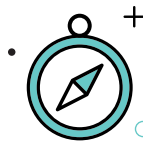


# MSSCM Three-Semester Course Plan



## PREPROGRAM FOUNDATIONS REQUIREMENTS

Preparatory work begins in July, is in addition to required credits, and does not affect GPA.

ACCT 560: Introduction to Accounting

FIN 510: Introduction to Finance

*Intensive, on-campus course in early Fall (letter-graded)*

OMM 510: Operations Management Foundations **2 credits**

FALL 1 REQUIRED COURSES	SPRING REQUIRED COURSES	FALL 2 REQUIRED COURSES						
<p><b>REQUIRED CREDITS: 13.5</b></p> <p>OMM 500D: Project Management <i>3 credits (may be take in Fall 1 or Fall 2 semesters)</i></p> <p>OMM 561: Introduction to Python &amp; Data Science <i>3 credits</i></p> <p>MGT 560F: Professional Business Communication <i>1.5 credits (pass/fail course)</i></p> <p>OMM 521: Operations Platform Seminar <i>0 credit</i></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Fall A</b></p> <p>OMM 576: Foundations of SC Management <i>1.5 credits</i></p> <p>OB 561: Negotiation &amp; Conflict Management <i>1.5 credits (may be taken in Fall 2)</i></p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Fall B</b></p> <p>DAT 500N: Prescriptive Analytics <i>1.5 credits</i></p> <p>OMM 577: IT &amp; Supply Chain Management <i>1.5 credits</i></p> </td> </tr> </table>	<p><b>Fall A</b></p> <p>OMM 576: Foundations of SC Management <i>1.5 credits</i></p> <p>OB 561: Negotiation &amp; Conflict Management <i>1.5 credits (may be taken in Fall 2)</i></p>	<p><b>Fall B</b></p> <p>DAT 500N: Prescriptive Analytics <i>1.5 credits</i></p> <p>OMM 577: IT &amp; Supply Chain Management <i>1.5 credits</i></p>	<p><b>REQUIRED CREDITS: 16.5</b></p> <p>OMM 500F: Advanced Topics in Logistics &amp; Supply Chain Management <i>1.5 credits</i></p> <p>OMM 554: Operations Analytics <b>3 credits</b></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Spring A</b></p> <p>ACCT 502: Managerial Control Systems <i>1.5 credits</i></p> <p>MGT 558: Managing the Innovation Process <i>1.5 credits</i></p> <p>OB 565: Leading Change <i>1.5 credits</i></p> <p>OMM 500M: Supply Chain Analytics – Stochastic Models <i>1.5 credits</i></p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Spring B</b></p> <p>OMM 500E: Supply Chain Risk Management <i>1.5 credits</i></p> <p>OMM 572: Lean &amp; Six Sigma for Process Improvement <i>1.5 credits</i></p> <p>OMM 573: Operations Management in the Service Industry <i>1.5 credits</i></p> <p>OMM 559: Managing Global Business Process Outsourcing for Competitive Advantage <i>1.5 credits</i></p> </td> </tr> </table>	<p><b>Spring A</b></p> <p>ACCT 502: Managerial Control Systems <i>1.5 credits</i></p> <p>MGT 558: Managing the Innovation Process <i>1.5 credits</i></p> <p>OB 565: Leading Change <i>1.5 credits</i></p> <p>OMM 500M: Supply Chain Analytics – Stochastic Models <i>1.5 credits</i></p>	<p><b>Spring B</b></p> <p>OMM 500E: Supply Chain Risk Management <i>1.5 credits</i></p> <p>OMM 572: Lean &amp; Six Sigma for Process Improvement <i>1.5 credits</i></p> <p>OMM 573: Operations Management in the Service Industry <i>1.5 credits</i></p> <p>OMM 559: Managing Global Business Process Outsourcing for Competitive Advantage <i>1.5 credits</i></p>	<p><b>REQUIRED CREDITS: 3</b></p> <p>OMM 500D: Project Management <i>3 credits (may be take in Fall 1 or Fall 2 semesters)</i></p> <p>OMM 558: Advanced Operations Strategy <i>3 credits</i></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Fall A</b></p> <p>OB 561: Negotiation &amp; Conflict Management <i>1.5 credits (if not taken in Fall 1)</i></p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Fall B</b></p> </td> </tr> </table>	<p><b>Fall A</b></p> <p>OB 561: Negotiation &amp; Conflict Management <i>1.5 credits (if not taken in Fall 1)</i></p>	<p><b>Fall B</b></p>
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<p><b>FALL OR SPRING RECOMMENDED ELECTIVE COURSES</b></p>								
<p><b>ELECTIVE CREDITS: 1.5</b></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>DAT 560G: Database Design &amp; SQL <i>1.5 credits*</i></p> <p>DAT 500S: Machine Learning for Prediction of Business Outcomes <i>3 credits*</i></p> </td> <td style="width: 50%; vertical-align: top;"> <p>OMM 531: Supply Chain Finance <i>1.5 credits</i></p> </td> </tr> </table>			<p>DAT 560G: Database Design &amp; SQL <i>1.5 credits*</i></p> <p>DAT 500S: Machine Learning for Prediction of Business Outcomes <i>3 credits*</i></p>	<p>OMM 531: Supply Chain Finance <i>1.5 credits</i></p>				
<p>DAT 560G: Database Design &amp; SQL <i>1.5 credits*</i></p> <p>DAT 500S: Machine Learning for Prediction of Business Outcomes <i>3 credits*</i></p>	<p>OMM 531: Supply Chain Finance <i>1.5 credits</i></p>							
<p><b>TOTAL CREDITS: 36</b>      Required: <i>34.5</i>      MSSCM Elective: <i>1.5</i></p>								
<p><b>EXPERIENTIAL LEARNING REQUIREMENT</b></p> <p><b>COMPLETE 1 COURSE:</b></p> <p>OMM 501P: Boeing Center Practicum Project <i>1.5 credits**</i></p> <p>MGT 501V: Applied Problem Solving for Orgs <i>1.5 credits</i></p> <p>MGT 551E: Internship, Business, &amp; Application <i>1.5 credits</i></p> <p><small>* Elective courses offered either in Fall or Spring semesters ** OMM 501P: Boeing Center Supply Chain Practicum can occur during Fall or Spring semesters based on project availability and student interest.</small></p>								

**Academic Year 2021-2022** The degree requirements in this document apply to students entering Washington University during the 2021–2022 academic year.

Under the flat tuition rate, students may take up to 18 credits per semester. Additional credits must be approved and are charged at the per credit rate.

Every effort is made to ensure that the information is accurate and correct as of the date of publication (5/7/21). Washington University reserves the right to make changes at any time without prior notice.

Therefore, this curriculum document may change from time to time without notice. The governing document at any given time is the then-current version, as published online.



# Master of Science in Supply Chain Management (MSSCM) Course Descriptions

## Foundations Requirements (over and above the 36 MSSCM credits)

### ACCT 560 Introduction to Accounting

We will study the three fundamental financial accounting issues, including (1) recognition, (2) measurement/valuation, and (3) classification/disclosure and consider how business transactions are reflected on the financial statements using generally accepted accounting principles (GAAP). We will cover the four primary financial statements (balance sheet, income statement, statement of stockholders' equity, and statement of cash flows), the supporting footnotes to these statements, and several reports (annual reports, proxy statements, and press releases). The course incorporates both a preparer's perspective (i.e., GAAP requirements for recording and presenting financial information) and a user's perspective (i.e., how an investor or analyst can interpret and use financial statement information). Graded Pass/Fail.

### FIN 510 Introduction to Finance

The main topics to be covered are (1) principles of investments, (2) financial analysis of corporate projects, (3) cost of capital, and (4) capital structure and financing policies. The objective of the company is assumed to be shareholder value maximization. Shareholder value is created by earning more than the cost of capital. The cost of capital is an opportunity cost – what investors could expect to earn on comparable investments in the financial markets. To understand the cost of capital, we need to understand the viewpoint of investors. Furthermore, to understand whether a project earns more than the cost of capital, we need to know how to estimate and discount project cash flows. So, the first three topics are closely connected. The main question in the fourth topic is whether we can create shareholder value through the financial structure of the firm. For example, we will ask whether we can lower the cost of capital by financing with debt instead of equity, or vice versa. Graded Pass/Fail.

### OMM 510 Operations Management Foundations

This required course discusses the main principles and concepts in managing operations for competitive success. Among the topics covered are: Operations strategy, capacity analysis and organization, queuing theory, service management, quality management, inventory management, and a brief introduction to supply chain management. Students learn the basics of how to manage the operations of a firm, with the main goal of this course being to prepare students for advanced coursework in operations and supply chain management, beginning in the Fall A term. Most sessions consist of in-depth case discussion, integrated with theory. Letter-graded. 2 Credits.

## Fall Semester (12 Credits)

### OMM 576 Foundations of Supply Chain Management

Examines how companies manage effectively the entire set of activities involved in the production and delivery of goods and services to their customers. Supply chain management (SCM) deals with the management of materials, information, and financial flows in networks consisting of suppliers, manufacturers, distributors, and customers. Recent trends in communication technology, sophisticated information systems, globalization of operations and markets, increased demand for mass customization, and increasing customer expectations have made the coordination and integration of these flows within and across companies critical to the success of businesses. This course focuses primarily on the foundations of SCM, touching topics such as: 1) matching supply with uncertain demand, 2) inventory management, 3) logistics, 4) design for variety, 5) global issues in SCM, 6) Quick/Accurate Response, 7) collaborative processes. 1.5 Credits.

## **OB 561 Negotiation and Conflict Management**

Managers spend the majority of their time negotiating - from negotiating schedules and vacation time to negotiating resource allocations to negotiating mergers and major policy decisions and their implementation. Skillful negotiation is a critical component of the toolbox of the successful manager. The purpose of this course is to improve students' abilities to diagnose conflict situations, to analyze, plan, and conduct negotiations. The course material addresses negotiation as an effective means for implementing decisions and strategies and resolving conflict in a variety of settings. Course format will involve simulated negotiation and experiential exercises, cases, discussion, and lecture. Students will be evaluated on the basis of case analysis, negotiating performance, a final project, and participation. Students are expected to participate in all negotiation exercises. 1.5 Credits.

## **OMM 500D Project Management**

Change management has become synonymous with project management, since organizations that want to change their focus or direction increasingly recognize that introducing new products, processes, or programs in a timely and cost effective manner requires professional project management. This course analyzes complex projects and discusses available tools for managing them. Some of the topics covered include life cycle models, project selection, project monitoring and control, planning with uncertainty, project risk management, the critical chain method, and managing multiple projects. It also discusses commercial project management software and how to overcome its limited functionality to address the requirements of managing risky complex projects in practice. Students learn project management skills that will be useful throughout their careers. As such, this course is essential for current or future managers regardless of their career concentration. 3 Credits.

## **OMM 501. Operations and Supply Chain Management Platform Practicum**

Students work in small teams on an operations and/or supply chain related consulting project for a client organization, applying insights from their course work to real-world business problems under supervision of both a faculty advisor and a client project lead. Each student is expected to spend about 150 hours on the project. Grades are based on the quality of the project work and the final deliverables (e.g., written and oral reports), as determined by the faculty advisor and client project lead. 1.5 Credits.

## **OMM 561 Intro to Python and Data Science**

This is a 3-credit course offered to MSSCM students. It provides students the necessary skill to set to extract reliable insights from large datasets prevalent in supply chain management. In this course, students will develop basic tools to acquire, clean, and analyze supply chain data, which they will then use to improve decision-making processes. Throughout the course, students will use Python programming language, which is very effective for data manipulation, reporting, and complex optimization. Topics covered include current multi-source data collection technology used in supply chain management, how to transform data into analyzable formats, how to generate static and interactive data visualizations to gain supply chain insights, and predictive analytics in supply chain management-with emphasis on machine learning models for demand forecasting and inventory management optimization. 3 Credits.

## **MGT 560F Professional Business Communication**

Communication is the process of sending and receiving messages, however, communication is effective only when the message is understood and when it stimulates action or encourages the receiver to think in new ways. This course will introduce students to fundamental best practices in business writing and business speaking that will ensure effective communication. Students will participate in activities that will develop professional business communication skills in both writing and speaking, such as: preparing, writing, and delivering presentations, composing clear, concise business messages in a variety of formats, understanding

emotional intelligence to reach the audience and utilizing critical thinking as a basis for communication strategies. Graded pass/fail. 1.5 Credits.

### **OMM 500N Prescriptive Analytics**

This course covers optimization models and tools as they apply to the design and analysis of supply chains. Production planning, distribution, network design, and revenue management problems are covered using the methods of linear, non-linear, and integer programming. Upon successful completion of this course, students will demonstrate competency in formulating and solving supply chain optimization models of real-life complexity using state-of-the-art software. They will become proficient with industrial strength software tools like AMPL and Gurobi alongside Excel's Solver. The course emphasizes proficiency in model-building and using software tools rather than theory. 1.5 Credits

### **OMM 577 IT & Supply Chain Management**

Recent developments and breakthroughs in information technology have radically changed the business world, offering opportunities not only for new products and services also for reengineering supply chains and improving supply chain performance. The course will study how the innovations in information technology affect the ways information flows through the supply chain, which in turns provide opportunities to better coordinate the material and financial flows. The course will review business cases in which companies use supply chain management concepts and emerging technologies to improve business processes as well as creating values. 1.5 Credits.

## **Spring Semester (18 Credits)**

### **ACCT 502 Managerial Control Systems**

Organizations face both information and incentive problems, usually simultaneously. Managerial control involves developing policies and systems to cost-effectively minimize these problems while helping the organization achieve its objectives. The course focuses on control issues by analyzing the financial aspects of planning, feedback, and performance measurement. Topics include: responsibility accounting, budgeting, benchmarking, target costing, variance analysis, productivity measures, transfer pricing and optimal design of performance measures. 1.5 Credits.

### **OMM 500M Supply Chain Analytics: Stochastic Models**

This course covers the two key types of simulation models of uncertain events: Monte Carlo simulation and Discrete Event Simulation. The conceptual difference between these simulation methodologies is in their treatment of time. Discrete Event Simulation is used to model dynamic systems where events occur at specified, random, time. In Monte Carlo simulation the timing of events is typically inconsequential. Upon successful completion of this course, students will demonstrate competency in formulating and analyzing stochastic models using state-of-the-art simulation software. They will become proficient with software tools like **Arena** for Discrete Event Simulation and **Crystal Ball** for Monte Carlo simulation. The course emphasizes proficiency in using software tools to analyze models rather than theory. 1.5 Credits.

### **MGT 558 Managing the Innovation Process**

The course takes the perspective that innovation is a core business process associated with survival and growth of the organization, and it should be managed as such. We view innovation broadly as a process of knowledge creation. Innovation creates new possibilities through combining different knowledge sets. This process is multi-stage and takes place under highly uncertain conditions. The course objective is to help develop for our students the needed managerial skills in managing the multi-stage process of innovation. We

focus on the systematic management of innovation processes through careful resource commitment and management of involved uncertainties. 1.5 Credits.

### **OB 565 Leading Change**

This course introduces the concepts of how leaders create and manage change in four domains: developing a strategic vision, designing new structures and processes, aligning individual motivation with organizational culture, and gaining support for the implementation of change. The class approach will include presentations on leadership experiences, case studies of examples of leaders exhibiting specific behaviors, and experiential exercises. It offers participants meaningful opportunities for the development of a portfolio of tools for leading change. 1.5 Credits.

### **OMM 500F Advanced Topics in Logistics and Supply Chain Management**

Fast-changing consumer demand, the Internet and digital technology, growing competitive pressures, and globalization create new opportunities and challenges on how firms can efficiently deliver the right product to the right place at the right time. Practitioners have responded to drastic market changes through various innovative strategies such as supply chain redesign. These challenges have also attracted significant academic attention and inspired new supply chain research. This course focuses on advanced topics in logistics and supply chain management that are of interest to managers, consultants, and researchers. Students will gain exposure to state-of-the-art knowledge about these topics by attending seminar sessions given by both industry and academic speakers. Graded pass/fail. 1.5 Credits.

### **OMM 554 Operations Analytics**

Examines approaches to problems of operations planning and control in various organizational settings. Topics include demand forecasting (data analysis, forecasting techniques, and control of forecasting systems), end-item inventory control (lot sizing, safety stock, and evaluation of systems), and materials requirements planning (master scheduling, shop scheduling, aggregate capacity planning, and systems implementation). 3 Credits.

### **OMM 500E Supply Chain Risk Management**

Many events in the last few years made supply chain managers keenly aware of the multiplicity and diversity of risks affecting them, from fluctuating commodity prices, unstable currencies, hurricanes and earthquakes, fires, terrorist attacks, contaminated material sourced from developing countries, and suppliers going bankrupt in tight financial credit environments. Building a functional supply chain requires careful planning and consideration of a variety of disruption risks, and it is of paramount importance to integrate management of physical flows and financial hedges when dealing with such risks. Companies that effectively manage their supply chain risks enjoy a level of robustness (flexibility) and resilience (disruption-"proof-ness") that affords them significant competitive advantage. This course will develop a comprehensive risk management framework for complex supply chains and introduce students to all needed decision tools for supply management and risk hedging. In addition, it will outline a portfolio of proven strategies to assess, reduce, hedge, and mitigate supply chain risks. 1.5 Credits.

### **OMM 559 Managing Global Business Process Outsourcing for Competitive Advantage**

The growth of global outsourcing of all types of business processes (from manufacturing, to R&D, engineering, call centers, clinical trial tests, IT, Accounting, human resources, etc.) with third party contracting organizations all over the world has been heralded by the popular and academic press as the most important business trend of the last decade. As a result of such strategic trends and actions, it becomes essential to strategically manage the "global business process outsourcing" as a key business process by itself, and thus to hire and train managers that fully understand the tradeoffs, implementation challenges involved, approaches for managing risks, and more importantly, able to manage the business relationships with the third party contracting organizations. The course is intended to provide the fundamental skills to our students so they can become successful, global managers of "virtual" value chains, which when faced with outsourcing decisions,

can competently make them within the context of their firm's strategy, but also effectively execute all aspects of the outsourcing process and manage the outsourcing relationship with their suppliers. There will be a course packet with readings and case studies. 1.5 Credits.

### **OMM 572 Lean & Six Sigma For Process Improvement**

Discusses the theory and practice of quality management in the business world. Covers operations and marketing issues that are typical for manufacturing and service organizations, a cross-functional perspective emphasizing the interactions between the operations and marketing decisions. Topics include quality strategies and competition; organization and incentives for quality enhancement (the approaches of Crosby, Deming, Feigenbaum, Ishikawa, and Juran); quality-function deployment; process mapping; and the role of top management. 1.5 Credits.

### **OMM 573 Operations Management in the Service Industry**

The service industry is of vital importance to today's economy. Through a greater understanding of the design and operation of services, productivity improvements can be achieved which result in real growth. In this course we will analyze both the strategic issues in service management as well as the particular aspects of running firms. We will discuss important issues in the operations of major service providers such as hotels and restaurants, airlines, retailers, financial services, and health care providers. We cover such topics as: service design, capacity and demand management, quality in services, variability and bottlenecks, and revenue management. The course will approach services from an operations management viewpoint, though related aspects of strategy, marketing, technology management and organizations will be discussed. Much of the discussion will focus on case studies and articles. Students will be required to write-up several cases, complete other written assignments, and may be required to take part in a term project. 1.5 Credits.

## **Final Fall Semester (6 Credits)**

### **OMM 558 Advanced Operation Strategy**

This course deals with operations issues having a long-term impact on the corporate strategy, and on the competitive viability of a firm. We develop a general framework for creating and analyzing strategies for managing domestic and international manufacturing and service operations. The strategic decision categories to be examined include product-process technology strategies, facilities, and capacity management, performance measurement, managing quality and productivity, and system design. The course covers productivity measurement, process choice, product profiling, interfaces with marketing, experience costs, process positioning, accounting and financial perspectives, and international operations. It gives equal attention to service operations and manufacturing operations. Emphasis is on the application of systems thinking to case studies and the design of world class operations. It is valuable for students with an operations or general management focus, as well as for finance and marketing students. 3 Credits.