# International Operations And Supply Chain

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**VIEW PROFILE**

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## Syllabus

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| **PROFESSORS** | Pietro De Giovanni |
| **COURSE CODE** | M284 |
| **GENERAL DISCIPLINE (SSD)** | SECS-P/08 |
| **COURSE YEAR** | 2 |
| **SEMESTER** | Primo Semestre |
| **PARTITION OF STUDENTS** | 0 |
| **CREDITS** | 6 |
| **TOTAL WORKLOAD** | 150 |
| **TOTAL LESSON HOURS** | 48 |
| **TEACHING LANGUAGE** | English |

**INSTRUCTIONAL GOALS**

The course of International Operations and Supply Chain seeks to solve real challenges and business problems to understand the market dynamics, identify the key performance indicators to reach a sustainable competitive advantage, engage and attract consumers with appealing products, and use operations management tools achieve efficiency in production, effectiveness with the offered goods, and coordination over the supply chain and the distribution channels. The students will develop an understanding of the operations and the supply chain strategies, considering the consumer's needs, the key performance indicators linked to the consumer satisfaction, and the market forecasts. Therefore, students will learn how to design, plan, operate and control manufacturing, production, logistics and operations systems within the supply chain framework and distribution channel options by complementing operational and logistics skills with the market dynamics. The course requires the use of analytical techniques to develop critical thinking and to sharpen decision making skills. The students will have the opportunity to apply what they are learning in class to practical problems, through the analysis of case studies, projects, and simulations.

**INTENDED LEARNING OUTCOMES**

The course will use an Enquiry-based Learning Approach by means of which the Dublin's descriptors will be performed as follows:

- Knowledge and understanding. The students' background will be enriched by new managerial approaches and strategic devices to perform in terms of operations and supply chain, as well as

marketing strategies and customer satisfaction.

- Applying knowledge and understanding. The acquired knowledge will be applied to case studies and business challenge toward the entire course. Students will be confronted with an Enquiry-based Learning Approach, that is, we will identify a business problem to be solved, create a list of business challenges to be addressed, and use qualitative and quantitative approaches to find proper answers and optimal solutions.

- Making judgements. The adoption of an Enquiry-based Learning Approach will be fundamental to inspire students' capacity to make judgments. During the course, students will be confronted with real business problems, which will be discussed during the class as well as before the class through a flipped class room approach. By the end of the course, the students will be to understand a business problem and be both critical and professional when making their judgments.

- Communication. The course is very interactive. During the on-campus sessions, the students will be engaged in discussing and solving real life problems; during the online sessions the students' engagement will take place by using some simulation tools as well as by a continuous learning approach pursued through digital tools like WordCloud, Pooling, OpenEnded, etc..

- Lifelong learning skills. The course provides both quantitative and qualitative tools within the area of Operations and Supply Chain Management by undertaking both an operational and a marketing perspective. The used tools can be easily applied to other domains, giving then the chance to use the acquired knowledge in a much wider set of applications and frameworks.

Upon completion of the course, students will be able to:

1. Understand operations and supply chain management and establish their fundamental knowledge, e.g. strategy, models, layouts, scheduling, logistics plan, and quality management.

2. Examine the role of operations in any international organization and examine productivity and a system approach to analyzing operations problems.

3. Understand multiple analytical techniques and applications to develop production and logistics systems according to the consumer's needs, the market dynamics, and the distribution channel constraints.

4. Identify the key components of product and service design, and the ways to improve reliability in design decisions.

5. Utilize various models and techniques to model complex production systems.

6. Identify the key variables that decision makers utilize in addressing the production (aggregate) planning within supply chains, using the sales forecasts and managing all exceptions linked to the market.

7. Draw and describe an operational process and explain the information this process provides considering both an operation and a marketing perspective.

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| | 8. Develop an understanding of how operations and supply chain management can provide a competitive advantage in the marketplace, along with customer satisfaction and market fulfillment. |
| **PREREQUISITES** | Basic knowledge in management, statistics, and quantitative methods. |
| **COURSE CONTENTS** | Introduction to International Operations and Supply Chain Management. Strategic layouts and the impact on supply chain decision. Operation scheduling and supply chain implications for forecasting. Master Production Schedule and Material Requirement Planning. Inventory management and supply chain implications. Lot sizing problems. Quality Management. Supply Chain structure and coordination issues. Logistics strategies and Supply Chain Integration. Sustainable Operations and Green Supply Chain Management. Digital Operations and Supply Chain in the era of Industry 4.0 |
| **REFERENCE BOOKS** | Several references will be suggested during the course. These are book chapters, papers, datasets, simulations, games, and business cases.<br><br>The details of these references will be found in the description of each week. |
| **TEACHING METHODS** | Material will be presented by a variety of teaching approaches including lectures, in-class exercises, multimedia cases, short videos, homework, case analysis and presentation, and class discussion of assigned readings and simulations. When possible a cooperative, student-centered learning approach will be undertaken to enable a high level of student involvement. |
| **ASSESSMENT METHOD** | The assessment will be pursued through a final exam, group assignments, and class participation.<br><br>Final exam (30% of the final grade, individual work). All of them will be made up of questions and problems taken from lectures material, case readings, assigned readings and the texts.<br><br>Group assignments (60% of the final grade, group work). Groups will be formed during the course. Each group will work on several deliverables that are detailed during the course, including an Enquiry-based learning project.<br><br>Class participation (10% of the final grade). Your participation in class discussions and activities will make a great contribution to the course success. Your participation will be checked using digital tools through an engaging system. |

**THESIS ASSIGNMENT CRITERIA**

Students are very welcome to pursue their thesis in the area of operations and supply chain with interfaces between marketing and operations.

Students will have to present a proposal that will be carefully assessed. A good proposal is the key to formalize the thesis process.

Two types of thesis projects will be evaluated:

1. Projects suggested by the students, which must be empirical.

2. Projects that the professor is pursuing, for which some datasets will be made available for the students in the area of operations, marketing, sustainability, and digital transformation. Other projects may be available within the X.ite Research Center in Luiss, to pursue both professional projects with companies or empirical works. In the latter case, the thesis will be submitted for publications in international journals. Hereby some examples of recent publications achieved with MSc students:

1. Maranesi, C., & De Giovanni, P. (2020). Modern Circular Economy: Corporate Strategy, Supply Chain, and Industrial Symbiosis. Sustainability, 12(22), 9383.

2. Naclerio, A. and De Giovanni, P. (2021) Improving the operational performance through Logistics, Blockchain, and Omnichannel, International Journal of Production Economics, to appear.

3. Prencipe, M.P. and De Giovanni, P. (2021) The use of Blockchain at Cantina Placido-Volpone. Chapter in the book: Blockchain Technology Applications in Businesses and Organizations, IGI-Global, London.

**EXTENDED PROGRAM AND REFERENCE READING MATERIAL**

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| | Introduction to International Operations and Supply Chain Management.<br><br>In this session, we introduce new concepts and terminologies related to Operations Management and link them to both operational problems and consumers challenges. The session aims at developing students' attitudes to production models, associating real applications of theoretical models in business, and identifying the key drivers of competitive advantage of a production system to achieve operational performance and customer satisfaction. |
| **WEEK 1 / ON LINE AND ON CAMPUS LECTURES CONTENT** | On-campus session: Introduction to Operations Management<br><br>Online session: Introduction to Operations Management<br><br>Reference: Slack, N., Alistair B.J., Johnston, R. and Betts, A. (2013), Operations and Process Management. Principles and Practice for Strategic Impact, Pearson, Third Edition. Chapters #1 and #2.<br><br>Case discussion: New Balance Athletic Shoe, Inc., Harvard Business School, 2012 |
| **WEEK 2 / ON LINE AND ON CAMPUS LECTURES CONTENT** | Strategic layouts.<br><br>This session identifies the best strategic layouts to be implemented to fulfill the supply chain requirements and the distribution channels. Decisions will be related to the placement of departments, work groups within the departments, workstations, and stock-holding points within a production facility. Various formats of layout will be introduced and discussed.<br><br>On-campus session: Layout issues and customer journey<br><br>Online session: Identify the best product and process layouts from an operational and a marketing perspective.<br><br>Reference: Stevenson, W.J. (2012), Operations Management, Theory and Practice, Chapter #6, pp. 234-272. |

Operation scheduling and supply chain implications for forecasting

In manufacturing, scheduling relies heavily on simulation to estimate the flow of work through the system to determine and solve bottlenecks and the related inefficiency. This session introduces several types of scheduling rules to optimize the flow of jobs and adjust it according to the operational context, consumers' demand and the supply chain challenges.

**WEEK 3 / ON LINE AND ON CAMPUS LECTURES CONTENT**

On-campus session: Solving scheduling problems with operational and marketing constraints

Online session: Case discussion and simulation

Reference: Chase et al. (2011). Operations Management for Competitive Advantage, Technical Note 6.662-682.
Case discussion: Baloons Aloha, Operations Management, 2013
Reference: Stevenson (2015). Operations Management: Theory and Practice, Supplement to Chapter #4.

Master Production Schedule and Material Requirement Planning

This session focuses on aggregate operations plan, which translates annual and quarterly business plans into broad labor output plans for intermediate terms to minimize resources. Then, a particular emphasis will be posed to the material requirement planning to solve of issue of matching the demand requirements according to the aggregate planning with balance the market requests with the operational constraints.

**WEEK 4 / ON LINE AND ON CAMPUS LECTURES CONTENT**

On-campus session: Master Production Schedule and Aggregate Planning

Online session: How to make a Master Production Schedule according to the consumers' demand, case discussion

Reference: Stevenson, W.J. (2012), Operations Management, Theory and Practice, Chapter #11, pp. 472-499 and Chapter #12, pp. 508-531
Reference: Bozarth and Handfield (2012), Introduction to Operations and Supply Chain Management Chapter #10

Case discussion: Resource planning at AkshayaPatra, Vasanthapura, IIMB, 2014 from Harvard Business Publishing.

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| | Inventory management and supply chain implications<br><br>This session aims at exploring the operational trade-offs entailed by inventory management and the consequences for the entire supply chain. Deterministic and stochastic models will be introduced in class to identify the optimal inventory policy to adopt considering the market forecast and sales projections. |
| **WEEK 5 / ON LINE AND ON CAMPUS LECTURES CONTENT** | On-campus session: Inventory models<br><br>Online session: Application of Inventory models to marketing and operations problems.<br><br>Reference: Bozarth and Hanfiled (2012). Introduction to Operations and Supply Chain Management, Chapter #13.<br>Reference: Hillier, F. S. (2010). Introduction to operations research. Tata McGraw-Hill Education. (Nineth Edition), Chapter #18 Inventory Theory, Page 828-904. |
| **WEEK 6 / ON LINE AND ON CAMPUS LECTURES CONTENT** | Lot sizing problems<br><br>Session Lot sizing (or batching) in material requirements planning (MRP) is the process of modifying the net requirement quantities before they are translated into planned orders in an MRP system. To take account of the total costs of managing the materials, i.e., holding costs and ordering or setup costs, batch-sizing rules or ordering policies may need to be applied to the net requirements to produce planned orders for the manufacturing or purchasing of items. Various techniques will be compared according to the planning cost as well as considering the possible implications in terms of price and sales.<br><br>On-campus session: Business problems linked to lotsizing issues analyzed from a marketing and an operational point of view.<br><br>On-line session: Applications and case discussions<br><br>Case discussion: Material Requirements Planning at A-CAT Corporation, Ivey, 2012, from Harvard Business Publishing. |

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| | Quality Management<br><br>This session reviews the general subject of total quality management and develops the basic features and concepts of the Six Sigma approach. Quality standards will be reviewed as well as several statistical methods to improve quality in manufacturing companies to increase the customer satisfaction and avoid complaints. |
| **WEEK 7 / ON LINE AND ON CAMPUS LECTURES CONTENT** | On-campus session: Analysis of quality management tools with applications with experiments<br><br>Online session: Analysis of quality management tools with applications with case discussions<br><br>Reference: Chase et al. (2011). Operations Management for Competitive Advantage, Chapter #8. 320-338 and Technical note #8.<br>Case discussion: General Micro Electronics, Inc.: Semiconductor Assembly Process |
| **WEEK 8 / ON LINE AND ON CAMPUS LECTURES CONTENT** | Supply Chain structure and coordination issues.<br><br>This session introduces the problem of selecting the right suppliers when structuring the supply chain relationships and make them operating in a distribution channel. Some quantitative models will be introduced to establish the best supply chain relationships. Afterwards, these relationships will be managed through some agreements and contracts that will allow the supply chain to achieve coordination targets considering consumers' requirements in terms of price, quantity, service, and returning options.<br><br>On-campus session: Supply Chain Management from an operational and a marketing perspective<br><br>Online session: Analysis of the coordination mechanisms to create and manage a Network<br><br>Reference: Cachon (2003). Supply Chain Coordination with contracts.<br>Case discussion: Blockbuster's supply chain coordination issues led to bankruptcy. |
| **WEEK 9 / ON LINE AND ON CAMPUS LECTURES CONTENT** | Logistics strategies and distribution channels<br><br>This session reviews the logistics strategies available in supply chain to connect all supply chain members in a unique network and properly satisfy the consumers. Several techniques will be introduced to construct optimal supply chain networks.<br><br>Online<br><br>Reference: Bozarth and Handfield (2012), Introduction to Operations and Supply Chain Management Chapter #11<br><br>Case discussion: Walmart's Supply Chain |

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| | Supply Chain Network<br><br>This session introduces several quantitative and qualitative techniques to create ad hoc Supply Chain networks. The students will be involved in analyzing a typical case of Walmart and search for the best elements to select partners according to their marketing and operational performance. |
| **WEEK 10 / ON LINE AND ON CAMPUS LECTURES CONTENT** | On-campus session: Supply Chain Network and applications<br><br>Online session: Supply Chain Network and applications<br><br>Case: Walmart https://www.skubana.com/blog/walmart-leading-way<br><br>Reference: Segura, M., Maroto, C., & Segura, B. (2019). Quantifying the sustainability of products and suppliers in food distribution companies. Sustainability, 11(21), 5875. |
| | Sustainable Strategies in Supply Chains<br><br>The current trends of environmental and social responsibility pressures has considerably changed the way firms and supply chain organize their business and satisfy their consumers. Green practices are diffused not only at a firm's level and confined to a specific function but involve all firms partnering in a supply chain. This session aims at describing the mega-trend and its implications. |
| **WEEK 11 / ON LINE AND ON CAMPUS LECTURES CONTENT** | On-campus session: How to deal with problems of Sustainable developments in marketing and operations<br><br>Online session:<br>Analysis of cases and applications<br><br>Reference: Secchi, M., Castellani, V., Collina, E., Mirabella, N., & Sala, S. (2016). Assessing eco-innovations in green chemistry: Life Cycle Assessment (LCA) of a cosmetic product with a bio-based ingredient. Journal of Cleaner Production, 129, 269-281.<br><br>Case discussion: PEG's green and social supply chain.<br><br>Case discussion: Greening Walmart: Progress and Controversy Rebecca M. Henderson, James Weber, 2017 |
| | Digital Operations and Supply Chain in the era of Industry 4.0.<br><br>In this session, we introduce the implications of Digital tools and Industry 4.0 practices on supply chain management. Nowadays, all supply chain members are influenced by web-based information and decisions, signaling and feedback, information retrieval and intelligent processing. This new business trends have deep implications for the supply chain. |
| **WEEK 12 / ON LINE AND ON CAMPUS LECTURES CONTENT** | Reference: M. Ramachandra (2017). Web-based Supply Chain Management and Digital Signal Processing<br><br>Case discussion: Artificial intelligence at IBM, Alibaba and Genuino. |

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| **DOES THE SYLLABUS COVER SUSTAINABILITY TOPICS?** | Yes, Green Supply Chain Management and Sustainable strategies |