5001	0.5	
Bailetti, Tony	Associate		TTMG 5101	0.5	
Bailetti, Tony	Associate		TTMG 5104	0.5	
Bailetti, Tony	Associate		TTMG 5104	0.5	
Bailetti, Tony	Associate		TTMG 5901	1.0	
Bailetti, Tony	Associate		TTMG 5909	2.0	
Bailetti, Tony	Associate		TTMG 5909	2.0	
Callahan, John	Associate	BUSI 3600		0.5	
Callahan, John	Associate	BUSI 4607		0.5	

Table 4. Teaching Assignments for 2005/06					
Faculty Member	**Rank**	**Undergraduate**	**Graduate**	**Credit**	**Comment**
Callahan, John	Associate		TTMG 5003	0.5	
Callahan, John	Associate		TTMG 5909	2.0	
Callahan, John	Associate		TTMG 5909	2.0	
Given, Brian	Associate	ANTH 1001		0.5	
Given, Brian	Associate	ANTH 3550		0.5	
Given, Brian	Associate	ANTH 4000		0.5	
Given, Brian	Associate		ANTH 5403	0.5	
Given, Brian	Associate		ANTH 5907	0.5	
Joslin, Christopher	Assistant	IMD 2000		0.5	
Joslin, Christopher	Assistant	IMD 3004		0.5	
Kumar, Uma	Professor		BUSI 5805	0.5	
Kumar, Uma	Professor		BUSI 5902	0.5	
Kumar, Uma	Professor		BUSI 5908	0.5	
Kumar, Uma	Professor		BUSI 5908	0.5	
Kumar, Vinod	Professor				Sabbatical
Lindgaard, Gitte	Professor	PSYC 3800		1.0	
Parush, Avi	Associate	FYSM 1400		1.25	
Parush, Avi	Associate	PSYC 4800		0.5	
Parush, Avi	Associate	PSYC 4805		0.5	
Parush, Avi	Associate	PSYC 5106		0.5	
Russell, Donald	Associate		BIOM 5301	0.5	
Russell, Donald	Associate	MECH 3002		0.5	
Russell, Donald	Associate	MECH 4907		1.0	
Category 4					
None					
Category 5					
Moore, Tim	Adjunct	IDES 3601		0.5	
Moore, Tim	Adjunct	IDES 4001		0.5	

Table 4. Teaching Assignments for 2005/06					
Faculty Member	**Rank**	**Undergraduate**	**Graduate**	**Credit**	**Comment**
Moore, Tim	Adjunct	IDES 2600		0.5	
Sharman, Lydia	Adjunct	IDES 1000		0.5	
Sharman, Lydia	Adjunct	IDES 4001		0.5	
Thibaudeau, Paul	Adjunct	IDES 3502		0.5	
Thibaudeau, Paul	Adjunct	ANTH 2300		0.5	
Category 6					
Chan, Adrian	Assistant				
Goubran, Rafik	Professor				
Hajnal, Catherine	Assistant				
Hayes, John	Assistant				

Note: James Budd - Fall 2005 received administrative relief to chair the Undergraduate Curriculum Committee for a new
        school of 800 students.
Note: James Budd was a faculty member at Simon Fraser University Fall 2005/Spring 2006
        1.0 credit = 3 contact hours per week for one term
Note: Carleton University
        Lecture course 0.5 credit = 3 contact hours per week for one term.
        Studio courses 0.5 credit = 6 contact hours per week for one term.

Table 4. Teaching Assignments for 2006/07					
Faculty Member	**Rank**	**Undergraduate**	**Graduate**	**Credit**	**Comment**
Category 1					
Budd, James	Associate	IDES 4001		0.5	
Budd, James	Associate	IDES 4301		0.5	Studio course
Budd, James	Associate	IDES 1001		0.5	
Budd, James	Associate	IDES 3302		0.5	Studio course
Burns, Brian	Associate	IDES 1300		1.0	Studio course
Burns, Brian	Associate	IDES 1301		1.0	Studio course
Burns, Brian	Associate	TSES 4007		0.5	
Frankel, Lois	Associate	IDES 4400		0.5	
Frankel, Lois	Associate	IDES 4302		1.0	Studio course

Table 4. Teaching Assignments for 2006/07

Faculty Member	Rank	Undergraduate	Graduate	Credit	Comment
Garvey, Thomas	Associate	IDES 4310		2.0	Studio course
Hallgrimsson, Bjarki	Assistant	IDES 3300		1.0	Studio course
Hallgrimsson, Bjarki	Assistant	IDES 3305		0.5	
Hallgrimsson, Bjarki	Assistant	IDES 2302		1.0	Studio course
Category 2					
None					
Category 3					
Bailetti, Tony	Associate		TTMG 5001	0.5	
Bailetti, Tony	Associate		TTMG 5001	0.5	
Bailetti, Tony	Associate		TTMG 5104	0.5	
Bailetti, Tony	Associate		TTMG 5104	0.5	
Bailetti, Tony	Associate		TTMG 5901	1.0	
Bailetti, Tony	Associate		TTMG 5909	2.0	
Bailetti, Tony	Associate		TTMG 5909	2.0	
Callahan, John	Associate		TTMG 5909	2.0	
Callahan, John	Associate		TTMG 5909	2.0	
Given, Brian	Associate	ANTH 1003		1.0	
Given, Brian	Associate	ANTH 4900		1.0	
Joslin, Christopher	Assistant	IMD 2000		0.5	
Joslin, Christopher	Assistant	IMD 3002		0.5	
Joslin, Christopher	Assistant	IMD 4003		0.5	
Joslin, Christopher	Assistant		SYSC 5801	0.5	
Kumar, Uma	Professor		BUSI 5805	0.5	
Kumar, Uma	Professor		BUSI 5908	0.5	
Kumar, Uma	Professor		BUSI 5908	0.5	
Kumar, Uma	Professor		BUSI 6801	0.5	
Kumar, Vinod	Professor				Sabbatical
Lindgaard, Gitte	Professor	PSYC 4001L		0.5	

Table 4. Teaching Assignments for 2006/07					
Faculty Member	**Rank**	**Undergraduate**	**Graduate**	**Credit**	**Comment**
Parush, Avi	Associate	FYSM 1400		1.25	
Parush, Avi	Associate	PSYC 4800		0.5	
Parush, Avi	Associate		PSYC 5411	0.5	
Russell, Donald	Associate		BIOM 5301	0.5	
Russell, Donald	Associate	MECH 3003		0.5	
Russell, Donald	Associate	MECH 4907		1.0	
Category 4					
None					
Category 5					
Moore, Tim	Adjunct	IDES 3601		0.5	
Moore, Tim	Adjunct	IDES 2600		0.5	
Sharman, Lydia	Adjunct	IDES 1000		0.5	
Thibaudeau, Paul	Adjunct	IDES 3502		0.5	
Category 6					
Chan, Adrian	Assistant				
Goubran, Rafik	Professor				
Hajnal, Catherine	Assistant				
Hayes, John	Assistant				

Note: Carleton University
        Lecture course 0.5 credit = 3 contact hours per week for one term.
        Studio courses 0.5 credit = 6 contact hours per week for one term.

Table 5: Projections		
Course Number	**2008-09**	**2009-10**
IDES 5401	-	New senior hire (2008) et al
IDES 5302	-	New senior hire (2008)
IDES 5201	Garvey	Garvey/Frankel
IDES 5102	New senior hire (2008)	New senior hire (2008)
IDES 5101	Budd	Budd

C. PHYSICAL AND FINANCIAL RESOURCES

The undergraduate program is strongly supported by high-quality physical and financial resources. The graduate program will also be supported by these resources as well as additional ones. Thus current resources are identified with notes on relevance to the graduate program.

C.1. Library Resources

See Appendix II: Library Resources

C.2. Dedicated Graduate Program Space

Graduate students will be able to take advantage of the range of work and learning spaces currently utilized by the undergraduate program. They will have access to the undergraduate administration and production facilities listed below and will have their own mail and message boxes in the General Office. In addition they will have a dedicated graduate program space.

The Dean of Engineering has designated an 1100 square-foot room in the new Azrieli Pavilion for the proposed graduate program. This newly-built space can accommodate up to 20 graduate students in a natural-light studio setting similar to the undergraduate studios described below. However, in the first few years of the program, there will be a maximum of 15 students, each with their own desk and storage unit, in this graduate studio. As previously mentioned, the space is currently outfitted with an advanced infrastructure to conduct leading-edge collaborative networking. It will also contain 3 high-end computing systems and some fundamental model-making equipment. This equipment may include a band saw, drill press, spindle sander, scroll saw, and dust extraction system. Students have access to this studio 24 hours a day. The question of an additional meeting room, for faculty and students to meet to review work on an ongoing basis, is presently under review. At least one faculty office will be located in this new area. The program will grow in relation to the space and resources available to a maximum of 20 students in future years.

C.3. Design Studios, Teaching Rooms, and Offices

The School of Industrial Design is located in the Mackenzie Building and all the School's facilities, with the exception of the Wood Fabrication Laboratory, are housed on the first and second floor of the fourth block that is joined to the School of Architecture.

C.3.1. Design Studios

Three design studios are the prime spaces for the delivery and the experience of design education at the undergraduate level. First-and second-year students share one studio which is also their main meeting space outside studio hours. This studio accommodates 18 students and schedules are designed to optimize use of the studio space in the first two years. Third-and fourth-year students have dedicated desks and storage compartments in two other studios which each accommodate approximately 35 students. The third- and fourth-year studios have a teaching area, a common work area, a computer area, and a small meeting space that contributes to the collegiality of the studio environment. These small meeting spaces are open 24 hours a day and are almost always alive with student activity.

C.3.2. Teaching Rooms

There are three teaching rooms varying in size that accommodate teaching, reviews of student work, and meetings with students.

The largest teaching room is the *Review Room* in which the majority of reviews of student work are conducted. The room has presentation space on four sides for displaying work and can accommodate 40 to 50 people in a seated arrangement. It is well equipped with presentation screens, a mounted LCD projector and dedicated computer, and an Internet connection. There is also storable lighting equipment for product photography, and storage capacity for teaching and historical archival materials.

There is a mid-sized room named the *Seminar Room*. The Annual Industrial Design Seminar was held in this room for many years in the early history of the School. This room, recently re-designed and re-equipped under the guidance of Professor Bjarki Hallgrimsson, accommodates approximately 20 people in a variety of alternate configurations for group meetings and discussions, and small group presentations. The room is supported by a state-of-the-art *Smart Board* provided by Smart Technologies. There is also a small teaching and meeting *Conference Room* that accommodates small groups of 4 to 6 people for committee meetings or small team student projects.

C.3.3. Offices

Currently, there are six faculty offices, including the Director's office. As additional faculty members are hired similar offices will need to be found for them. There are two administrative offices. The *General Office* is the front line for student contact with an administrator (Administrative Assistant) and for communicating with faculty. It is also home to a valuable resource centre for students with a collection of current design magazines and past project documentation that can be borrowed by students to support ongoing projects. A second administrative office (School Administrator) handles other specific administration. In addition there is a technical support office for the current technical support person that contains the School's computer and network servers.

C.4. Laboratory Facilities

The School's laboratory facilities are an integral part of the program for research and teaching at both the undergraduate and graduate levels. The labs enable faculty, staff and students to experiment with and develop three-dimensional models that communicate design opportunities. It is important for the labs to provide current and state-of-the-art equipment and resources to enable students to graduate with design skills appropriate to the profession.

On many occasions the broader conceptual framework of the graduate program projects will be presented using advanced visualization and prototyping methods. This will be accommodated largely within the current facilities. The recent acquisition of newer rapid-prototyping equipment, and the intention to introduce additional new equipment and update older equipment, will be valuable to the graduate program as will access to other prototype fabrication facilities on campus, such as the Science and Technology Centre. These facilities will support the more sophisticated three-dimensional exploration expected at the graduate level.

C.4.1. Laboratory Policy

The School of Industrial Design always seeks to operate the most appropriate range of laboratory facilities that are critical for translating design concepts into three-dimensional realizations: exploratory models; functional and appearance models; ergonomic and structural test models; and rapid prototyping high-fidelity CAD models. Students are expected to participate and work in the labs at specific phases in their studio project assignments.

C.4.2. Laboratory Facilities

The laboratory facilities are staffed by three full-time technicians, with distinct expertise, who are responsible for: providing all students with an initial safety-training course on facility equipment and use, overseeing the operation of facilities and procurement of materials for student projects, and advising students on optimum ways to plan and execute fabrication of prototypes of their work. The technicians are highly supportive of, and well respected by, students. The safety record of the facilities is excellent.

All laboratories are open and fully supervised from 08:30 – 16:30. Three of them (*) are also available for 24-hour use by arrangement. The Labs include:

- Plastics and Composite Materials Fabrication Laboratory
- Metal Fabrication Laboratory
- Wood Fabrication Laboratory (Architecture Building)
- Product Testing Laboratory*
- Product Assembly and Finishing Laboratory*
- Spray Painting Facility*
- Rapid Prototyping Facility
- Sensor Lab (under development)

C.5. Network, Computer, and Audio-Visual Equipment/Systems

Design processes are fundamentally affected by all the electronic technologies that significantly contribute to the conception, production, evaluation, and dissemination of design thinking. Thus, the School of Industrial Design continues to maintain current systems, in line with industry standards, and equip its students with the best of these technologies on a regular basis.

C.5.1. Design Computing Offerings

Most recently, the School's design studios, teaching rooms, offices, and production facilities have all been equipped with wireless systems to enhance access to computer networks and a range of peripheral input/output devices and software such as scanners, CAD and image manipulation software, and printers. This provides students with unprecedented freedoms for completing both individual and collaborative design projects. These systems are available to studio students 24 hours a day both on computers provided by the School and through individual access from personal laptops, which the majority of students now have.

The graduate student studio described in section C.2. will be located in the new $17 million David J. Azrieli Pavilion and will benefit from the advanced technology infrastructure already in place in the four large lecture halls, specialized computer laboratories and workrooms, and state-of-the-art classrooms, teaching studios and seminar rooms for graduate and undergraduate instruction. The three new high-end computer systems that will be provided in the graduate student studio provide the foundation for an Advanced Visualization lab that will augment the interactive electronic design capabilities of the new Sensor Lab.

The School has three *Smart Boards*, provided by Smart Technologies, which can be synched with computers and LCD projectors, and Carleton's WebCT web-based learning environment to allow for interactive electronic design development and presentations. An additional *Smart Board* has been offered by Smart Technologies to be dedicated to the graduate program space in the Azrieli Pavilion.

Equipment and services for students of the School of Industrial Design are also available from Carleton University's Instructional Media Services (IMS) and the School of Architecture. IMS provides a range of digital equipment for capturing and processing digital design data as well as

professional services for editing this data. The School of Architecture provides both digital and analogue photographic equipment, a 12-station darkroom, a full range of black and white photographic services, an equipment loan pool and a video laboratory; and is staffed by a full-time manager, who also provides instruction.

C.6. Administrative and Technical Support

The School of Industrial Design has two full-time administrators. The Administrative Assistant is stationed in the *General Office* and responds to student and faculty daily concerns, operates the resource centre, and helps with equipment and room bookings. The School Administrator, who now maintains the school budget, oversees student registration, course audits, and the school web site, will also serve as the Graduate Program Administrator. This will require additional administrative responsibilities and a redefinition of both administrative job descriptions to accommodate those responsibilities. The School Administrator brings experience in this capacity from a previous position as Graduate Program Administrator in the School of Mathematics and Statistics at Carleton. Currently a half-time technical support person is available for computing issues and commitment has been made to add an additional full-time technical support position for the graduate program. Through funding proposals it is expected that another half-time position will be created for the part-time administration of the Research and Innovation Centre and Graduate Program.

C.7. Financial Assistance for Graduate Students

There are several funding opportunities available for graduate students in this program. The Faculty of Graduate Studies and Research has made a commitment to fund at least six students a year with teaching assistant awards that are currently valued at $8,562.15 (fall/win), to a maximum of twelve yearly for students in both years of the program. Sessional contracts may also be awarded to graduate students with professional expertise applicable to teaching in the undergraduate program.

The University will also provide scholarships for the first year of study for the best of these students which typically means between $2000 and $5000/year per student. Students with a GPA of 11 or more will receive a domestic tuition scholarship. In addition, graduate students in the Faculty of Engineering and Design, and thus the School of Industrial Design, are eligible for University awards and are encouraged to apply for Ontario Graduate Scholarships, NSERC, SSHRC, and CIHR awards. It is expected that many of the graduate design projects will be developed in partnership with one or more industry partners. In such cases industry partners will be required to contribute between $10,000 and $15,000 to participate in a given project, based on the guidelines developed for the undergraduate student/industry projects. Faculty contracts or research grants may also provide money for graduate students.

It is important to note that many professional masters programs indicate that applicants cannot expect individual funding support for their studies. In this program, funding levels will be comparable to other SSHRC-funded units on campus.

D. PROGRAM REGULATIONS AND COURSES

D.1. Intellectual Development of the Student

D.1.1. Faculty Advisors

Upon acceptance to the program each graduate student will be assigned a faculty advisor based on the statement of intent submitted with his or her application. The student will have four months (one semester) to find another advisor if he or she wishes. Each student will be encouraged to develop his or her personal elective curriculum in consultation with that advisor.

D.1.2. Structured Curriculum

The first three semesters of the program provide a structured curriculum that addresses the four learning objectives of the program: Design Research; Strategic Design Planning; Knowledge Creation and Dissemination; and Interdisciplinary Design Development. The sequence of the curriculum allows for courses that introduce theory, followed by courses that afford the students the opportunity to apply the theory. This is outlined in more detail in section D.5. At the end of each school year, the Graduate Program Committee, in consultation with each thesis project advisor will review the status of each of the thesis projects.

D.1.3. Thesis Project Proposal Consultation

In the fall of the second year of study each student will develop his or her thesis project proposal in consultation with his or her advisor, and submit the proposal to the Graduate Program Committee, consisting of the core faculty, for approval. It is expected that faculty advisors will have suggestions for individual and/or group projects based on their own research interests, and/ or their ties with public and private sector partners. The thesis project proposal submission provides the opportunity for the faculty members to find out about the nature of the proposed projects, and to identify links between the undergraduate program, the graduate program, and their research programs. At the same time, it provides valuable feedback for the graduate student to refine and/or redirect their thesis project proposal before beginning the project in the final semester of the program. It also allows students to complete a great deal of their thesis project research, giving them sufficient time to complete their thesis projects in the next twelve weeks.

D.1.4. Thesis Project Advisory Committee

In the early years of the program each thesis project will have an advisory committee consisting of the Senior Advisor and a Co-advisor as well as one advisor who is external to the School of Industrial Design, but internal to the university. After three years of thesis project defenses, when the School of Industrial Design faculty members have gained more supervisory experience in the graduate program, the co-advisor requirement will be reconsidered. In any case, when the student is ready to defend the thesis project, another external committee member will be chosen by the Senior Advisor in consultation with the student.

D.1.5. Peer Learning

Graduate students will be expected to have a regular presence in the studio to benefit from peer learning as well as interactions with professors. The peer-learning model is the underlying principle behind studio classes in which students working on their projects have the advantage of engaging in and learning from critical discussion, interaction, and problem solving with peers and professors. In addition, graduate students will be invited to present research-in-progress talks to the student body at regular informal gatherings, and to participate in the annual undergraduate seminar (see section A.6.4). They will also be encouraged to present papers and workshops at conferences and seminars, with funding support made available to them.

D.1.6. Integration into School Environment

The graduate students will be integrated into the daily workings of the School in many ways. Those with previous design expertise may be offered sessional teaching contracts, teaching or research assistantships, as appropriate (see section A.6.4. and section C.7.). The graduate students will have representation on the School of Industrial Design Faculty Board. Until the graduate students reach critical mass, they will be encouraged to become members of the Carleton Industrial Design Student Association (CIDSA) which sponsors guest speakers, film nights, and school events.

D.2. Program Regulations

D.2.1. Admission Policy

The general admission policy for the *Master of Design (MDes)* program, reflecting the objectives of the program, has been established in order to be as inclusive as possible. Thus, the admission requirements have been carefully formulated to reflect this policy while at the same time ensuring the maximum opportunities for success of graduates after completion of the program.

D.2.2. Application Procedures

All applications to graduate programs in Ontario must go through the Ontario Universities Application Centre (OUAC), which can be accessed through the Faculty of Graduate Studies and Research or the School of Industrial Design web site. The OUAC application form must be filled out on line and submitted electronically. After that, the student is required to print out a hard copy of the application and submit that to the School of Industrial Design.

All applicants for admission will initially be examined and evaluated by the School of Industrial Design. The Graduate Program Committee of the School of Industrial Design, chaired by the Graduate Program Coordinator, will review the materials submitted to the School. The committee will approve admission or conditional admission, or admission may be denied. Completed applications of those students the School wishes to recommend for admission will be forwarded to the Dean of the Faculty of Graduate Studies and Research for consideration. The office of the Dean will officially notify each applicant whose admission is approved.

Applications must be received according to the respective Application Schedules and must meet the Admission Requirements of each.

The number of admissions is limited by the availability of graduate space and supervisory personnel. Possession of the minimum admission requirements does not, in itself, guarantee admission. Priority will be given to applications of the highest quality and relevance.

D.2.3. Application Schedules

All application materials must be submitted to the School of Industrial Design by February 1 for consideration for admission to the fall semester. Applicants wishing to be considered for financial assistance from Carleton University must submit their completed applications to the Faculty of Graduate Studies and Research by March 1.

D.2.4. Admission Requirements

Graduates of recognized universities will be considered for admission to the Faculty of Graduate Studies and Research. The University's general policy on admission as outlined in Section 2.1 of the General Regulations in the Graduate Calendar must be met. For admission to the *Master of Design* program, applicants must hold a bachelor's degree in a design discipline, or the equivalent, with at least a B+ standing.

Applicants with a design-related background, but not a professional degree in design, will be required to demonstrate significant links between their academic background and professional experience in the design development process.

Applicants must provide the following materials to the School of Industrial Design.

Application Form

Applications forms will be completed on-line at the School of Industrial Design website.

Statement of Intent (1 page)

The quality of the statement of intent is critical to the likelihood of an applicant's admission. The writing should be succinct and as carefully considered as the content of the statement, which should address at least the four following areas:

- What is the area of intended research with specific reference to the program courses and the expertise of the faculty members,
- How the applicant's academic background and professional experience relates to the program with reference to any previous research, scholarship, or project experience with interdisciplinary or collaborative teams,
- How the intended research program will align with the objectives of the program relating to Design Research; Strategic Design Planning; Knowledge Creation and Dissemination; and Interdisciplinary Design Development.
- An explanation of the specific reasons for choosing the School of Industrial Design at Carleton University.

Portfolio

The portfolio should provide the best examples of creative intellectual activity and recent professional work that indicates the applicant is sufficiently prepared to pursue studies in the program. These activities may be represented by proposals, reports, and/or analysis documents. Emphasis should be placed on evidence of understanding the communication of design ideas in visual form.

The presentation of the portfolio should be professional and facilitate the review process of the content, and should be submitted wherever possible in a digital format. Any hard copies should be in an 8.5" x 11" format.

Three Letters of Recommendation

Applicants must provide three confidential letters of reference appended to prescribed recommendation forms.

Certification of Proficiency in English

The Faculty of Graduate Studies and Research requires applicants whose first language is not English to provide certification of proficiency in English in one of four ways, as described in Section 3.6 of the General Regulations in the Graduate Calendar.

D.2.5. Financial Assistance

Applicants with a Grade Point Average (GPA) of 11.0 or better are eligible for financial assistance for their studies in the form of a teaching assistantship and/or a scholarship.

D.2.6. Qualifying Studies Program

Applicants with admission deficiencies would be required to successfully complete additional prescribed courses to qualify for admission. Applicants without a professional degree in design may be required to register for up to 2.0 credits of courses selected from the undergraduate *Bachelor of Industrial Design* program, in consultation with the Graduate Program Co-coordinator.

The courses would be chosen from a selection of Design History and Analysis, Mass Production Technology, Ergonomics, or Industrial Design and Architecture electives. Upon successful completion of these courses, students would normally be admitted to the *Master of Design* program.

D.2.7. Program Requirements

The *Master of Design* program requires the successful completion of 5.0 credits with at least 4.0 credits taken at the 5000 level or higher. The Graduate Program Coordinator must approve course selections. The program may be completed in four terms of study.

Term 1: Fall Semester [1.0 credits]

IDES 5101 Interdisciplinary Design Development Seminar [0.5 credit]
IDES 5102 Research Methods [0.5 credit]

Term 2: Winter Semester [1.5 credits]

IDES 5201 Interdisciplinary Design Development Studio [0.5 credit]
Elective 1 [0.5 credit]
Elective 2 [0.5 credit]

Term 3: Fall Semester [1.0 credits]
IDES 5302 Thesis Proposal [0.5 credit]
Elective 3 [0.5 credit]

Term 4: Winter Semester [1.5 credits]
IDES 5401 Thesis [1.5 credits]

D.2.8. Thesis Requirements

In every case, student theses will provide ample opportunity for individual students to fully meet the objectives and interdisciplinary requirements of the program, and to accommodate individual student research interests as indicated in their letter of intent.

The planning of the theses will reflect the availability of supervisors and external industry partners, and the particular research interests and professional experience. As the number of students reaches a steady state of 20, the variety of project choices will be expanded significantly.

Thesis Selection

After successfully completing the requirements of the first two terms of study, students planning to enroll in *IDES 5302 Thesis Proposal* in the following fall semester will begin to consult with the thesis advisors, and potential external industry partners. Students may choose to work on an individual thesis or, where numbers permit, within a thematically related team.

Evaluation Procedures

A set of written guidelines for thesis preparation will be made available and students are expected to develop drafts of their proposal in consultation with their supervisor and the Graduate Program Committee while taking *IDES 5302 Thesis Proposal.* The proposal outlines the scope of the proposed topic, the hypothesis to be advanced, the methodology to be employed, the chief sources to be consulted, including an annotated bibliography and an approximate timetable of research activity and writing. The student will hand in the written proposal to their advisors and

present an overview of the proposal to the Graduate Program Committee. The student will subsequently receive a grade of SAT or UNSAT along with recommendations for improvement. A grade of SAT allows the student to register in *IDES 5401 Thesis* in the following semester.

Thesis Deliverables

Each student will be required to submit a final thesis consisting of an executive summary and specified written and visual documentation of all thesis phases. The thesis will constitute important portfolio work for the student and a growing record for the School of Industrial Design. A web-based version will be required and will be made available publicly through the School of Industrial Design's website. The thesis documentation will be graded Pass With Distinction, Satisfactory, or Unsatisfactory.

Oral Examination

An oral examination is required for all students in the *Master of Design* program. The thesis advisors and one other member of the Graduate Program Committee will form the examining board. The board will designate a grade of *Satisfactory* or *Unsatisfactory* for the oral examination.

D.2.9. Residency Requirements

Students can fulfill their residency requirements by taking eighty per cent of their courses at Carleton University. After the program is well established it is anticipated that under special circumstances students enrolled in the program can complete their residency requirements by means of networked collaborative technologies and procedures.

D.2.10. Time Limits for Program Completion

It is anticipated that full-time students will complete all program requirements within two calendar years after the date of initial registration. It is anticipated that part-time students will complete all program requirements within six calendar years after the date of initial registration. A master's candidate who elects to complete his/her program by a combination of full-time and part-time study is governed by the following elapsed-time limitations: five calendar years if the candidate is registered as a full-time student for two or three terms and part-time for the balance; four calendar years if the candidate is registered for four or five terms as a full-time student and part-time for the balance. Should a situation arise where a student is unable to complete the requirements within the specified timeframe he or she would be able to maintain continuous registration until the thesis requirement has been completed. Regulations on maximum time limits for completion of programs and extensions to time limits can be found in Sections 8 and 13 of the General Regulations in the Carleton University Graduate Calendar.

D.3. Part Time Studies

The expectation is that the majority of the students will normally be enrolled full-time. However, part-time studies are anticipated to be an important option in the *Master of Design* program. Some of the prospective students will be practicing professionals in design professions and others. Some may wish to remain employed while developing enhanced professional expertise through the pursuit of additional academic studies. Students who wish to study part-time will be expected and able to plan an individual program of study within the prescribed structure of the program. All core courses will be offered on a yearly basis. Elective course offerings are sufficient to suit a wide range of individual programs of study.

In recognition of the importance of part-time and employed students, consideration will be given to offering core courses in the late afternoon or early evening. Additionally, the relatively small size of the program and the dedicated availability of facilities governed by the School of Industrial Design will make it possible to establish timetables at the beginning of each term to

accommodate the needs of the greatest number of part-time and employed students. No weekend or summer courses are presently anticipated for the program.

Given the small student numbers anticipated in the graduate program, part-time admissions will be managed with due consideration for the capacity of the program.

D.4. Courses Offered

D.4.1. Required Courses

Students must complete a total of 5 credits, of which 3.5 credits are required courses in the MDes program and 1.5 credits are electives outside of the school. Four of the required courses (for a total of 2 credits) offered by the School of Industrial Design (IDES 5101, IDES 5102, IDES 5201, and IDES 5302) must be completed prior to enrollment in IDES 5401, which is worth 1.5 credits. This requirement ensures the requisite understanding of all key issues that will be required for successful completion of the thesis project in IDES 5401.

The sequence of IDES 5101 and IDES 5102, followed by IDES 5201, provides an opportunity to learn new knowledge, to test it and to apply it in course assignments and projects. The courses examine and incorporate design research, strategic design planning, knowledge creation and dissemination, and interdisciplinary design development principles and methods across a wide range of evolving lifestyle and business opportunities.

IDES 5101 Interdisciplinary Design Development Seminar [0.5 credit] (New)
Investigation of disciplines involved in design development, with experts in Business, Engineering, Sociology/Anthropology, Architecture, Psychology, Human Factors, Industrial Design, and others. Includes a critical examination of methods used to integrate different approaches, and roles that personality, leadership, negotiation, conflict management, and teambuilding play in collaboration.

Rationale: As an introduction to the challenge of leveraging design to establish and sustain competitive advantage the course focuses on two main issues: strategic design planning in different disciplines and methods for interdisciplinary collaboration. Students learn about the distributed network of professionals who are involved in transforming opportunities into successfully marketed realities. Faculty from other disciplines on campus, who are involved in this process, will participate. Students study the mechanisms of successful teamwork that will be important for working together in the subsequent studio project in IDES 5201. Students will have reading assignments, papers, and a small team presentation.

IDES 5102 Research Methods [0.5 credit] (New)
Critical analysis of research methods relevant to design. Students will develop critical analytical skills through research. Methods are drawn from disciplines contributing to design including anthropology, psychology, sociology, and business. Hands-on experience will be provided through course assignments in areas such as Advanced Materials and Manufacturing Processes, Advanced Visualization, Product Interaction Design, Extreme Environments, Sustainable Design, Design and Culture, Design Management, and Human-Oriented Design.

Rationale: The course is central to establishing a solid foundation in research skills and prepares students for establishing proper links between research and their project work. Emphasis is placed on how design research informs us about the people who use the products of design the importance of user centered knowledge. Topics address issues in project framing and development, design research methods and issues, current debate on the state of design research, applied design research in the context of business and entrepreneurship, the use of traditional and electronic research resources, and innovative, design-based methods of project documentation.

IDES 5201 Interdisciplinary Design Development Studio [0.5 credit] (New)
Team-based studio projects draw on interdisciplinary design development methods in achieving a
common design objective. Projects will be supervised by academic and industry advisors from a
wide range of disciplines, and conducted in collaboration with professionals from external
organizations. Open to students from other programs. Pre-requisite IDES 5101 and IDES 5102 or
permission of faculty.

Rationale: Collaboration in design development is extensive and indispensable in most
design development practices today but can vary across disciplines and a wide range of business
environments such as private consultancies, corporate design groups, research institutions, and
government agencies. The course is mandatory for graduate students in the MDes program.
Through consultation with other Carleton departments, the course has been structured to include
graduate students studying in different degree programs such as business, psychology,
architecture, and engineering. In this studio student teams will work on a strategic design problem
that addresses one or more key design research areas identified as areas of expertise in the
program. A final report and physical or virtual model will be required.

IDES 5302 Thesis Proposal [0.5 credit] (New)
Critical investigation into a theoretically and practically interesting and relevant research problem.
The student will analyze and synthesize the findings involving interdisciplinary design
development processes and develop these into a thesis proposal. This course is a directed study
with specific content, objectives, and scheduling arranged between student and academic
advisors. Pre-requisite IDES 5101, IDES 5102, and IDES 5201.

Rationale: This course provides the opportunity to apply the knowledge acquired in the core and
elective courses to a research area of personal interest to the student that draws upon the
expertise available in the program. In consultation with the advisors and, where appropriate, other
professionals, the student will develop the rationale for what they intend to focus on, why it is
significant within the context of interdisciplinary practices and research, and how it will be done.

IDES 5401 Thesis [1.5 credits]
A comprehensive project that demonstrates the student's ability to conduct critical research in a
specific area in which design can contribute to competitive advantage through design planning
and interdisciplinary design development processes.
Prerequisites: IDES 5101, IDES 5102, IDES 5201, and IDES 5302.

Rationale: The thesis provides the opportunity for a tangible demonstration of the outcome of the
research by way of visual communication media which could include a three-dimensional product,
web site, multi-media, or other means of representation. It must be accompanied by a thoroughly
researched written document.

D.4.2. Electives

Students must complete three elective courses for a total of 1.5 credits. A list of recommended
courses that are relevant to the design development process and/or the required courses is
available in Appendix III. Examples include the following.

Directed Studies in Industrial Design
Creative Problem Solving in Design
Seminar in Marketing
Psychological Aspects of Computer Use
Sociology of Science and Technology
The Anthropology of Signs and Symbols
Health Care Engineering
Engineering Management

Integrated Product Development
Management Principles for Engineers
Topics in Design & Multimedia
Design and Culture Workshop
Architecture Seminar
Technical Studies in Heritage

E. OUTCOMES

E.1. Projected Enrolment and Graduations

As this is a proposal for a new program, projected enrolment and graduation numbers are based on resources currently designated for the program and interest in the program received thus far from prospective applicants.

The physical and financial resources, specifically the availability of graduate studio space and faculty resources to deliver the program at the highest levels of quality, will constitute the prime determinant. Thus incoming enrollments will be restricted to seven full time students in the first years of the program with the intention of achieving an eventual steady state of 20 students in the program after seven years. It is anticipated that after reaching a steady state of 14 students the School will receive an eighth faculty member and more studio space.

There has been a strong and steady interest from recent and past graduates of the undergraduate program of the School of Industrial Design at Carleton University as well as from graduates of other undergraduate university and college design programs across Ontario and Canada. International students have also made inquiries into the program. There should be no shortage of qualified applicants.

It is anticipated that full-time students will constitute the majority of a given year's cohort. However, the program will accommodate a small number of part-time students as well as students who must change their status from full- to part-time while enrolled, with due consideration for the capacity of the program.

Table 6: Projected Flow Through							
Status	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Year One	7	7	8	8	9	10	10
Year Two		7	7	8	8	9	10
Full time	5-6	11-12	12-13	13-14	14-15	16-17	17-18
Part time	1-2	2-3	2-3	2-3	2-3	2-3	2-3
Total	**7**	**14**	**15**	**16**	**17**	**19**	**20**

E.2. Projected Cohort Structure

In acknowledgment of changing demographics in the industrial design profession, and other design disciplines at large, and based on trends in the undergraduate program to date, it is anticipated that female students will make up 50% of the cohort. To compliment the program's

objectives, international students are equally welcome and ideally at least one new international student per year will be accepted to the program. There will be a quota governing the number of new domestic Master's students in the program each year.

E.3. Projected Employment of Graduates

As this is a new program, there are no internal statistics to draw upon to validate employment outcomes for graduates of the program. Based on anecdotal results from similar programs it is anticipated that that graduates will be well prepared to play a strategic role in championing design in one of five career paths.

- Primarily graduates return to or join a design practice or large organization with the ability to foster interdisciplinary design projects in strategic and emerging areas. They work in a senior capacity in design research and planning, innovation strategy, design research or design management as evidenced by the turnover in jobs advertised on Coroflot (see section A.2.3.)
- Other graduates return to working as a designer or join a design practice with a reinvigorated user focused or visionary design perspective. This is a pattern often seen when mid-career graduate education is undertaken.
- Many designers find their way into municipal, provincial, and national government agencies where design advocacy is extremely important, especially since the dissolution of Design Canada in the mid-1980s. Evidence of design champions can be seen in the initiatives to that resulted in DESIGN MATTERS: the study conducted by the Design Industry Advisory Committee (DIAC) of the City of Toronto's Economic Development Corporation (TEDCO) in 2004 and the report Shaping Canada's Future BY DESIGN published by Human Resources Development Canada (HRDC). (see section A.2.1.)
- An increasing number will go on to complete a PhD. This is a path that is becoming progressively more attractive for those who choose to teach design at a university. Since 1998 the PhD-Design List has provided an international forum for discussion of the issues related to PhD's in design. Through postings it can be seen that the competitive market for PhDs who also have hands-on design experience has grown rapidly in recent years and is expected to continue. Job applicants for positions at Carleton often lack graduate degrees, thus making them ineligible for teaching positions in spite of their excellent design skills. In Canada, the newly established Canadian Design Research Network (CDRN), one of the Networks of Centres of Excellence, has identified the need and taken on the mission to increase the number of highly qualified people (HQP) in the field of design. (see section A.2.1.)
- A few return to or begin a career in design education at the secondary or university level. This is a need expressed by high school teachers who attend teachers' conferences at Carleton and it is a minimal requirement for university-level professors.

Appendix I: Undergraduate Major Project Supervisions			
Year	**Project Title**	**Student Last Name**	**Student First Name**
Category 1			
Burns, Brian			
2000-01	Emergency Medical Injector	Clerk	Jason
2000-01	Pedal Driven Watercraft for Fitness & Recreation	Conroy	Sean
2000-01	Mobile Interactive Work Center for Patients and Staff in Healthcare Environments	Mulligan	Ryan
2000-01	Lightweight Urban Electric Vehicle	Thao	Fusu
2000-01	Task-Responsive Workstation System	Tsui	Denis
2001-02	O Train and the Development of Light Rail: Payment and Security System	Busschaert	Jason
2001-02	Light Rail Seating and Seating Layout	Charlebois	Paul
2001-02	Development of the O Train: Enhancing the Passenger Experience	Hamilton	Jennie
2001-02	The Design Process of the Future of Light Rail Station System	Luo	Zhan
2001-02	The Future of the O Train: Adaptable Retail Furniture for Transit Stations	McMaster	Kerry
2002-03	Vesta: Free Standing Cooking Station that Promotes Social Interaction	Badovinac	Jano
2002-03	Domestic Refrigerator	Brighton	Neil
2002-03	Sustainable Design: Supported Standing Device for Disabled Children	Bryson	Greg
2002-03	Sustainable Design: Class III Emergency/Rescue Harness for Fire Fighters	Buchanan	Ben
2002-03	Sustainable Design: Airport Lounge Seating	Hillman	Tom
2002-03	Sustainable Design: High-Performance Domestic Clothes Washer	Naegelkraemer	Marcel
2002-03	DUO-A Domestic Clothes Dryer	Smith	Andrew
Frankel, Lois			
2001-02	A Suite of Networked Vital Sign Monitors	David	Green
2001-02	Networked MDPad for Physicians	Fung	Ian
2001-02	Networked Medical Devices: Nurses Station	Morris	Quintin
2001-02	Networked Paramedic Patching Device	Saunders	Mark
2001-02	Networked Medical Devices: Patient Information Manager	Woodcock	Katrika
2002-03	Electronic Shower Faucet	Boutin	Louise C.
2002-03	Medical Delivery Assistant for the Frail Elderly	Campbell	Jennifer
2002-03	Bath Transfer Seat for Elderly to do Exercises	Jobst	Amy

Appendix I: Undergraduate Major Project Supervisions			
Year	Project Title	Student Last Name	Student First Name
2002-03	Early Stage Alzheimers Self-Reminder	Rodrigues	Clarissa
2003-04	Physiogames: Exercise for the Young Elderly	Abernethy	Jane
2003-04	Fisio- Lifestyle Toy for Inactive Youth	Beaulieu	Serge
2003-04	Biometric Sensing for Stress Management	DiCesare	Rita
2003-04	2-way Personal Response System	Simpson	Dawn
2004-05	Nuture: Personal Pregnancy Health Monitoring System	Boyachok	Katherine
2004-05	Surpass: The Design of a Wearable Product System for Women	Cheng	Vivian
2004-05	Pediatric Asthma Managing System	Gervais	Stephen
2004-05	Sugarwear: A Wearable Companion for Child Diabetics	Magee	Laura
2004-05	High Risk Infant Monitor	Waggott	Laura
2005-06	Stovetop Cooking Awareness System For Elderly	Beland	Robert
2005-06	A Multi Position Supportive Device for Kitchen Activities	Black	Stacey
2005-06	Modular Shoulder Bag for the Visually Impaired	Carriere	Charles
2005-06	Sound Wave Audio Instruction Workout Mat For The Visually Impaired	Edwards	Christopher
2005-06	Connexions: An Exercise in Spatial Concepts, Orientation, and Communications	Ben-Ari	Ilana
2005-06	iCook Personal Electronic Cookbook for Seniors	Kim	Sunmee
2005-06	Auditory Companion Navigation Aid For Visually Impaired Adults	Mitchell	Elizabeth
2005-06	I Garbot, Electronic Garbage Can For The Elderly	Tong	Amy
2005-06	Mr. Pobobot A Dietary Companion For Seniors	Yip	Kevin
Garvey, Thomas			
2000-01	Minimal Living Environment: Home Health Monitoring Unit	Chung	Son
2000-01	Minimal Living Environment: Small-scale Kitchen	Damar	Cynthia
2000-01	Minimal Living Environment: Controlled Sleeping Environment	Jouppi	Luke
2000-01	Minimal Living Environment: Haptic Communication Device	Kuchinsky	Richard
2000-01	Minimal Living Environment: Personal Storage System	Leung	Arthhur
2000-01	Minimal Living Environment: Communication Aid for the Visually Impaired	Thompson	Sean
2000-01	Minimal Living Environment: Small-scale Bathroom	Wei	Lily
2001-02	Bicycle Paramedic Equipment: Identification/Warning Vest	Booth	Shane

Appendix I: Undergraduate Major Project Supervisions			
Year	Project Title	Student Last Name	Student First Name
2001-02	Bicycle Paramedic Equipment: Bicycle Support Stand	Czaban	Stef
2001-02	Bicycle Paramedic Equipment: Equipment Storage Rack and Bags	Tsai	Stella
2001-02	Bicycle Paramedic Equipment: Hands-free Integrated Communication Device	Xu	Rex
2002-03	Tactical EMS Equipment: Victim Evacuation Support Device	Blackburn	Robert
2002-03	Rooftop Community: Children's Play Structure	Cleland	Kim
2002-03	Rooftop Community: Modular Furniture System for Semi-private Use	McDonald	Alexandra
2002-03	Tactical EMS Equipment: Rapid Response Storage System	Menard	Matthew
2002-03	Tactical EMS Equipment: Protective Vest and Worn Storage System	Parmar	Ilesh
2002-03	Rooftop Community: System lighting	Trudel	Chantal
2003-04	Paramedic Team Leader (PTL) Equipment Transport Device	Antoszkiewicz	Marta
2003-04	Marine Paramedic Bag	Ellis	Shane
2003-04	Stretcher Defibrillator Mount System	Graham	Romeo
2003-04	Paramedic Team Leader (PTL) Reduced Equipment Pack	Lee	Ryan
2003-04	Planetary Pressurized Rover: Hygiene Maintenance Facility	Looker	Adam
2003-04	Planetary Pressurized Rover: Sleep/rest Facility	Naparat	Matt
2003-04	Planetary Pressurized Rover: Sample Collection System	Simmons	Mark
2004-05	Space Tourism: Microgravity Recreation Zone	Brunet	Philippe
2004-05	Space Tourism: Adaptable Personal Privacy Compartment	Gratton	Vincent
2004-05	Wildfire Suppression Equipment: Water Pump Deployment System	LeRoy	Jonathan
2004-05	Wildfire Suppression Equipment: Chain Saw Deployment System	Lukas	Ryan
2004-05	Wildfire Suppression Equipment: Hose Pack Deployment System	Pell	Gabrielle
2004-05	Space Tourism: Earth and Space Interactive Learning Centre	Thompson	Michelle
Hallgrimsson, Bjarki			
2003-04	Backcountry Snowboarding Snowshoes	Brown	Terry
2003-04	Kite-powered Winter Buggy	Ferrarin	Matthew
2003-04	Backcountry Ski Helmet	Hunt	Geoffrey
2003-04	First Response Avalanche Safety Pack	Moffat	Todd
2003-04	Walking Cane for the Elderly	Sianchuk	Nicholas

Appendix I: Undergraduate Major Project Supervisions			
Year	Project Title	Student Last Name	Student First Name
2003-04	Yukigassen' Entry Level Helmet	Vang	Xue
2004-05	Aquatic Learning System for Children	Bianca	Leigh
2004-05	Daily Interactive Relaxation Experience Using Water	Javor	Lauren
2004-05	Teaching Aid for Kindergarten Social Skills	Stonehouse	Kara
2005-06	MAPPA Multi-Sensory Exploring Device For The Child Cartographer	Di Bacco	Barbara
2005-06	Easy Flower	Drupsteen	Jenna
2005-06	Rev-I-ver Interactive Blood Pressure Monitor With Adjustable Cuff System	Eav	Samnang
2005-06	Interactive Postal Kiosk	Ling	Pollyanna
2005-06	NAV The All Access Mountain Pass	Segsworth	Lindsey
2005-06	Interactive System For Furnishing Retail Environment	Yovcheva	Kristina

Appendix II: Library Resources

CARLETON UNIVERSITY LIBRARY

MEMORANDUM

Date: October 25, 2006

To: Lois Frankel
            Director, School of Industrial Design

From: Kristof Avramsson, Science Reference Librarian
            Laurie Campbell, Gifts and Collections Librarian

RE: O.C.G.S Library Support Statement for proposed Master of Interdisciplinary Design
            Development

Carleton University Library's collection and services strongly support graduate teaching and research relevant to the Masters of Interdisciplinary Design Development program. While primary support for the program comes from the Library's collection in design, architecture and engineering, the program also receives support from the social science, humanities, and business collections.

Research Assistance:
The Science Reference Librarian is responsible for the Industrial Design profile and maintains liaison between the Library and the School of Industrial Design, ensuring that the collection reflects changes in research interests and teaching programs. He also compiles specialized research guides of print and online resources, teaches research seminars and provides research assistance to students and faculty. Research support is provided in person, via email, on the telephone, at the Learning Commons Research Help Desk, or using Instant Messenger ('virtual chat'). The Science Reference Librarian also actively encourages students and faculty to assist with collection development by asking for monograph and journal purchase recommendations.

The Library provides expertise in information gathering and quality control by reviewing materials (e.g. books, reports, conference proceedings, journals, web products) for their academic level and relevance to their program areas. The Library's Website (http://www.library.carleton.ca) provides links to resources such as the Library Catalogue, other library catalogues, databases, e-journals, e-books, and virtual reference tools.

Access to Campus Resources:
Carleton University Library's online products are available from more than 190 workstations in the Library's Learning Commons and in computer labs and offices across campus. Twenty-four hour access is available from off-campus via the Library's proxy server. Wireless access is available throughout the Library and in select buildings on campus.

Carleton's integrated library system (Millennium from Innovative) provides a user-friendly web-based online public access catalogue, which allows for focused sophisticated search techniques and the ability to search multiple library catalogues at one time. The Library web site provides links to journal indexes, articles, and full-text electronic resources.

The Joy MacLaren Adaptive Technology Centre, located on the main floor of the Library, is equipped with adaptive equipment for use by students with disabilities who are registered with the

Paul Menton Centre. Wheelchair-accessible library catalogue terminals, equipped with large monitors, are available throughout the Library.

Acquisitions:

Funding:
The Library spent $5,154,476.32 on Library resources in 2005/06. In 2006/2007, the Library's material budget is $4,735,655 (not including any year-end contingency funding). This funding, together with the strong Canadian dollar, has enabled the Library to add many important reference and full-text resources to support the University's teaching and research.

Statistics on the Library's spending by subject for the last seven years are not available. Spending on multidisciplinary reference resources and online journal collections are not tracked by specific subject budgets.

Serials:
Carleton University Library has made the transition from print to electronic journals. The Library currently has access to over 36,000 electronic full-text journals in all areas of humanities, social science, science and technology.

The Library has developed a very strong electronic journal collection through participation in two consortia: Canadian Research Knowledge Network (CRKN) and the Ontario Council of University Libraries (OCUL). Core collections for Industrial Design include:

- Academic Press IDEAL
- Blackwell Synergy Journals Online
- Cambridge Journals Online
- Elsevier's Science
- Project Muse
- PsycArticles
- SpringerLINK (including Kluwer)
- Taylor & Francis (including Dekker)
- Wiley InterScience

For a description of these online journal collections, please see **Appendix A**.

The Library's electronic online journal packages are available through Scholars Portal Search, an OCUL initiative, providing a common interface for searching across journals and indexes published by major distributors and presses.

Monographs:
Scholarly materials relevant to the graduate programs are received through the approval plan program, individual orders, serial subscriptions, standing orders, memberships, and consortial purchases. Titles collected for Industrial Design are mostly published in the United States, Canada, the Netherlands, Great Britain, and Scandinavia. As well as selecting from the standard commercial publishers, the Library also makes every effort to collect university press publications, research reports, bulletins, special papers, lecture notes, and conference proceedings. For a statistical breakdown of the Library's holdings, please see **Appendix B**.

E-Books:
Carleton University faculty and students have access to over 7,000 electronic books in the netLibrary database. E-books can be accessed through the library catalogue.

Reference Collection:
The Library maintains a reference collection of indexes, abstracts, literature guides, bibliographies, dictionaries, and encyclopedias in electronic and print format. These include the following:

- ACM Digital Library (Association for Computing Machinery)
- Applied Science and Technology Full Text
- ARTBibliographies Modern
- Art Index Full Text & Art Index Retrospective
- Avery Index to Architectural Periodicals
- BioMed Central
- Business Source Premier
- CBCA Business & Reference
- Computing reviews
- DAAI: Design and Applied Arts Index
- EiCompendex Web
- Embase/Medline
- Ergonomic Abstracts
- IEEE Xplore
- INSPEC Axiom and INSPEC Archive
- Journal Citations Reports
- PsycInfo
- Social Science Full Text
- Sociological Abstracts
- Web of Science

For a description of these reference databases, please see **Appendix C**.

Theses:
Access to theses is provided by:
- *Digital Dissertations* Full Text (PDDT)
  Contains citations and abstracts to Master's and Ph.D. theses from North American universities. (Full text of theses from all universities from 1997-, and many Carleton theses from 1961- available free to Carleton users)
  Current Research@Carleton,
- *Subset of Digital Dissertations.* Contains citations and abstracts to Carleton University theses, plus the **full-text** of these theses from 1961-.
- *Index to Theses*
  Contains citations and abstracts to theses accepted for higher degrees by the universities of Great Britain and Ireland.

Citation Support:
The Library has acquired **RefWorks**, a Web-based tool to create, format and manage bibliographies and papers.

Maps, Data and Government Information Centre (MADGIC):
An essential resource for Industrial Design students is the Maps, Data and Government Information Centre (MADGIC). Librarians in MADGIC provide seminars to Industrial Design students and assist them in finding demographic and government publications.

Please see **Appendix D** for a description of its collection and services.

Access to External Resources:
Located in the National Capital Region, Carleton has easy access to many valuable research collections in the area. Faculty and students have full access to the holdings of the University of Ottawa either through interlibrary loan or on-site borrowing.

The Sm@rtLibrary project is an Ottawa Centre for Research Innovation (OCRI) Sm@rtCapital initiative which is funded by Industry Canada's Smart Communities Program. It allows library users to search the library catalogues of Carleton University, the Canada Institute for Scientific and Technical Information (CISTI), the National Library of Canada, Ottawa Public Library and the University of Ottawa, individually or simultaneously. Researchers may request items at these libraries by virtue of being a member of Carleton's community. Access to the Sm@rtLibrary is available from the Library's online catalogue.

Carleton University offers interlibrary loan service to faculty, staff and registered students. Materials can normally be obtained in a very short turnaround time, often via fax or ARIEL. The interlibrary loan system RACER allows students and faculty to simultaneously search all of the Ontario University Libraries for books or journals not held at Carleton. Researchers may sign up for RACER and connect to RACER from the Library's web site, either on or off campus.

Journal articles not held at Carleton are also available through the Library's journal articles services, Ingenta and CISTI Source. Together they provide access to journals in all subject areas and to their table of contents. Ingenta and CISTI Source include 26,000 and 18,000 journals respectively. Faculty and students can have unlimited free articles (some restrictions apply) and free Canadian and American PhD dissertations.

With the Special Services Agreement between the National Research Council of Canada and Carleton University, faculty and graduate students have access to CISTI (Canada Institute for Scientific and Technical Information) stacks. For a copy of the Special Services Agreement, please see **Appendix E**.

Carleton students and faculty can borrow material in person from university libraries across Canada. Academic membership in the Canadian Association of Research Libraries (CARL) allows students and faculty to borrow material through Interlibrary Loans from all major libraries, world-wide.

Membership with the Center for Research Libraries, Chicago, permits the Library free access and borrowing of the Center's materials (over 4 million volumes) which include all subject areas.

The Library is committed to collection development and management and resource sharing. The Library, the Science Reference Librarian, and library staff will pursue every means possible to support the new Master of Interdisciplinary Design Development Program.

Attached: Appendix A - Library holdings by LC classification
                 Appendix B - Online full-text journal collections
                 Appendix C - Online reference resources
                 Appendix D - Maps, Data and Government Information Centre Support
                           Statement
                 Appendix E - Special Services Agreement between NRC and Carleton

c.c:
                 Margaret Haines, University Librarian
                 Roger Blockley, Dean Faculty of Graduate Studies and Research
                 Anita Hui, Head, Collection Development
                 Susan Jackson, Head, Maps, Data and Government Information Centre

Appendix A: Online Full-text Journal Collections

Blackwell Synergy Journals Online
Provides access to over 700 full text journals including engineering, computing and technology, life and physical sciences, and medicine.

Cambridge Journals Online
Provides full text for over one hundred journals in the sciences, social sciences, and humanities

Elsevier's Science Direct (including Academic Press)
Provides access to more than 1800 scientific, technical, and medical journals published by Elsevier and Academic Press. Coverage begins with 1995. Subscription also includes back files of journals in Psychology, Social Sciences, Business, Decision Sciences and Computing Sciences beginning with volume one.

Project Muse
Full-text of journal articles from nearly 200 journals in the Humanities and Social Sciences.

PsycArticles
Full text access to 53 journals which include all APA (American Psychological Association) journals and selected EPF (Educational Publishing Foundation) and Canadian Psychological Association journals.

SpringerLINK (including Kluwer)
Provides access to Springer Verlag and Kluwer journals covering disciplines in Science, Technology, Health, Engineering, Environment, Economics and Law.

Taylor & Francis (including Dekker)
Provides access to online journals in science and information technology, including all Dekker journals.

Wiley InterScience
Provides access to over 300 journals published by Wiley. Subjects covered include: business, finance and management, chemistry, computer science, earth science, engineering, law, life and medical sciences, mathematics and statistics, physics and psychology.

Appendix B: Industrial Design, print Library Holdings

Subject	Total	Monographs	Serials	Current Serials
Anthropology and Ethnology, General	5,438	5,321	117	41
Social Sciences, General	2,086	1,965	121	34
Public Policy; Policy Sciences	204	202	2	2
Economic Production, Management	6,966	6,873	93	36
Industrial Organization & Market Structure	4,676	4,631	45	21
Production Engineering	821	812	9	5
Business, Business Administration	7,062	6,863	199	83
Financial Management	557	540	17	8
Sociology, General	6,453	6,325	128	46
Architectural Drawing. Technique	32	32	0	0
Exhibition Buildings	11	11	0	0
Drawing Technique	50	50	0	0
Commercial Art, Advertising Art	130	109	21	9
Decoration and Ornament. Design	25	23	2	2
History of Design up to the end of 19th Century	35	34	1	0
20th Century Design	51	51	0	0
Special Countries and Design	105	103	2	1
Theory of Design, General Works, Collections	109	109	0	0
History and Styles of Interior Decoration	9	9	0	0
20th Century Interior Decoration	8	8	0	0
Interior decoration of countries	9	9	0	0
Interior Design by country	25	25	0	0
Furniture-General	14	14	0	0
Furniture History to the end of 19th Century	18	18	0	0
20th Century Furniture	11	11	0	0
Special Countries, Special Designers, Special	153	152	1	1
Research- Management	168	145	23	11
Human Computer Interaction	263	225	38	8
Mechanical Drawing. Engineering Graphics	362	347	15	3
Exhibitions, Trade Shows; General, Display Techniques	24	24	0	0
Human Engineering	127	113	14	1
Drawings and Designs	306	293	13	4
Materials of Engineering and Construction	2,373	2,297	76	18
Production Management (includes Industrial Design, Product Design	1,077	1,054	23	6
Packaging	24	20	4	2
Wood Products and Furniture	20	19	1	1
Totals	**39,802**	**38,837**	**965**	**343**

Appendix C: Online Reference Resources

ACM Digital Library (Association for Computing Machinery)
Bibliographic information, abstracts, reviews, and full-text articles published in ACM periodicals and proceedings since its founding in 1947 are available together with selected works published by affiliated organizations.

Applied Science and Technology Full Text
This database contains full-text of more than 90 periodicals dating from 1997 with comprehensive indexing of nearly 400 core scientific and technical publications dating from 1983, with abstracts from March 1993. Covers all areas of engineering, technology, and science with coverage of important trade and industrial publications, journals and other specialized subject periodicals.

ARTBibliographies Modern
Contains citations and abstracts to journal articles, books, essays, exhibition catalogs, PhD dissertations, and exhibition reviews. It is a premier source of information on modern and contemporary arts dating back from the late 19th century onwards, and includes photography since its invention. Topics include: performance art and installation works, video art, computer and electronic art, body art, graffiti, artists' books, theatre arts, conservation, crafts, ceramic and glass art, ethnic arts, graphic and museumology design, fashion, and calligraphy, as well as traditional media including illustration, painting, printmaking, sculpture, and drawing.

Art Index Full Text and Art Index Retrospective
The full-text database contains over 400,000 records from some 400 international arts journals and periodicals, yearbooks, and museum bulletins. Coverage includes art design, folk art, industrial design, interior design, museum management, pottery, textiles, and motion pictures, television, and video. The retrospective database is bibliographic only. It cumulates citations to volumes 1-32 (1929-1984) of the printed Art Index. The publications covered focus on advertising art, antiques, archaeology, architecture and architectural history, art history, computers in art, crafts, decorative arts, fashion, folk art, graphic arts, industrial design, interior design, landscape architecture, motion pictures, museum, painting, photography, pottery, sculpture, television, textiles, and video.

Avery Index to Architectural   Periodicals
Indexes more than 2000 periodicals published worldwide on archaeology, city planning, interior design and historic preservation, as well as architecture.

BioMed Central
Provides full-text access to biomedical research publications including biology and medical journal articles, current reports, and meeting abstracts. Provides information about current controlled trials as well as topics in modern biology.

Business Source Premier
Indexes over 3300 scholarly journals and business periodicals (over 2800 of them Full-text). Topics include: management, economics, banking & finance, accounting, international business, labour relations, computer systems, marketing, area studies, taxation, industry & manufacturing, production & operations management, communications & media, human resources, public administration, health care management etc.

CBCA Business & Reference:
CBCA Business covers over 400 journals, magazines, newspapers, and newsletters. This collection provides in depth access to a broad range of Canadian business periodicals. Trade journals, general business publications, academic journals, topical journals, and professional publications are all included. CBCA Reference covers journals, magazines and newsletters. This collection provides in depth access to a wide diversity of Canadian periodicals, ranging from

academic titles to special interest publications to general magazines. The academic titles include prominent journals from the humanities, social sciences, sciences, and professions.

Computing Reviews:
Reviews of computer science books, journal articles, and conference proceedings. Provides updated information regarding new material in the Computer Science field. Some reviews have links directly to the full text of the items being reviewed.

DAAI: Design and Applied Arts Index
Indexes over 500 core design and craft journals. Also includes information on over 50,000 designers, craftspeople, studios, workshops and commercial firms.
Embase/Medline
Provides full access to both Embase and Medline databases (including Pre-Medline literature).

Ergonomic Abstracts
Provides citations and abstracts to articles from over 350 journals, as well as books, reports and conference proceedings. Topics include not only mainstream ergonomics but also related material from psychology, physiology, biomechanics, job design, human-computer interaction, safety science, human engineering, medicine, occupational health, sport and transport.
Ei Compendex Web
Contains citations to journal articles in all areas of engineering. It covers civil, environmental, mechanical, aerospace, nuclear, chemical, electrical, biological, and geological engineering.

IEEE Xplore
Provides IEEE and IEE transactions, full-text journals, magazines and conference proceedings published since 1988, as well as all current IEEE standards.

INSPEC Axiom and INSPEC Archive
The world's largest bibliographic database in the field of physics, electrical engineering and electronics, computers and control engineering and information technology.   Includes the INSPEC archive, which provides access to over 873,000 records spanning   the years 1896 through 1968. When combined with the INSPEC database, researchers are provided seamless access to over 9 million records covering more than 100 years with 400,000 records added annually.

Journal Citation Reports:
Journal Citation Reports is a comprehensive and unique resource for journal evaluation, using citation data drawn from over 8,400 scholarly and technical journals worldwide. The Science Edition contains data from 5,000+ journals in the areas of science and technology. The Social Sciences Edition contains data from roughly 1,500 journals in the social sciences.

PsycInfo
Provides citations with abstracts to journal articles, books, and book chapters and dissertations in all areas of psychology and the behavioural sciences.

Social Sciences Full Text
Provides citations to journal articles and **full-text** to selected journal articles in all areas of social sciences

Sociological Abstracts
Provides citations with abstracts to journal articles, books, book reviews, and conference papers on sociology and social planning and policy.

Web of Science
Consists of the 3 main citation databases: Science Citation Index, Social Sciences Citation Index, and Arts & Humanities Citation Index. Carleton has acquired back files from 1945 onwards.

Appendix D: Maps, Data and Government Information Centre support statement for proposed graduate program in Industrial Design

The holdings of the Maps, Data and Government Information Centre (MADGIC) are extensive for both Canadian and international areas of research. These collections comprise more than 1.3 million official publications items in print, microform and electronic media as well as cartographic material (sheet maps, atlases, air photos, transparencies, microforms and geospatial data) and several thousand data files of statistical microdata and survey data. The collection covers both current and retrospective issues, with particular emphasis on those from the post-World War II era.

Staff members with expertise in working with the research materials in MADGIC offer specialized reference service 64 hours per week through a separate information desk and by email or appointment. Data Centre and GIS specialists also offer expert assistance to those working with digital data files. Class seminars and data sets tailored to course content can be provided upon request from course instructors. Official publications are listed in the library's online catalogue. Internet access to the enormous body of digital government information is facilitated through the provision of web links in the online catalogue and via the subject and course guides on the Library web site and from the MADGIC web pages at http://www.library.carleton.ca/madgic/. Staff members ensure that relevant Internet sites are identified and linked from the web pages, and course-specific links are created to ensure effective use of web resources.

Although not a primary collection for the study of industrial design, the resources in MADGIC provide a very strong supporting collection. Given the interdisciplinary nature of the proposed program, relevant material includes reports and data about market trends and marketing, public opinion, general economic and social conditions, detailed census data, general statistical data, and policy documents that include information about law and regulations; these will all be of considerable interest to those who need to develop close knowledge of the marketplace and the design environment.

Canadian government information is collected with great breadth of subject coverage. Within this collection are reports that deal with ageing populations, health care needs, disability and accessibility needs, environmental concerns such as green industry, recycling and packaging, support for technological innovation, and competition policy. Public agencies such as Canada Mortgage and Housing Corporation support research into improving the built and home environment. The federal and provincial ministries of environment support programs to improve environmental controls and new environmental technologies.

The Microlog microfiche collection includes many reports of this nature which are indexed in the online Canadian Research Index. The Canadian Intellectual Property Office provides support and regulation for trade marks and patents and is home to the Industrial Designs portal at http://strategis.ic.gc.ca/sc_mrksv/cipo/id/id_main-e.html?icservices+e_ind including guidelines and procedures manuals.

Provincial governments have also been fairly active in developing ergonomic standards for the workplace. Legislative bodies, federal and provincial, have held hearings, and enacted legislation and supporting regulations to protect intellectual property and to encourage industrial innovation.

Within the very large collection of publications from intergovernmental-international organizations can be found reports relating to labour standards, industrial development, competition policy, import-export regulations, environmental protection as well as statistics on a wide array of

themes. Some of the major organizations of possible interest are the World Trade Organization, the United Nations Environment Programme, the United Nations Industrial Development Organization, the International Labour Organization, and the Organization for Economic Co-operation and Development. Of particular interest is desktop access to SourceOECD, the online collection of OECD statistics, periodicals and monographs to which the library subscribes. There is also a strong American documents collection that is augmented by the vast amount of information made available on the Web by the U.S. government, including congressional, agency and regulatory documents.

Canadian public opinion data is available through the Data Centre's collection of Gallup and Pollara polls while European opinions on a wide range of themes can be found in the Eurobarometer series of polls. Many other statistical surveys held by the Data Centre, in particular those from Statistics Canada, provide detailed data about how Canadians live. The Data Centre web site at http://www.library.carleton.ca/ssdata/surveys/subject.html lists the wide variety of data resources that can be used to develop background information about potential products and their use.

Susan Jackson
Rev. October 25, 2006

Appendix E: Special Services Agreement between NRC and Carleton

The statement will be mailed.

Appendix III: Courses for Elective Requirement		
ANTH	5403	The Anthropology of Signs and Symbols
ARCC	5000	Dir Studies: History & Theory
ARCC	5001	Intro to Design & Multimedia
ARCC	5401	Wkshp: Tech Studies in Heritage
ARCC	5002	Topics in Design & Multimedia
ARCH	5000	Directed Studies
ARCH	5100	Directed Studies
ARCH	5003	Design and Culture Workshop
ARCH	5001	Architecture Seminar I
ARCH	5002	Architecture Seminar II
ARCN	5000	Directed Studies
ARCN	5001	Directed Studies
ARCN	5101	Interactive Design Wkshp I
ARCN	5102	Interactive Design Wkshp II
ARCU	5000	Directed Studies
ARCU	5402	Wkshp: Urban Stud Heritage Con
BIOM	5001	Engineering Analysis and Modeling of Human Anatomy and Physiology
BIOM	5002	Ethics, Research Methods and Standards for Biomedical Engineering
BUSI	5200	Seminar in Marketing
IDES	5000	Directed Studies in Industrial Design
IDES	5301	Creative Problem Solving in Design
PSYC	6105	Psychological Aspects of Computer Use
PSYC	6106	Social Aspects of Computer Use
PSYC	5010	Social Psychology Methodology
PSYC	5012	Organizational Psychology I
PSYC	5105	Fundamentals of Computing for Psychologists
PSYC	5106	Computers and Cognition
SOCI	5209	Sociology of Science and Technology
SYSC	5300	Health Care Engineering

Appendix III: Courses for Elective Requirement		
SYSC	5302	Principles and Design of Advanced Biomedical Instrumentation
SYSC	4105	Engineering Management
TTMG	5005	Mgmt of Telecomm Sys Design
TTMG	5101	Integrated Product Development
TTMG	5003	Issues in Telecommunications
TTMG	5001	Management Principles for Engineers
TTMG	5002	Telecommunications Technology