

Program Proposal
for
Master of / Magisteriate in
Supply Chain Management

Department of Supply Chain and Business Technology Management
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Executive Summary

The proposed program will be called *Master of / Magisteriate in Supply Chain Management (SCM)*, to be offered at the graduate level. SCM is envisaged as an interdisciplinary, integrated approach to the management of material, information and cash flows along supply chains, involving the disciplines of supply chain operations management (SCOM), marketing, finance, management, information technology management, business intelligence and industrial engineering. Of these disciplines, SCOM will carry a heavier weight in the program in terms of seminar contents.

The program will overall aim at: *exposing the students to the interdisciplinary nature of the SCM field using an applied research platform*. Tools, techniques and approaches in this regard are to be covered throughout the program with the ultimate objective of: *educating and challenging the students to be critical thinkers, problem identifiers and problem solvers in SCM using scientific approaches, where the solutions proposed bear both academic and business merit*.

The proposed program will be a 45-credit program, involving five seminars (15 credits) devoted to SCM, two core seminars common to other MSc programs at JMSB (6 credits), three graduate seminars (9 credits) from a list of eight elective seminars at JMSB and an industry based applied research project (15 credits). The program duration will be 16-months for a full time student. Students will be required to fulfill the same admission requirements applicable to MSc admissions at JMSB. Those students with non-SCM and non-industrial engineering undergraduate degrees will be required to complete a maximum of three courses prior to joining the program. The students will be guided throughout the program by an academic advisor.

The 15-credit applied research project is conceived to be the major contact platform with industry and business. Initial discussions with the industry partner and contract preparation will be conducted by the project coordinator, who will also act as the administrative liaison between the company and the program. Academic supervision of each project will be conducted by a faculty member. Co-supervision by faculty members from other JMSB and ENCS departments will be particularly encouraged.

The expenditure – revenue calculations are done based on admissions of 10 students per academic year for the first two years and 14 students per academic year for the last three years. A loss of \$10,452 is expected for the first academic year of operations. However, offset by the surpluses for the next four years, the program is expected to have a net total surplus of \$226,209 at the end of the five year period.

In terms of human resource implications, a project coordinator will be hired at the beginning of the program. A tenure track faculty member in SCM will be hired at the beginning of year three, if the program continues to be viable by then in terms of student registrations. There will be five new courses in terms of additional teaching requirements. Current classroom, computer laboratory and library facilities are deemed to be adequate.

When successfully launched, the program will fulfill the current degree gap between the undergraduate SCOM and the joint PhD in Administration programs. The program will also significantly foster the much needed collaboration between the Department and the industry, providing an applied and an interdisciplinary platform for faculty members not only at the Department, but also at other JMSB and ENCS departments in terms of co-teaching and co-supervision.

Preface: Brief Conceptual Underpinnings

Globalization and advances in information technologies led to an extensive array of new business perspectives and applications. Globalization resulted in conducting business across boundaries and geographies. On the other hand, advances in information and web based technologies facilitated the coordination and hence the close integration of various stakeholders along the supply chain. Among such stakeholders are: the focal company and its multi-tier suppliers, business partners, outsourced companies, subcontractors, intermediary and final customers. A fundamental shift in management has occurred over the last two decades from managing a 'unit environment' to managing a 'chain environment'. This shift in focus continues to have first degree implications in product / process design, customer relationship management, supplier relationship management, logistics and information flow / decision making.

The discipline of operations management traditionally focused on how to best allocate the scarce resources of labor, machinery, material, money, information and time for a given focal company. Both quantitative and qualitative tools / techniques / approaches are utilized in this respect. The shift from a 'unit' to a 'chain' environment, however, has put the teaching and research emphasis boldly on *integration* of stakeholders' operations along the supply chain. The once famous quote from an ex-CEO of IBM "What we are shipping out is not a computer, but our *organization*" is now perceived as being too focal company focused and as such, rather restrictive. Today's prevailing mindset within leading edge companies is more along the lines of "What we are shipping out is not a physical product or a service, but our *supply chain*", hence the acute need for managing properly the flow of material, information and money along the supply chain. This latter perspective is how we conceive Supply Chain Management (SCM) throughout the graduate program proposal that follows. Such a conceptualization differs from the widely practised (largely in business and, to a certain extent, in academia as well) logistics based perspective of SCM, that mostly focuses on managing the material flow.

As *integration* of stakeholders is becoming a powerful paradigm for a successful SCM, *interdisciplinary approach* to SCM is expected to be an effective means in operationalizing this emerging paradigm. In a pull-system, the ultimate pull comes from the downstream marketplace. Hence, demand management plays a crucial role in SCM, providing an opportunity to collaborate with the discipline of *marketing*. Making scarce resource allocation decisions and re-engineering processes within the focal company and along the supply chain involve the use of *operations management*, *industrial engineering* and *statistics* tools / techniques. Managing supply chain risks requires the contribution of various business and engineering disciplines, in particular the discipline of *finance*. Transferring the mindset of any supply chain stakeholder from a 'unit' to a 'chain' environment would make use of *change management* strategies, including *stakeholder management*. All of the above *economic sustainability* based learning has to be complemented with tools / techniques in *environmental sustainability* and *social sustainability*. On the other hand, *Information systems* would provide the structure for a smooth flow of information along the supply chain.

Hence, the proposed graduate program 'Master of / Magisteriate in Supply Chain Management' aims to provide an interdisciplinary approach to SCM. As such, it is a program that is conducive to collaboration among various disciplines in terms of teaching and applied research project supervision.

Section 1. Program Identification

1.1 Program title, degree title and level

The program (program) will be called *Master of / Magisteriate in Supply Chain Management*, to be offered at the graduate level.

1.2 Areas of specialization

The area of specialization will be 'Supply Chain Management (SCM)'. SCM is envisaged as an interdisciplinary, integrated approach to the management of material, information and cash flows along supply chains, involving the disciplines of supply chain operations management, marketing, finance, management, information technology management, business intelligence and industrial engineering. Of these disciplines, the 'supply chain operations management' will carry a heavier weight in terms of seminar contents.

1.3 Administrative location

The new program will be housed in the Department of Supply Chain and Business Technology Management at the John Molson School of Business, Concordia University.

Section 2. Program Objectives

2.1 General academic aim

The program will overall aim at: *exposing the students to the interdisciplinary nature of the SCM field using an applied research platform*. Tools, techniques and approaches in this regard are to be covered throughout the program with the ultimate objective of: *educating and challenging the students to be critical thinkers, problem identifiers and problem solvers in SCM using scientific approaches, where the solutions proposed bear both academic and business merit*.

2.2 Specific knowledge, expertise and skills (learning outcomes) to be acquired by students

Although the course content of the program will be biased towards 'supply chain operations management (SCOM)', the following disciplines and areas will be incorporated (where feasible) in various course contents to make the final offering a graduate program that is loyal to the integrated spirit of SCM:

- *supply chain operations management*: designing supply networks; global logistics; planning supply and demand; sourcing; contracting; inventory management; coordination; operational risk management
- *marketing*: demand management; pricing; revenue management; customer relationship management; management of distribution channels
- *finance*: financial risk management; cash flow management; financing of supply chains
- *management*: change management; stakeholder management; negotiations
- *international business*: contract law; international trade law
- *business intelligence*: data mining; managing information flow; advance supply chain modules in ERP systems
- *industrial engineering*: technology management in manufacturing and logistics; manufacturing flexibility; product design
- *sustainability*: green supply chains; supply chain ethics

By the end of the program, students will be able to:

- i) understand the integrative, interdisciplinary nature of SCM,
- ii) through critical thinking, analyze and design supply chains using appropriate quantitative and qualitative tools, techniques and approaches; generate solutions to supply chain problems that have academic and business merit,
- iii) develop quantitative modeling skills in managing supply chains and using various software in this respect,
- iv) develop applied research skills.

The extent to which these learning objectives would be achieved in each of the six new SCM courses (including the applied research project) and the two core courses is presented in terms of a curriculum map in Section 4.2.7.

2.3 Assessment of learning outcomes

The realization of the above learning outcomes will be assessed through conventional and non-conventional methods. The former will include examinations, research papers, assignments, group projects, case studies and knowledge dissemination through conference presentations and peer-reviewed publications. The non-conventional assessment would involve live cases and feedback from company partners on the applied research project mentioned in item (iv) above.

Section 3. Rationale for Program Proposal

3.1 Socio-economic relevance

3.1.1 Need analysis and anticipated demand

This Program will address the growing need for a master program in SCM that is interdisciplinary, rather than a program largely focusing on the logistics component of SCM, as is the case in many programs currently offered globally. The program will also be a feeder to the joint PhD Program in Administration, hence not only contributing to (applied) research initiatives within the Department during the course of the program, but also extending such initiatives into the PhD phase. The program will go a long way in serving the faculty members' search for graduate students in conducting (applied) research, as well as fulfilling the promise made to the faculty members, as they were joining the Department, that the launch of a master program is imminent.

The potential sources of students for the proposed program are: i) supply chain operations management (SCOM) majors and minors at JMSB, ii) other majors and minors at JMSB – business technology management, finance, marketing, management and accounting, iii) engineering students at Concordia, iv) other universities (schools) in Montreal – McGill, HEC, Ecole Polytechnique and UQAM and v) international students from business and engineering schools.

The undergraduate SCOM major and minor programs at JMSB were launched in 2006. Since then, the number of students majoring in the field almost tripled compared to the legacy program in 'Operations Management'. For the last five years, the relevant numbers, as obtained from the Office of the Associate Dean for Undergraduate Studies, are as follows:

| | <u>2009</u> | <u>2010</u> | <u>2011</u> | <u>2012</u> | <u>2013</u> <small>as of September 20, 2013</small> |
|--------|-------------|-------------|-------------|-------------|---|
| Majors | 128 | 149 | 160 | 152 | 170 |
| Minors | 54 | 63 | 55 | 45 | 30 |

A survey has been conducted during the month of October 2013 in four SCOM courses (SCOM 363 (n=36), SCOM 372 (n=23), SCOM 374 (n=18) and SCOM 498 (n=14)), one finance course (FINA 412 (n=23)), one international business course (IBUS 471 / FINA 455 (n=30)) and one graduate diploma in business administration course (GDBA 506 (n=21)) The total number of students surveyed in SCOM courses was 91 (constituency (i) above), while 74 students were surveyed in non-SCOM courses (constituency (ii)). The last three constituencies (iii) – (v) were not surveyed.

In each class, a power-point presentation on the new program was made prior to the survey. The presentation, consisting of eight slides, lasted for about 12-15 minutes. Then, the students were asked to respond to the following two questions:

Question 1: Are you planning to enroll in a business related graduate program in the next five years? (If your response is a 'No', do not respond to Question 2.) (a) Yes (b) No (c) Maybe

Question 2: JMSB is planning to offer a 16-month 'Master of Supply Chain Management program with an applied research project component. How interested would you be in applying to this program when it becomes available? (a) Interested (b) Not interested (c) Don't know

The overall findings of the survey are presented below. (The course-by-course detailed findings are provided in Appendix 2.) Of the 91 major and minor SCOM students surveyed, 45.05% are planning to enroll in a master program and show an interest in applying to the proposed master of SCM program (corresponding to (a) & (a) responses to the two survey questions). This figure is 14.86% for the non-SCOM students surveyed. Although the 'Maybe' response to Question 1 has not been taken into consideration, the above percentages are encouraging in highlighting the interest for the new program. The numbers for anticipated student enrollment given in the next paragraph are rather conservative estimates, falling far short of findings for the first two student constituencies surveyed ('JMSB – SCOM' and 'JMSB – non SCOM')

| | SCOM | NON-SCOM | OVERALL |
|---|-------|----------|---------|
| Yes, interested (a & a) | 45.05 | 14.86 | 31.52 |
| Yes, don't know (a & c) | 7.69 | 6.76 | 7.27 |
| No study plan (b) | 6.59 | 24.32 | 14.55 |
| Rest (c & a, c & b, c & c) | 40.66 | 54.05 | 46.67 |

(All figures are percentages of students in their respective samples who responded to question #1 and #2 in the stated combination.)

For the annual student enrollment in the program, it is anticipated that around 8% - 10% of SCOM majors and minors graduating would be willing to join the program. This is equivalent to around 4-5 students of the approximately 50 SCOM major and minor students currently graduating each year. The expectation is that about 2-3 students will be joining from each of the other constituencies (ii- v) above. Hence, an enrollment between 11 – 16 students per academic year is anticipated over the next five years. The lower end of the range is expected for the first two years, whereas the higher end of the range is more likely to materialize in terms of student enrollment for the next three years.

3.1.2 Evolution of training requirements

In North America, in the 1970s and 1980s, the productivity, efficiency and effectiveness issues were largely dealt within a 'unit' environment, that is the company in question was the focal point itself. As of early 1990s, with the advance of both globalization and use of web-based communication and information technologies, the 'unit' environment was replaced by the 'chain' environment, where multi-stakeholders

(the focal company, first and further tier suppliers, outsourced companies, business partners, intermediate customers and final customers) had become the domain of design and analysis. In line with these developments, the Department launched in 2006 a new major and minor undergraduate program in 'Supply Chain Operations Management', replacing the legacy 'Operations Management' program. The proposed program will be a natural extension of the undergraduate program, hence bridging the current gap between the undergraduate and PhD programs in the area.

Supply chain continues to be one of the fastest growing sectors in North America. Reports show that three quarters of a million Canadians work in various supply chain roles ranging from sourcing raw materials, manufacturing goods, warehousing and distribution of products, to providing after-sales services for private companies, governments, charities and other organizations. Despite all these, more than 27,000 supply chain positions in Canada remain unfilled and another 66,000 openings are anticipated each year for the next five years (<http://www.careersinsupplychain.ca>)

3.1.3 Main employment prospects for graduates

First and foremost, the theoretical and practical knowledge to be acquired during the program would motivate and prepare those students with academic inspirations for an entry into a PhD program. For those graduates who want to join the business world, the career opportunities are varied and vast. The following positions in manufacturing (such as, aerospace, automotive, forest products, pharmaceutical and consumer durables industries) or in service (such as, retail, health care, logistics sectors) are just some of the examples for the Program's graduates to join: supply chain business analyst; supply chain business development analyst (manager); supply chain planning analyst (manager); supply chain risk analyst (manager); supply chain coordinator; sourcing manager; procurement manager; inventory analyst (manager); distribution coordinator; transportation route and crew scheduler; logistics manager; warehouse manager. Opportunities also exist for joining SCM consulting companies, both as a junior consultant in the field or as a systems analyst in developing advanced supply chain planning and control models.

3.1.4 Importance to professional orders, private, public or government organizations

As the potential job opportunities argued in previous section indicate, the SCM field has a significant impact in the private sector, both in manufacturing and services. Its impact on public and government organizations is more limited. Nevertheless, applications of SCM in health care, transportation and port operations are important examples in public and government sectors. In terms of professional orders, Supply Chain & Logistics Association of Canada, PMAC (Purchasing Management Association of Canada), Institute of Industrial Engineers, Institute for Operations Research and the Management Sciences, Production and Operations Management Society and Council of Supply Chain Professionals are some of the professional institutions in North America that the graduates can join.

3.1.5 Compliance with Quebec's legislative and regulatory framework

This section is not applicable to the proposed program.

3.1.6 Similar programs in Canada (excluding Quebec) and elsewhere

Similar local programs in Montreal are presented in Section 3.2.1. In this section, similar programs in Canada are highlighted. Such programs are either at master level or given as a specialization in MBA programs or offered as a certificate. University of British Columbia offers an MSc in Business Administration, Transportation and Logistics; Ryerson University offers an MSc in SCM (as a specialization); whereas Wilfrid Laurier University has a master program in SCM; and the University of Windsor offers master of Management – Logistics and Supply Chain Management. As to SCM specialization as part of an MBA program, University of British Columbia and McMaster University offer such an option. At the certificate level, York University and Simon Fraser University offer SCM certificate programs through their continuing

education units. There are well over 200 such degree (MSc, masters, MBA) and certificate programs globally. Descriptions and calendar excerpts of related programs in Quebec and Canada are presented in Appendix 1.

The proposed master program will differentiate itself from other SCM / Logistics programs in Canada and in the world in terms of its interdisciplinary, integrated nature, as argued in Section 2.2. It is this very feature that will distinguish it from other programs which are (to a large extent with few possible exceptions) rather logistics (warehousing, transportation and distribution) oriented. (Although misleading, it is quite common to find the phrase ‘supply chain management’ used as a synonym for ‘logistics’ in academia and business.)

3.2 Systemic relevance

3.2.1 Similar local programs

MSc degree programs in Montreal

HEC offers similar in name but different in content programs. HEC has two MSc programs (each about 16 months long) – one in ‘Global Supply Chain Management’ (in English; with an average annual enrollment of 15 students, about 10-15% of which are their own graduates) and the other in ‘Logistique Internationale’ (in French; with an average annual enrollment of 20 students, about 50-60% of which are their own graduates). These are 45-credit programs with two streams: i) 21 course credits + 24 thesis credits, or ii) 36 course credits + 9 project credits, both of 18-month duration. While both can be done in French, students who wish to follow English instruction can only choose the thesis option. Both programs have almost identical contents, focusing on transportation and logistics areas, differing largely in the language of instruction.

As argued in Section 3.1.6, the proposed program will differ from the MSc programs in SCM offered by HEC in terms of its interdisciplinary, integrated nature (as opposed to logistics focused programs under the banner of SCM). In terms of program duration, the proposed length of 16 months is slightly lower than the 18-month duration for the programs offered by HEC.

At Concordia, the Faculty of ENCS offers two graduate programs, one in ‘Industrial Engineering’ and the other one in ‘Quality Systems Engineering’. Over the years, both programs had performed well in terms of student enrollment. These two programs offer some guidance as to the proportion of internal undergraduate students in a cohort of a master program. This ratio is around 15% for the MEng Program in Industrial Engineering at the Faculty of ENCS. The same ratio is around 5% for the MSc in Administration at JMSB.

At JMSB, MSc programs are currently offered in Finance, Management and Marketing. The proposed program will differ from these MSc programs at JMSB in terms of: its interdisciplinary nature; applied research orientation; shorter duration; and, higher level of student scholarships (to be secured from business and industry).

Other degree and diploma programs in Quebec

Similar programs have been offered at a number of Quebec universities with different program durations, instructional languages, contents and targeting levels.

Laval University is also offering an MSc program in 'Operations and Decision Systems' with 21 course credits + 24 thesis credits. The program is in French only. Some other graduate (non-master) SCM programs also exist in Quebec. Laval University has an MBA program in 'Gestion Manufacturiere et Logistique'. It is also collaborating with EPFL in Switzerland and ENPC in France on a private Executive Masters Program in SCM. The School of Continuing Studies at McGill University offers Graduate Diploma with Supply Chain Management option. It is composed of 30 course credits with no project or thesis component. These programs target at different student profiles, both in terms of program objectives and student backgrounds. The proposed program will be the only English degree program in Quebec with an applied research project component.

3.2.2 Potential Collaborations

Most of the programs discussed above are currently located in the city of Montreal, where university professors have long-established collaboration in both research and teaching. In particular, four universities in Montreal (Concordia, McGill, HEC, and UQAM) have long been engaged in a joint PhD in Administration program, where doctoral students can enroll in classes across the four institutes. Therefore, there are ample opportunities for the proposed program to collaborate with other academic institutions in Montreal as well. SCM faculty members in the Department had collaborated in the past and are currently collaborating in research projects with colleagues at other universities in Montreal and Quebec City. In terms of research project titles, some recent examples for such research collaborations are: 'Study of distribution and logistics strategies for Game Access Inc.', 'Design of supply contracts at SkiRetail, Inc.', 'Modular network design models', 'New algorithms for vehicle loading and routing problems', 'Supplier selection problem: A GA based solution approach'.

One other possibility in collaboration is that the proposed program can partner with parallel programs (e.g., HEC's MSc, MSc in Industrial Engineering at Concordia) in sharing courses, seminars, workshops and placement information. In addition, the proposed program can also serve as an extension for graduates in other programs (e.g., the graduate diploma program at McGill University School of Continuing Studies) who wish to pursue more in-depth study in supply chain management.

3.3 Institutional relevance

3.3.1 Status of the discipline at Concordia

Supply Chain Management is a relatively new discipline emerging from the traditional fields of Production / Operations Management, Logistics and Operations Research. At the undergraduate level, the Department of Supply Chain and Business Technology Management offers majors and minors in SCOM and BTM and a minor in Business Intelligence. The major in SCOM was launched in 2006 and the enrollment is consistently increasing as indicated in Section 3.1.1.

At the graduate level, the Department participates in the joint PhD program in Business Administration, offered by the four universities in Montreal. Currently, the Department does not offer any specialization leading to an MSc (Master) degree. No other department at Concordia University offers specialization in Supply Chain Management at the master level. The Faculty of Engineering and Computer Science (ENCS) offers two graduate programs in Industrial Engineering (MEng and MAsC) and in Quality Systems Engineering (MAsC). Over the years, both programs had performed well in terms of student enrollment. In

terms of course overlap, the proposed program and the ENCS programs have the course 'MSCM 681 Advanced Modeling and Optimization' overlapping with 'INDU 6121 Advanced Operations Research'. No other courses overlap between these programs.

One of the distinguishing features of this program is its interdisciplinary content that will be delivered by integrating materials drawn from supply chain operations management, marketing, finance, management, international business, business intelligence and sustainability. The program intends to provide a broader understanding of the role of supply chain management in organizations and its interactions with various business functions. Whereas the aforementioned programs at ENCS are traditional Industrial Engineering based programs largely based on quantitative modeling, the proposed program differentiates itself in terms of : i) the domain it covers (focal company vs. the supply chain stakeholders), ii) stronger emphasis on managerial issues supported by analytical analysis, and iii) interdisciplinary coverage of subject material. As such, the overlap between the Industrial Engineering programs and the proposed program is limited to one course, as argued above. In terms of research dissertation component, the Industrial Engineering programs at ENCS have either a thesis component (MAsc) or a smaller scope project component (MEng), whereas the proposed program involves an applied research project to be conducted on a real-life supply chain management problem at a company.

3.3.2 Research and publication performance

Concordia University has a good research and publication record in the area of Supply Chain Management / Operations Management. The faculty members of the Department are actively publishing in respected scholarly outlets. Nearly all the faculty members in the SCM area have research projects funded by NSERC, FQRSC, SSHRC and CN.

Figures for graduate student supervision over the last six years are given below. The information provided is not confined to SCM faculty members, but covers all faculty members in the Department since the faculty members in the BTM and Statistics areas are eligible (and encouraged to co-supervise the applied research projects. The external research grants secured from provincial and national granting agencies in the SCM area over the same period is just over \$570,000. The recently established CN Centre for Studies in Sustainable Supply Chain Management is funded by Canadian National for a total of \$500,000 over a five year period. Evidence of scholarly publications, research grants received and graduate student supervision are provided in Section 5.1.1 (short biographies) and in the supporting documents attached to this proposal. Overall figures for graduate student supervision for all faculty members in the department for the period 2008-2013 are given below.

| | JMSB* | | Non JMSB | | Total |
|-----|-----------|---------|-----------|---------|-------|
| | Completed | Ongoing | Completed | Ongoing | |
| PhD | 9 | 5 | 2 | 5 | 21 |
| MSc | 24 | 1 | 4 | 5 | 34 |

*MBA and other non-research based supervisions are not listed.

3.3.3 Collaborations with other departments within Concordia

A good number of Faculty members of the Department collaborate and jointly supervise graduate students at JMSB and the Faculty of ENCS. A number of faculty members are participating in MSc and PhD thesis committees at JMSB and the Faculty of ENCS. Some of the faculty members in the Department had collaborated in the past and are currently working together in research projects with colleagues at other universities in Montreal and Quebec City. Few faculty members in the Department currently have joint research grants with colleagues in other Universities (Laval University, ETS, University of New Brunswick, and McGill University).

3.3.4 Current standing of the Department

The Department of Supply Chain and Business Technology Department at JMSB houses three disciplines: i) supply chain operations management, ii) business technology management, and iii) business statistics. Of the 21 tenured and tenure track faculty members in the Department, each discipline has approximately equal number of faculty members, few of the faculty members being interdisciplinary. The Department also houses the 'Canadian National (CN) Centre for Studies in Sustainable Supply Chain Management'. The Centre was funded by CN for a total of \$500,000 over a five-year period (2012-2017). The purpose of the CN Centre is to establish an effective and mutually beneficial applied teaching and research platform for designing and executing sustainable supply chain management projects. Current and planned projects involve: environmentally responsive supply chain design; risk management for sustainable supply chains; sustainability practices and performance; channel collaboration for green supply chains.

Brief biographies of faculty members in the Department are provided in Section 5.1.1 in terms of the three disciplines housed in the Department.

3.3.5 Alignment with the University's academic plans

The proposed program's interdisciplinary content is unique in Quebec. The Program structure and the course contents are carefully designed to reflect the integrative nature of the field. The Program offers advanced theoretical and applied courses for developing a strong foundation in SCM. The applied research project involving a field study at a company would provide an opportunity for the students and the faculty in getting involved with industry and business on real life SCM problems.

As such, the proposed program will be well aligned with the University's academic plan (2012 – 2016) and its objectives (Objective 1 – Objective 4).

Objective 1 Expand our research strength: The program will go a long way towards meeting the long felt need in providing graduate student support for the Department's faculty members' research work. The applied research project will be an important undertaking in this respect. The students in the program will provide a pool of research assistants for the faculty members.

Objective 2 Promote program quality and innovation: The program is innovative in terms of its interdisciplinary approach to SCM, which makes it unique among similar programs in Quebec.

Objective 3 Build support for student success: Students in the program are anticipated to receive scholarships from the companies where the applied research projects are to be conducted. Another funding source in this respect will be the CN Centre for Studies in Supply Chain Management. The applied nature of the program coupled with such a scholarship structure is thought to provide a competitive advantage for the proposed program over similar programs in Quebec.

Objective 4 Increase experiential learning and community engagement: The applied research project to be conducted in a company will significantly contribute to experiential learning. Further to financial support through providing scholarship, the company's engagement in this project will involve providing not only the data and the information required to conduct the project, but also providing feedback as to the progress of the project and the final outcome.

Section 4: Program Description and Requirements

Section 4.1 Admission requirements

4.1.1 General and specific admission requirements

To be eligible for admission, applicants has to maintain at least a B average in their final two years of their undergraduate studies or have a cumulative grade point average (GPA) of at least 3.00 on a 4.30 scale, or equivalent from an accredited university. A GMAT / GRE score has to be provided. Applicants whose bachelor's degree was granted by a university where the medium of instruction is not English will also be asked to include their TOEFL scores with their applications.

The program is open to both full-time and part-time students. The following bachelor's degrees with high academic standing will be eligible: bachelor's degree in Commerce (or equivalent) with a major in any business discipline; bachelor's degree in any of the engineering disciplines; bachelor's degree in Economics / Mathematics / Applied Sciences.

To be eligible for admission, applicants must have maintained at least a B average in the final two years of their undergraduate studies and have obtained a Grade Point Average (GPA) of at least 3.00 on a 4.30 scale, or the equivalent, from an accredited university.

Applicants must submit proof of satisfactory performance on the Graduate Management Admission Test (GMAT) or the Graduate Record Examination (GRE) completed within the previous five years, two letters of recommendation with the Academic Assessment forms and a short statement of purpose. (Please note that the GMAT is preferred to the GRE).

Proficiency in English or French. Applicants whose first language is not English or French and who are not Canadian citizens or landed immigrants must obtain a satisfactory score in the Test of English as a Foreign Language (TOEFL) before being considered for admission. This requirement will be waived for foreign students completing their undergraduate degrees at a university where English or French is the language of instruction.

Concordia Comprehensive ESL Placement Test (ConCEPT). Applicants who have been admitted by a program and whose test results fall within the range requiring a language placement test are required to write the Concordia Comprehensive ESL Placement Test (ConCEPT).

4.1.2 Requirements for the degree

1. **Residence.** In accordance with standard university policy, the minimum residence requirement for this master's degree is three terms of full-time study, or the equivalent in part-time study. This requirement must be met regardless of the amount of graduate work previously completed in any other program or at any other university.
2. **Credits.** Fully-qualified candidates are required to complete a minimum of 45 credits.

Academic Regulations

1. **Credit Load: Full-time Students.** The normal course load for full-time students is 12 credits in each of the terms in the first year; 6 credits and the 15-credit applied research project in the second year.
2. **Credit Load: Part-time Students.** The maximum course load for part-time students is 12 credits per calendar year. The 15-credit applied research project should take 6 to 12 months to complete.
3. **Course Reduction.** In exceptional circumstances, students may be granted permission to reduce their course load below the normal specified above while remaining in good standing.
4. **Program and Course Withdrawal.** Students who wish to apply for withdrawal from the program must do so in writing at the office of the Associate Dean, Research and Research Programs. Students may drop a course up to the end of the course change period. This is normally about two weeks after classes begin (see Academic Calendar). In addition to the regulations which appear in the Graduate Registration section of the Graduate Calendar, students enrolled in the program will be required to observe the following rules.
5. **Academic Standing.** The scholastic performance of all masters' students will be reviewed on a regular basis. This assessment will be based on the final grades obtained in all seminars for which a student has registered subsequent to his or her admission into the program. To be considered in good standing at such a review, a student must maintain a cumulative grade point average (GPA) of 3.00 or better.
6. **Conditional Standing.** A student who has not fulfilled the above condition will be either a student on conditional standing or a failed student. A student on conditional standing who has not completed his or her seminars will be required to achieve a cumulative GPA of 3.00 or better by the time of the next assessment. A student who has completed his or her seminars and has not achieved a cumulative GPA of 3.00 will be required to repeat seminars or take up to six additional credits (two seminars) to meet the 3.00 GPA graduation requirement. The seminar(s) will be determined by the Departmental Program Committee. A student who does not satisfy the requirements of conditional standing will be considered a failed student and will be dismissed from the program.

7. **Failure Regulation.** Students who fail one seminar in the program will be dismissed from the program and may appeal for reinstatement. Students who fail a seminar and are readmitted may either repeat the seminar or replace it by taking another seminar. Students who fail a seminar after reinstatement will be dismissed from the program and will not be considered for reinstatement. Students who fail more than one seminar will be dismissed from the program and will not be considered for readmission.
8. **C Rule.** Students who receive more than one C during the course of their studies will be dismissed from the program. The student may appeal for reinstatement to the program director. Students who receive another C after reinstatement will be dismissed from the program and will not be considered for reinstatement.
9. **Time Limit.** All work for the master program degree for full-time students must be completed within 6 terms (two years) from the time of initial registration in the program at Concordia University; for part-time students, the time limit is 12 terms (four years).
10. **Graduation Requirement.** In order to graduate, students must have a minimum cumulative GPA of 3.00.

4.1.3 Selection procedures

An Admissions Committee comprising of faculty members from the supply chain management area at the Department will evaluate the applications and make a final decision as to acceptance. The students will be ranked based on their transcripts, examination scores, statement of purpose / letter of intent, work experience and reference letters. Those students with a bachelor's degree in a discipline other than SCM or Industrial Engineering will be required to complete a qualifying program during the summer term prior to starting the program. The qualifying program is described in Section 4.2.6.

4.2 Academic activity

4.2.1 Degree requirements

The degree requirements for the program consists of 6 credits of core seminars, 15 credits of SCM seminars, 9 credits of elective seminars and 15 credits of industry based applied research project, leading up to 45 credits in total.

4.2.2 Program schedule; core and elective seminars

The full-time students will start the program in the fall term (September) and complete it by end of next fall term (December). List of core seminars, SCM seminars and elective seminars are shown on the next page. Part-time students will be able to join the program in September or January. The seminar allocations for full-time and part-time students will be determined in close coordination with the academic advisor.

The current faculty expertise for teaching the SCM seminars in the program are provided below for the eight faculty members whose employment contract makes reference to individual's hiring in the SCM area.

| | MSCM 681 | MSCM 682 | MSCM 683 | MSCM 684 | MSCM 685 | MSCM 689 |
|---------------------|----------|----------|----------|----------|----------|----------|
| S.S Chauhan | ● | ◐ | ◑ | ◓ | ● | ● |
| S. Goyal | ◐ | | ◑ | ◐ | | ● |
| X. Huang | ◐ | ● | ◑ | ● | ◑ | ● |
| A. Satir | ● | ● | ● | ◐ | ◑ | ● |
| R. G. Saade | | | | | | ● |
| M. Sharma | ◐ | | | | | ● |
| R. Valverde | | | | | ◑ | ● |
| N. Vidyarthi | ● | ◑ | ● | ◓ | ◑ | ● |

| | |
|---|---|
| ● | Primary area of current research and teaching in this seminar's area |
| ◐ | Currently participating and collaborating in this seminar's area or similar areas (secondary area) |
| ◑ | Involved in research / taught in the past in this seminar's area |
| ◓ | Involved in related work in this seminar's area (teaching graduate courses, research collaboration or graduate student supervision) |

4.2.3 Number of credits per term / time to completion; academic advising

The duration of the program for the full time students is 16 months, i.e. four terms (including the summer term). The full time students will start the program in the fall term (September) and complete it by end of next fall term (December). The part-time students are required to complete the degree requirements within a period of four years from the date of enrollment into the program. An academic advisor will be assigned to each student who will oversee the academic progress of the student and provide guidance in academic matters.

Seminar sequencing for full time students (The qualifying program courses will be offered in the preceding winter and summer terms for those students admitted to the program without a bachelor's degree in SCM or Industrial Engineering.)

| Term | Category | Course Name |
|--------------------------|--------------------------|---|
| Fall (year of admission) | core seminars (2) | MSCA 602: Applied Linear Statistical Models MSCA 615: Research Methodology |
| | SCM seminars (2) | MSCM 681: Advanced Modeling and Optimization MSCM 682: Sourcing and Global Logistics |
| Winter | SCM seminars (3) | MSCM 683: Supply Chain Design and Coordination (prerequisite: MSCM 681 or equivalent) MSCM 684: Demand Management MSCM 685: Supply Chain Risk Management (prerequisite: MSCM 681 or equivalent) |
| | elective seminar (1) | one course from the following list of electives or one course outside JMSB (subject to academic advisor's approval): <ul style="list-style-type: none"> • MSCA 625 Seminar In Options and Futures • MSCA 645 Seminar in Organization Theory • MSCA 647 Seminar in Strategic Management • MSCA 668 Product Innovation and Marketing • MSCA 672 Seminar in Special Topics in Marketing • MSCA 652 Seminar in Special Topics in Management • MSCA 632 Seminar in Special Topics in Finance |
| Summer | applied research project | MSCM 689: Applied Research Project (prerequisite: at least 9 credits of SCM seminars) |
| Fall | applied research project | MSCM 689: Applied Research Project |
| | elective seminars (2) | two courses from the following list of electives (or one course from the list and one course outside JMSB) (all subject to academic advisor's approval) <ul style="list-style-type: none"> • MSCA 625 Seminar In Options and Futures • MSCA 645 Seminar in Organization Theory • MSCA 647 Seminar in Strategic Management • MSCA 668 Product Innovation and Marketing • MSCA 672 Seminar in Special Topics in Marketing • MSCA 652 Seminar in Special Topics in Management • MSCA 632 Seminar in Special Topics in Finance |

4.2.4 Content of the applied research project

As part of their degree requirement, the students are required to complete a 15-credit industry based 'applied research project', carried out individually or with a group of two students. The overall requirements and the extent of the SCM problem to be tackled will be the determining factor in deciding

whether the project will be carried out individually or with a partner. All initial contacts with the industry partner and contract preparation in this regard will be conducted by the project coordinator, as explained in Section 5.2.1. The scope, content, phases and timeline of the project will be decided by the industry partner and the academic supervisor. Every effort will be made to pair the students with the projects of their interests.

The overall driving objective in such a collaboration would be to provide an applied research platform for students in tackling real-life SCM problems and generating solutions that have academic and business merit. The project outcome should be of publishable quality in a recognized peer-reviewed journal and / or presentable in an established conference. The project will be supervised and the final project report will be evaluated solely by the academic supervisor, taking into consideration the feedback from the industry partner. When done by a group of two students, over and above evaluating the overall team work, there will be a significant individual evaluation component in grading the projects through progress reports, interim oral presentations, log books and peer review. Regular letter grading at graduate level (A+, A, A-, B+, B, B-, C and FNS) will be used in grading each group member. Intellectual property issues will be dealt in accordance with the rules and regulations in effect at Concordia.

4.2.5 Thesis or research proposal

This section is not applicable since the program does not involve a research thesis, but requires the completion of an applied research project at a company, as described in the previous section.

4.2.6 Course descriptions

Deficiency program courses for students that do not have an SCM or Industrial Engineering degree

Up to three qualifying program courses will be taken by those students who do not have an SCM or Industrial Engineering degree. These courses will be specified at the time of admission by the Admissions Committee, based on the academic background of the student. The deficiency program courses need to be successfully completed prior to starting the regular master program.

Core seminars common to MSc programs

MSCA 602 Applied Linear Statistical Models

The course focuses on systematic treatments of linear statistical models for regression, analysis of variance and experimental design with special emphasis on applications in business and economics. Topics include regression analysis: inference, model building, diagnostics, remedial measures and validation; single-factor and two-factor ANOVA models, and analysis of covariance. Other statistical tools for specialized applications discussed may include logistic regression, path analysis and time series regression. Case studies are employed to illustrate tools for fitting, checking, validating and interpreting linear models.

MSCA 615 Research Methodology – Administrative Sciences

The objective of this seminar is to provide a basic understanding of the research process and a knowledge of the methods used in the design and execution of scientific research relevant to social sciences, and specifically the business context. The seminar helps students to develop skills needed to assess the feasibility and potential contribution of proposed studies, and to critically evaluate research reported by others. The application of relevant research methods are reviewed through discussions of exemplary articles published in leading journals. Cornerstone topics in this seminar include: theory construction,

measurement, overview of data collection methods, reliability, as well as internal and external validity issues.

SCM seminars (five new seminars and an industry based applied research project)

MSCM 681 Advanced Modeling and Optimization

The supply chain planning problems are complex in nature. This seminar emphasizes the theoretical and practical aspects of advanced optimization modeling techniques in supply chain planning. Among the topics covered are network optimization, non-linear programming, stochastic programming, Markov processes and application of duality in developing decomposition-based solution approaches for large linear and integer models. Use of commercial modeling platform and optimization software are an integral part of this seminar.

MSCM 682 Sourcing and Global Logistics

This seminar covers the practices, techniques and regulations associated with sourcing and movement of materials in the global supply chains. Among the topics covered on sourcing are: impact of globalization on sourcing; supplier evaluation and selection; supplier performance management; purchasing, electronic procurement, negotiations, contract law; supplier relationship management. Issues in global logistics are discussed in the second half of the seminar. Among the topics covered are: distribution channels; warehousing; transportation management; reverse logistics; green logistics and sustainability; cross-border issues in logistics. The coverage is supplemented by case studies and research articles.

MSCM 683 Supply Chain Design and Coordination

This seminar focuses on managerial and modelling issues in supply chain design and coordination along the supply chain. Models in facility location, distribution networks and global supply chain networks are studied. The strategic aspects of supply chain design are discussed in terms of competitive supply chain drivers. The second part of the seminar deals with coordination issues. Among the concepts and models covered in this respect are: supply chain contracts; collaborative planning, forecasting and replenishment; bullwhip effect; postponement and vendor managed inventory. Articles, case studies, optimization software and simulation game are used as part of seminar delivery. (prerequisite: MSCM 681 or equivalent)

MSCM 684 Demand Management

Demand management is conceived as a pivotal function in managing supply networks. Such a 'pull' perspective requires managing demand uncertainty and leveraging various flexibilities along the supply chain. The seminar presents advance business forecasting tools that assist market analysis, revenue management tools that optimize operational performance and approaches in building flexibilities to enhance manufacturing and organizational capabilities. Among the topics covered are: advanced forecasting models, judgmental forecasting and adjustment, customer relationship management, consumer choice models, dynamic pricing, capacity control, network revenue management, manufacturing and organizational flexibilities. The seminar content is delivered via a combination of lectures, case analyses and research articles.

MSCM 685 Supply Chain Risk Management

Strategies for managing the various risks along the supply chain are studied. Quantitative and qualitative approaches used in analyzing such risks and scenarios are covered. The seminar discusses risk identification and management, trade-offs in risk management, strategies for robustness, scenario planning, financial risks and disruption planning. The approaches used for modelling and analyzing the supply chain risks are presented through lectures, case analyses and research articles. (prerequisite: MSCM 681 or equivalent)

MSCM 689 Applied Research Project (15 credits)

Supervised (co-supervised) by a faculty member(s), the applied research project is carried out individually or by a group of two students, depending on the overall requirements and extent of the project to be conducted. The project involves working on a real-life supply chain management problem provided by a company. Once the problem is defined, the students prepare an overall project management plan to tackle the problem within the given time limit. The various stages of the project will involve, among others: literature review; defining data and information requirements for problem analysis; gathering data; designing the appropriate model; conducting experimental design runs and sensitivity analyses; presenting the solution(s) with an implementation plan. The project outcome is expected to have both academic and business merit. For projects done in groups of two students, there is a significant individual evaluation component in assessing the work done by each student. (prerequisite: at least 9 credits of SCM seminars)

Elective seminars offered by the MSc programs at JMSB (three elective seminars from the below seminars or two elective seminars from the below seminars and one seminar outside JMSB; all subject to approval of the academic advisor)

MSCA 625 Seminar In Options and Futures

This course addresses exchange-traded as well as over-the-counter derivatives such as futures, options, and swaps. The institutional characteristics of futures markets, such as margin requirements and price limits, which have received much attention from policy-makers world-wide, since the stock market crash of October 1987, are discussed. The use of derivatives in risk management by corporations and financial institutions is examined. Innovations in risk measurement and management such as value at risk and credit risk models are analyzed. Capital adequacy regulations under the Basle accord, regulatory capital arbitrage by banks and the sub-prime mortgage crisis are studied.

MSCA 645 Seminar in Organization Theory

This course is a research-oriented seminar, in which we will explore organizations and organizational environments. The primary aim of the seminar is to introduce students to an understanding of how organizational scholars have conceptualized and studied organizations as systems of structures and relations and as cultural systems, and how these systems interact with and are embedded in the context of an external environment. To accomplish this aim the seminar focuses on some basic sociological tools for conceptually investigating a variety of organizational topics. At the end of the seminar, students would have acquired an in-depth understanding of how organizations are made up of formal, relational and cultural structures both inside and outside the organizational boundary. The course will begin with an introduction to what organizations are, followed by an overview of how organizations are studied as a structural context for behavior, as unique social actors in the context of an external environment, and as part of a structured interdependent system of actors and meanings. We will then explore different types of social structural arrangements in organizations, based on formal systems, networks of relationships, cultures, identities, and institutions. We consider structural arrangements through which organizations are tied to the external environment and the cultural structures that constitute that environment. Some topics and conceptual frameworks we will cover in these discussions include power, conflict, organizational identity and image, organizational control, discourse and rhetoric, legitimacy, organizational impression management, emergence of new organizations, and organizational change.

MSCA 647 Seminar in Strategic Management

This seminar is designed to introduce MSc students to various theoretical perspectives on strategic management and the processes through which strategies are formulated and implemented. It helps students to understand central strategic management concepts and their foundations. Some of these perspectives and analytical techniques will be critically reviewed to understand the extent to which they can help researchers and practitioners to analyze real world situations. Covering all aspects of a complex and broad field such as strategic management in one seminar is simply impossible. Therefore, the main

objectives of this seminar will be more focused on providing an overview of different steps in strategic management process at business and corporate level, making critical analysis of some of the main frameworks introduced by scholars, and providing a general understanding of the strategic management research. The first session will be an introduction to the concept of strategy through an overview of the most common perspectives for understanding strategic management process in the literature. Then, some of the main topics on formulating as well as implementing strategies, as two essential steps in this process, will be discussed throughout the semester. There will be more sessions on the formulation process and the related theories and perspectives as well as the analytical frameworks for crafting various business and corporate strategies. There will be a few sessions on some of the major topics related to the implementation process such as control, governance, and organization design.

MSCA 668 Seminar in Product Innovation and Marketing

This seminar acquaints students with well-known approaches to managerial decision-making and research in the area of Product Innovation and New Product Marketing. Analytical approaches presented in recent publications, combined with some important “classics”, will be stressed. The course focuses primarily on new product development/marketing and attempts to cover a variety of topics, strategies, phases and analytical approaches relevant to this subject area.

MSCA 632 Seminar in Special Topics in Finance

MSCA 652 Seminar in Special Topics in Management

MSCA 672 Seminar in Special Topics in Marketing

4.2.7 Curriculum map (learning objectives vs. SCM and core seminars)

The learning objectives presented in Section 2.2 and the relevant seminars are repeated in this section, so that a curriculum map can be provided. Such a curriculum map is provided below illustrating how these learning objectives are to be realized through the SCM and core seminars offered in the program: (A scale from 0 – 5 is used in the map, where a 0 indicates no realization and a 5 indicates the highest level of realization.)

Learning objectives:

- i) understand the integrative, interdisciplinary nature of SCM,
- ii) through critical thinking, analyze and design supply chains using appropriate quantitative and qualitative tools, techniques and approaches; generate solutions to supply chain problems that have academic and business merit,
- iii) develop quantitative modeling skills in managing supply chains and using software in this respect, and
- iv) develop applied research skills.

SCM and core seminars:

- MSCM 681 Advanced Modeling and Optimization
- MSCM 682 Sourcing and Global Logistics
- MSCM 683 Supply Chain Design and Coordination
- MSCM 684 Demand Management
- MSCM 685 Supply Chain Risk Management
- MSCM 689 Applied Research Project
- MSCA 602 Applied Linear Statistical Models
- MSCA 615 Research Methodology – Administrative Sciences

| Learning Objectives | | | | | |
|----------------------------|-------------------|--------------------|-----------------------|------------------|--|
| Seminar | interdisciplinary | analyze and design | quantitative modeling | applied research | |
| MSCM 681 | 2 | 3 | 5 | 2 | |
| MSCM 682 | 4 | 5 | 3 | 3 | |
| MSCM 683 | 4 | 5 | 4 | 3 | |
| MSCM 684 | 4 | 5 | 4 | 3 | |
| MSCM 685 | 4 | 5 | 4 | 3 | |
| MSCM 689 | 3 | 5 | 5 | 5 | |
| MSCA 602 | 3 | 2 | 5 | 3 | |
| MSCA 615 | 3 | 2 | 3 | 5 | |

4.2.8 Intellectual atmosphere

During the course of the study, the students will interact with local industry through site visits and tours in and around the region. The students will be encouraged to present their work at the Annual Graduate Research Exposition, an event organized by JMSB towards the end of fall term. The student will be encouraged to attend the seminars hosted by the CN Centre for Sustainable Supply Chain Management as well as the David O'Brien Centre for Sustainable Enterprise. These centers host seminar series in fall and winter terms by inviting speakers from academia and business.

Section 5. Faculty Resources, Other Human Resources and Material Resources

5.1 Faculty resources

5.1.1 Brief biographies of faculty members in the SCM area

As explained in Section 3.3.4, the Department of Supply Chain and Business Technology Management houses three disciplines: i) supply chain operations management, ii) business technology management and iii) business statistics. In this section, the brief biographies of tenured, tenure track and extended term appointment faculty members are provided in alphabetical order, organized by discipline (as indicated on the contract when the member joined the Department). The details of abridged CVs incorporating scholarly works, awards / grants received and graduate student supervision are provided in Appendix 5.

Supply Chain Operations Management

Satyaveer S. Chauhan (associate professor) holds a PhD degree in from University of Metz in Automation and a Master's degree in Industrial and Management Engineering from Indian Institute of Technology, Kanpur. He teaches courses in supply chain logistics, operations management and management science. His research focuses on production planning, supply chain management and logistics. His publications have appeared in, among others, *International Journal of Production Research*, *European Journal of Operational Research*, *OR Letters* and *Decision Support Systems*. Dr. Chauhan has co-supervised several graduate and postdoctoral students. His research is supported by grants from NSERC and SHHRC.

Suresh Kumar Goyal (full professor) has published over 300 papers / technical notes / view points in refereed OR / OM journals. His research contributions have appeared, among others, in *Management Science*, *Operations Research*, *Journal of the Operational Research Society*, *European Journal of Operational Research*, *Naval Research Logistics*, *International Journal of Production Research*, *International Journal of Production Economics*, *Computers & Industrial Engineering*. He serves on editorial boards of several international journals.

Xiao Huang (assistant professor) holds a PhD degree in Operations Management and MSc degree in Mathematical Finance from the University of Southern California (USA) and a BEng degree in Electronic Engineering from Tsinghua University (China). Her research focuses on supply chain management, competition and cooperation in supply chains, pricing/product strategy and supply chain risk management. Her work has been published by reputed journals including *Manufacturing & Service Operations Management*, *European Journal of Operational Research* and *Naval Research Logistics*. Her research has been supported by national and provincial funding agencies such as NSERC and FQRSC. Dr. Huang's current teaching involves supply chain management and operations management in both undergraduate and graduate levels. She has also been a member of graduate thesis committees at both JMSB and ENCS.

Dr. Raafat George Saade (associate professor) has been teaching in the JMSB since 1998. He obtained his PhD in 1995 (Concordia University). He then received the Canadian National Research Council postdoctoral fellowship, which he completed at McGill University. Dr. Saade has published in journals such as *Information & Management*, *Decision Sciences*, *Computers & Education*, *Journal of Information Systems Education*, *Journal of Applied Logistics*, and *Expert Systems with Applications*. Dr. Saade's multi-disciplinary research interests include the development and assessment of information systems, supply chain of digital information products, disaster relief supply chain and change management.

Ahmet Satir (full professor) holds a PhD degree from University of Manchester, Institute of Science and Technology (England), an MSc degree in Engineering Production from University of Birmingham (England) and a BSc degree from Middle East Technical University (Turkey). His research over the years focused on just-in-time based practices, flexible manufacturing systems and operations planning and control. His more recent research interests involve supply chain risk management and sustainable supply chains. His publications have appeared in, among others, *International Journal of Production Research*, *European Journal of Operational Research*, *Omega*, *Production Planning and Control*, *Journal of Supply Chain Management* and *Risk Management*. Dr. Satir's current teaching areas are in supply chain management and operations management. He has served as a supervisor or co-supervisor for numerous graduate theses, as well as a committee member at thesis committees. His consulting and applied research work on operations management and supply chain management spans over a number of industries, including automotive, aerospace, pharmaceutical and textiles. Dr. Satir is currently the Director of Canadian National (CN) Centre for Studies in Sustainable Supply Chain Management, a recently established applied research centre at JMSB funded by CN.

Mahesh Sharma (associate professor) holds Master of Engineering and Master of Business Administration degrees from McGill University. He also holds BEng from Defence Training College, India. He has twenty-eight years of industrial experience and thirty-eight years of teaching experience in the field of Operations Management. He has taught Supply Chain Operations Management courses both at graduate (MBA, EMBA, AMBA and MEng) and undergraduate level. One of his recent presentations on supply chain management was at Society of Operations Management Conference in India. His research interest is on modeling of supply chain management, inventory control and logistics. He is a member of a number of professional learned societies in the fields of Supply Chain Management and Quality Management.

Raul Valverde (lecturer) holds a PhD in Business Administration from the University of Southern Queensland (Australia), a MEng in Electrical and Computer Engineering from Concordia University (Canada), a Post MBA in Management Science from McGill University (Canada), a MSc in Financial Management with specialization in Supply Chain Finance from the University of the West of England (England), and a BSc in Mathematics and Management from Excelsior College of the University of New York (USA). He is also a registered professional engineer in Ontario and has several certifications in supply chain management, information technology and forensics. His research interests include supply chain finance, supply chain fraud, supply chain systems, risk management, reengineering and e-business. He has published, among others, in the *International Journal of Business Performance and Supply Chain Modelling*, *Journal of Information Systems and e-Business Management*, *Journal of Theoretical and Applied Electronic Commerce Research* and *Journal of Intelligent Decision Technologies* among others. Dr. Valverde is currently teaching in the areas of Operations Management and Business Technology Management for the undergraduate and MBA programs. He has consulted CGA Canada for its risk management curriculum, reviewed operations management books for different publishers, consulted Champlain College for the development of its curriculum for the transportation and logistics program and has supervised research at the University of Liverpool in England where he holds an honorary lecturer status in the Faculty of Science and Engineering. Dr. Valverde is also the academic director of the co-op undergraduate program in Supply Chain Operations Management and Business Technology Management.

Navneet Vidyarthi (assistant professor) holds a PhD degree in Management Science from University of Waterloo (Canada), an MSc degree in Industrial Engineering and Operations Research from University of Windsor (Canada) and a BTech degree in Mechanical Engineering from North Eastern Regional Institute of Science and Technology (India). His research interests involve supply chain management, network design and optimization with methodological interests in large-scale optimization, simulation-based optimization and meta-heuristics. His publications have appeared, among others, in *Transportation Science*, *IIE Transactions*, *European Journal of Operational Research*, *International Journal of Production Research* and *Quality Management Journal*. His teaching interests are in the area of Operations Management, Logistics and Supply Chain Management, Product Design and Business Process Reengineering. He has taught at the undergraduate and MBA levels. He has co-supervised / (is) co-supervising graduate thesis work at doctoral and masters level, and served on thesis committees. He holds external research grants from Natural Sciences and Engineering Research Council of Canada (NSERC) and Fonds Québécois de la recherche sur la société et la culture (FQRSC). His research is also funded by the CN Centre for Studies in Sustainable Supply Chain Management at the John Molson School of Business. In 2013, he has been awarded the Petro Canada Young Innovator of the Year.

Business Technology Management

Anne Beaudry (associate professor) received her PhD degree in Administration from HEC, Montreal and MBA and BAA degrees from UQAM, Montreal. Dr. Beaudry's research focuses on information technology related reactions and behaviours by individuals such as emotions, cognitions, adaptation and usage. She is a member of the 'Centre for Multidisciplinary Behavioral Business Research. Her research has been published, among others, in the *MIS Quarterly*, *Journal of Strategic Information Systems*, *Computers in*

Human Behavior and *International Journal of Knowledge Management*. Dr. Beaudry has been awarded research grants by the FQRSC and SSHRC. She teaches undergraduate and graduate courses on management of information systems and supervises PhD theses.

Meral Demirbag Büyükkurt (associate professor) obtained her BA in Accounting and Finance from Bogazici University (Turkey), her MBA (Major in Decision Sciences) from Indiana University and her PhD in Business with a major in Decision Sciences and minors in MIS and Statistics from Indiana University. She was a visiting assistant professor at Washington State University (1983-84), visiting scholar at Indiana University (1991-1992) and a visiting associate professor at Koç University, Turkey, (1994-1996). She was a member of the team responsible for developing the curriculum model for Sabanci University's Graduate School of Management (Turkey) in 1997-1998 and then developed the Management Information Systems curriculum for the Graduate School of Management. She chaired the committee that developed the MSc in Management Information Systems at Concordia University and recently served on the committee that developed Business Technology Management curriculum. She has supervised MBA and MSc theses and served on MBA and MSc thesis committees. Her research was funded by NSERC. Her current research interests include technology adoption in business education and uncertainty and conflict management in systems analysts' teams. Her publications have appeared in *Decision Sciences*, *Journal of Marketing Research*, *International Journal of Production Economics*, *IIE Transactions*, *Canadian Journal of Administrative Sciences*, *Journal of Information Technology Education* and *Issues in Informing Science and Information Technology*.

Anne-Marie Croteau (full professor) is the associate dean responsible for external relations and business development at JMSB. She obtained her PhD in Management Information Systems at Laval University (Quebec City); her MSc and BComm in MIS at HEC Montréal; and her BSc in Actuarial Mathematics at Concordia University. She also received the designation of Chartered Director from The Directors College at McMaster University. Dr. Croteau teaches at the doctoral, master and undergraduate levels. Her courses cover topics such as strategic management of information technology, fundamentals of electronic business and management of information systems. She was the co-founder and director of the Graduate Certificate in e-Business Program, and director of the Executive MBA and Global Aviation MBA Programs. Her research focuses on inter-organizational governance of information technology, strategic management of information technology, globalization of information systems, and health information systems. She supervises MSc and PhD theses on a regular basis. Holder of SSHRC and FQRSC grants, her research is highly cited and has been published in various scientific journals such as *Journal of Strategic Information Systems*, *Journal of Information Technology*, *Canadian Journal of Administrative Sciences*, *IEEE-Transactions on Engineering Management*, *International Business Research*, *International Journal of Knowledge Management*, *Industrial Management & Data Systems*, *Information Systems Frontiers*, as well as in various national and international conference proceedings. She is a recipient of the JMSB Dean's mid-career award for distinguished scholarship.

Gregory Kersten (full professor) holds a PhD degree in Economic Sciences and MSc degree in Econometrics from the Warsaw School of Economics (Poland). He is the Senior Concordia University Research Chair in Decision and Negotiation Systems and the Director of the InterNeg Research Centre. He is a co-author and editor of six books and chapters and numerous journal articles. His research contributions have appeared, among others, in *Computers and Mathematics with Applications*; *Decision Support Systems*; *Management Science*; *Electronic Commerce Research and Applications*; *Electronic Markets*; *Group Decision and Negotiation*; *IEEE Expert*; *IEEE Systems, Man, and Cybernetics*; *International Journal of Expert Systems*, *Information and Management*; *European Journal of Operational Research*; *Naval Logistic Research*; *Theory and Decision*. He is a vice-president of the INFORMS GDN Section, the senior editor of the *Group Decision and Negotiation Journal* and a reviewer and assessor for national and international research councils. He has received grants from NSERC, SSHRC, HDRC, Humboldt Foundation (Germany), and Max Bell Foundation,

among others. He has supervised research at post-doctoral level and graduate thesis work at doctoral and masters levels in Canada, Germany, Italy and Poland.

Dennis Kira (full professor) received his BSc and MSc degrees in Mathematics from Simon Fraser University and his PhD degree in Management Science from the University of British Columbia. He teaches system design, decision support systems, data management, data mining, internet related programming and e-commerce. His research focuses on e-commerce, web design, distance learning, decision-making uncertainty, neural networks, machine learning and financial modeling. He has published, among others, in the *Journal of Information Technology in Education*, *Journal of Asynchronous Learning Networks* and *Issues in Informing Science and Information Technology*.

Chitu Okoli (associate professor) holds a PhD degree in Business Administration (information systems and decision sciences), an MS in Information Systems and Decision Sciences and a BS in Computer Science from Louisiana State University, Baton Rouge. He teaches business data communications, management information systems, object-oriented programming, systems analysis and design and website development. His research focus on open content and open source software, applications of the internet in developing countries and systematic literature reviews. He has published, among others, in the *International Journal of Information Technology and Management*, *Journal of Information Technology Research*, *European Journal of Information Systems* and *Journal of Computer Information Systems*.

Rustam Vahidov (full professor) obtained his PhD and MBA degrees in Decision Sciences at Georgia State University, Atlanta and a BSc degree in Management Information Systems from Azerbaijan State Oil Academy, Baku. Dr. Vahidov's areas of expertise are in agent based systems, decision support systems, fuzzy logic, genetic algorithms and neural networks. He holds an RBC Professorship in Inter-organizational IT Governance. His research has been funded by NSERC, SSHRC and Australian Research Council. Dr. Vahidov's publications appeared, among others, in *Electronic Commerce Research and Applications*, *Decision Support Systems*, *Journal of Computer Information Systems*, *Group decision and Negotiation* and *European Journal of Operational Research*.

Business Statistics

Clarence Bayne (full professor) holds a PhD degree in Economics from McGill University, an MA degree in Economics and a BA degree in Economics and Political Science from the University of British Columbia. He teaches graduate courses in economics for non-profit managers and finance and economics of health care. His research in statistics focuses primarily on forecasting and sampling theory, with special emphasis on the applied aspects of these fields of study. His research is supported by the David O'Brien Sustainability Center for Sustainable Enterprise. Dr. Bayne is the Director of Institute for Community Entrepreneurship and Development (ICED) and has received several distinguished awards from the Federal and Municipal Governments. Professor Bayne is a member of CIM, an advisory committee to the Mayor of Montreal and a member of an advisory body to the Minister for cultural communities, Government of Quebec.

Dale Doreen (full professor) obtained his BS, MA and PhD degrees in Business Statistics from the University of Alabama and did post-doctorate studies at the University of Pennsylvania's Wharton School. He was the Chairman of the Department of Quantitative Methods from 1978 to 1980. At Concordia, Dr. Doreen has taught various courses in statistics, operations research and entrepreneurship. He served as Academic Director of the Executive MBA Program from 1986 to 1992, and is listed in *Who's Who in Canada*, and *Who's Who in Canadian Business*. As well, Dr. Doreen served several years on the International Advisory Board of the University of Alabama's School of Business. His research interests involved a variety of topics including nonparametric statistics, credit scoring, entrepreneurship and small business management. He has published a number of papers over the years on these and other topics. In recent years Dr. Doreen has been heavily involved in the aviation industry. He served as the Director of Concordia's International

Aviation MBA Program (1994-2003) and as the Executive Director of International Center for Aviation Management Education and Research (1998 – 2007). Dr. Doreen, in 1997, held the position as Associate Dean, Executive Program, at Dubai Enterprises Aviation University, in Dubai, UAE. He is currently working on a project to establish an aerospace university in India.

Jamshid Etezadi-Amoli (full professor) holds a BEng from Arya-Mehr University of Technology (renamed as Sharif), Tehran, Iran, and an MA and PhD in Measurement, Evaluation and Computer Applications from the Ontario Institute for Studies in Education, University of Toronto. Prior to joining Concordia University, he worked at the Ontario Cancer Institute, and the Department of Epidemiology and Biostatistics, University of Toronto. He spent one year at Michigan State University as a visiting scholar where he taught graduate courses in statistics and directed the Office of Research Consultation of the University. Dr. Etezadi's teaching and research interests include both statistics (particularly structural equation modeling) and information systems (IS). He is affiliated with two research centers at Concordia: the 'Centre for Research in Human Development (CRDH)' where he applies his knowledge of statistics on issues related to aging and retirement, and the 'InterNeg Research Centre' where he studies issues related to negotiation and development of information systems. He served as a supervisor or committee member of over thirty-five graduate students and worked as a consultant with several organizations, including the Royal College of Physicians and Surgeons of Canada, West Park Research, the Montreal Children's Hospital, the Royal Victoria Hospital, Iperception 360 Inc. and Novatech International. His present research interests focus on methods for assessment of multi-attribute utility functions and development of decision support systems for group decisions and negotiations. His articles have appeared in peer-refereed journals, including *Psychometrika*, *British Journal of Cancer*, *Pediatrics*, *Biometrics*, *Journal of Organizational Behavior and Human Performance*, *Communication in Statistics*, *Psychology and Aging*, *MIS Quarterly*, *Information and Management* and *Journal of Computer Information Systems*.

Tak Mak (full professor) obtained his BSc degree in Mathematics from the Chinese University of Hong Kong. He also holds an MA in Mathematics from York University and a PhD in Statistics from the University of Western Ontario. He also served as a statistics consultant while he was with the University of Hong Kong and was the Director of Statistics Laboratory of the Memorial University of Newfoundland in 1989. He had served as an Associate Editor of the Canadian Journal of Statistics and was an elected member of ISI. He was appointed by NSERC as a committee member of the Statistics Grant Selection Committee for the period 1994 to 1997. He teaches statistical models for business research, survey design and analysis and multivariate analysis. His research focuses on statistical methods using the Bootstrap, heteroscedastic regression models, survey estimation methods, probability distribution modeling, errors-in-variables and off-line statistical quality control. His research appears in international journals such as the *Journal of the Royal Statistical Society*, *Applied Statistics*, *Biometrika*, *Computational Statistics and Journal of Multivariate Analysis*. He had developed new courses in linear modeling in business data analysis, experimental designs and multivariate data analysis.

Danielle Morin (full professor) obtained her BSc (Mathematics) and MSc (Statistics) from the Université de Montréal, and a PhD (1989) in Statistics from McGill University. Her major academic interests are business statistics and multivariate statistics, which she has taught in the Undergraduate Program, MBA Professional and Executive Programs, the MSc and the Joint PhD Programs. Her current research interests are focused on university education, namely the impact of technology integration and interdisciplinary on student's learning and acquisition of higher order thinking skills. She has presented her research in several international conferences and published in academic journals, such as the *Journal of Computer Technology and Applications*, *Computers in Human Behavior* and the *Journal of Distance Education Technologies*. She has also co-authored a book entitled *Statistics Applied to Canadian Issues*, published by Ginn Press. Over the years, Dr. Morin has held several senior administrative positions at Concordia University, such as Associate Dean, Undergraduate Programs, Associate Dean Graduate Programs, Research and Program Evaluation. From 2004 to 2008, she has held the newly created position of Vice-Provost, Academic

Programs. In 2005, Dr. Morin was awarded the YWCA Women of Excellence Award in the Education Category as well as the Concordia Alumni Recognition Award for teaching excellence. In 2012, she was awarded the first Concordia Academic Leadership Award for her outstanding leadership. In 2013, she was the JMSB nominee for Concordia University President Award for Teaching Excellence.

Fassil Nebebe (full professor) holds a PhD degree from Queen's University in Kingston, Canada, an MSc from Southampton University in Southampton, England, and a BSc from Haile Selassie I University in Addis Ababa, Ethiopia. He teaches undergraduate and graduate courses on applied linear statistical models, research methods, managerial statistics and business statistics. His research focuses on Bayesian and empirical Bayes methods in small areas, Gibbs sampling, data modeling and statistical computing. He has published, among others, in the *Journal of Information Technology in Education*, *Journal of Information and Information Technology in Education*, *Journal of Asynchronous Learning Networks* and *Issues in Informing Science and Information Technology*.

5.1.2 Faculty capabilities in teaching and supervision

As presented in Section 5.1.1 and in Appendix 5, the Department has qualified academic faculty members to teach and supervise the applied research projects. Due to the interdisciplinary nature of the program, adjunct faculty from the Concordia departments of Management, Marketing, Finance and Mechanical / Industrial Engineering may also contribute to co-teaching and co-supervision. As such, it is safe to conclude that the faculty resources at the Department, JMSB and the Faculty of Engineering and Computer Science are adequate to conduct a highly qualified teaching and research program.

5.1.3 Regulations governing student supervision

The current regulations in effect at the School of Graduate Studies for governing master student supervision will be in effect for the proposed program.

5.1.4 New faculty required

As indicated in the chart of expenses and revenues presented in Section 5.5, it is planned that one new faculty member will be hired as of the beginning of the third year of the program. This tenure track position will be at the assistant / associate professor level. The candidate sought for this position will be required to have a interdisciplinary teaching and research interest in SCM with an additional background in one other business discipline (such as, management, marketing, finance) and / or in sustainability.

5.1.5 Present and future workloads

The current faculty members eligible to teach in the program carry a workload of total four courses over one academic year. Following the launch of the program, five new courses in SCM will be taught by eligible faculty members per academic year. Thus, five additional courses need to be taught by part-time instructors to make up for new course deliveries. The remaining course load of 15 credits (five courses) will be offered through the existing core courses (6 credits) and elective courses (9 credits). Hence, no new faculty assignment would be required for these courses. However, there may be an additional section required for one or both of the two core courses (MSCA 602, MSCA 615) depending on the class size for these courses at the time and the number of additional students coming from the proposed program.

5.2 Other human resources

5.2.1 Project coordinator

A project coordinator will be hired to act as liaison between the program and the companies where the applied research project will be conducted. The coordinator will be responsible from initiating contacts with companies, coming up with research proposals in close collaboration with faculty members and company representatives, drafting research contracts and carrying out administrative duties during the entire project

cycle. The project coordinator will report to the Department chair. All academic supervision of projects will be conducted by the eligible faculty members.

5.2.2 Technical staff

There will be no need for additional technical staff at the computer laboratory. The current technical staff resources available at the JMSB's Centre for Instructional Technology (CIT) will be utilized in this respect.

5.2.3 Additional support staff

No additional support staff is anticipated, with a possible exception of a part-time staff to be employed at the MSc and PhD Office of JMSB to assist the additional work load in terms of processing applications. It is assumed that the current staff at the MSc and PhD Office will be sufficient otherwise to handle the administrative requirements of the new program.

5.2.4 Teaching assistants

Five new teaching assistants are envisaged for the five new courses to be taught in the program. These assistants will preferably be chosen among PhD students.

5.3 Material Resources

5.3.1 Libraries

Most of the common periodicals related to the discipline are already available for members' research interest and PhD programs. Since, all of these periodicals are electronically accessible and therefore adding this graduate program in this area would not affect the library services and resources. A detailed report of library resources in the SCM area is presented in Appendix 3. An allowance of \$4,580 per year is included in the budget to cover the recurring library collection expenditures.

5.3.2 Computer facilities

The Department already has two computer laboratories. The technical support is provided by CIT. The required optimization, simulation and statistics software are already installed. The proposed Program will not require any extra computer facilities or software.

5.3.3 Laboratories

No new laboratories are needed. (Please refer to the previous section for 'Computer facilities'.)

5.3.4 Classrooms

On average, one section of three new courses will be offered in each regular term. Thus, three small size classrooms (for 10-15 students) per week will be required during each term, each for three hours.

5.3.5 Research space

Current research space available to MSC students at JMSB will be used. Hence, no new research space will be needed.

5.3.6 Studio facilities

This sub-section is not applicable.

5.3.7 Equipment

This sub-section is not applicable.

5.3.8 Administrative office space

One office in the MB Building will be required for the project coordinator. Another office will be required for the newly hired faculty member as of the beginning of the third year.

5.3.9 Student workspace

Students will use the research space referred in Section 5.3.5. No additional space will be required in terms of student workspace.

5.4 Funding for graduate students

5.4.1 Sources for graduate student funding

The sources for student funding will be: i) regular Concordia graduate funding sources and ii) companies in private sector, and iii) CN Centre for Studies in Sustainable Supply Chain Management. For item (ii), companies in manufacturing and service sectors will be contacted for possible collaboration with respect to the applied research project that the students will conduct during the last phase of their program. The companies that agree to be collaborators in the applied research project will be asked to provide scholarships. CN Centre will also be allocating funds annually for scholarships. Additional funding in the form of research assistantships will also be available from faculty members who hold research grants.

5.4.2 Amounts needed and anticipated for graduate student funding

The program will aim to secure a minimum of \$5,000 scholarship from companies for every full time student. The anticipated student intake of 11-16 students per cohort (full-time equivalent) would require funding in the range of \$55, 000 – \$80,000 on an annual basis. This is deemed to be an achievable target that can be met, provided that the applied research project initiative is successfully conducted at companies. The students will also have the opportunity to apply for the on-going scholarship awards at Concordia and can also be further funded through research centres and faculty members' research grants.

5.5 Chart of expenses and revenues

The chart of expenses and revenues are presented on the next two pages. It is indicated in the chart if the item in question is costed at a fixed rate over a five-year horizon. Otherwise, an increase of 2.5% over the previous year's cost is assumed. On the revenue side, the current tuition rate and the contribution margins from the Ministry are assumed not to change for the 2015-2020 period. This last assumption is rather a conservative one. Hence, one can expect the actual revenues to be higher.

There is an expected loss of \$10,452 for the first academic year of operations. However, offset by the surpluses for the next four years, it is expected to have a net surplus of \$226,209 over a five year period (not considering the net present value aspects).

| | Expenses | | | | |
|---|-----------------|---------|---------|---------|---------|
| | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
| Number of new full time faculty members | | | 1 | 1 | 1 |
| Average salary | | | 135,000 | 135,000 | 140,400 |
| Salary increase (4%) | | | | 5,400 | 5,616 |
| Total New Salary | | | 135,000 | 140,400 | 146,016 |
| Moving expenses | | | 5,000 | 0 | 0 |
| Start-Up funds | | | 15,000 | 0 | 0 |
| Recurring costs | | | 1,750 | 1,750 | 1,750 |
| Number of extra courses | 5 | 5 | 1 | 1 | 1 |
| Course releases due to project supervision (@84 credits) | 0 | 2 | 2 | 3 | 3 |
| Total extra courses | 5 | 7 | 3 | 4 | 4 |
| Extra courses taught by part time faculty | 5 | 7 | 3 | 4 | 4 |
| Part-time faculty salary (@ \$ 8,000) | 40,000 | 56,000 | 24,000 | 32,000 | 32,000 |
| Library expenses | 4,580 | 4,580 | 4,580 | 4,580 | 4,580 |
| Secretarial support | 4,000 | 4,100 | 4,202 | 4,308 | 4,415 |
| Project coordinator | 75,000 | 76,875 | 78,797 | 80,767 | 82,786 |
| Teaching Assistants (\$300/course) | 1,500 | 1,538 | 1,576 | 1,615 | 1,656 |
| Marketing and Advertisement | 7,000 | 7,000 | 7,000 | 7,000 | 7,000 |
| Total Expenses | 132,080 | 150,093 | 276,905 | 272,420 | 280,203 |

Revenues

| | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
|---|-----------|-----------|-----------|-----------|-----------|
| New Admissions | 10 | 10 | 14 | 14 | 14 |
| Number of new students to Concordia only | 10 | 20 | 24 | 28 | 28 |
| Average number of program credits per year per student | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Number of program FTEs | 7.5 | 15 | 18 | 21 | 21 |
| Weighted program FTEs | 4.42 | 113,868 | 227,737 | 273,285 | 318,833 |
| Tuition fees (RAW) | 1034,592 | 7,759 | 15,518 | 18,622 | 21,726 |

| | | | | | |
|-----------------------|---------|---------|---------|---------|---------|
| Total Revenues | 121,628 | 243,256 | 291,908 | 340,559 | 340,559 |
|-----------------------|---------|---------|---------|---------|---------|

| | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 |
|----------------------------------|------------------|---------|---------|---------|---------|
| Total Revenues | 121,628 | 243,256 | 291,908 | 340,559 | 340,559 |
| Total Expenditures | 132,080 | 150,093 | 276,905 | 272,420 | 280,203 |
| Balance | -10,452 | 93,163 | 15,003 | 68,139 | 60,356 |
| 5 year total revenues | 1,337,910 | | | | |
| 5 year total expenditures | 1,111,701 | | | | |
| 5 year net surplus | 226,209 | | | | |

5.6 Implementation timetable for the program

The approval process that the program proposal has to go through is provided below with an implementation timetable. The letter of support from the Dean is provided in Appendix 4.



| | |
|--|----------------|
| Department approval | 22-Oct-13 |
| MSc Local Committee | 4-Nov-13 |
| Faculty Academic Planning Committee | 29-Nov-13 |
| Faculty Council Steering Committee | 3-Dec-13 |
| Faculty Council | 13-Dec-13 |
| Graduate Curriculum Committee | 13-Jan-14 |
| CSGS Steering Committee | 28-Jan-14 |
| Council of the School of Graduate Studies | 10-Feb-14 |
| Academic Programs Committee | 27-Feb-14 |
| Senate Steering Committee | 4-Mar-14 |
| Senate | 14-Mar-14 |
| CREPUQ | - |
| Le Ministère de l'Éducation, du Loisir et du Sport | - |
| Anticipated launch of the 'Master of SCM' program | September 2015 |