

Area description: Operations Management

Operations Management is a multi-disciplinary field that focuses on managing all aspects of an organization's operations to provide products and services. Operations managers apply ideas and technologies to increase productivity and reduce costs, improve flexibility to meet rapidly changing customer needs, enhance product quality, and improve customer service. The concerns of Operation Management range from strategic to tactical and operational levels, which involve *designing, planning* and *managing* the system.

The Operations Management Concentration is designed to prepare students to be leaders in their operations management careers. With the trend in globalization and decentralization, successful management of supply chain requires system thinking and cross-functional skills. The rigorous coursework and curriculum offered by Operations Management faculty at Krannert aim at providing state-of-the-art trainings to ensure the competitiveness of our students.

Recognition: a top ranked program

The Krannert Operations Management option has been recognized for its excellence by every national publication that ranks such options/programs/specialty areas. For example, *2011 US News and World Report* ranked our operations MBA and Undergraduate options #6 and #3;

Operations is a key capability of many Krannert alumni and lands them senior management positions globally. They include CEO and/or Chairman of Wastco, TVS Motors, Wabtec, Fairfield Manufacturing. A survey conducted by Spencer Stuart indicates that for the second year in a row, Operations (31%) was the most popular functional role before becoming CEO, followed by finance (21%) and marketing roles (12%).

Operations careers at Krannert: major employers

Major employers who have hired Krannert students with Operations option in 2011 include:

Full time positions:

<i>Roche Diagnostics</i>	<i>International Paper</i>	<i>Sears Holdings Corporation</i>	<i>Raytheon</i>
<i>Deere & Company</i>	<i>Haliburton</i>	<i>Target Corporation</i>	<i>Baker Hughes</i>
<i>Rolls-Royce Corporation</i>	<i>ArvinMeritor</i>	<i>Amazon</i>	<i>Dell Inc.</i>
<i>Shell Oil Company</i>	<i>Sara Lee Corporation</i>	<i>Cummins Inc.</i>	<i>Bank of America</i>
<i>Acco Brands</i>	<i>TRW</i>	<i>Caterpillar</i>	<i>DowAgroSciences</i>
<i>Johnson & Johnson</i>	<i>Amway</i>	<i>The Goodyear Tire & Rubber</i>	

In addition, the following companies hired interns:

<i>Walmart Stores, Inc.</i>	<i>Emerson</i>	<i>Group Dekko</i>	<i>CP ALL 7-Eleven</i>
<i>Schlumberger</i>	<i>LifeMed Alaska, LLC</i>	<i>Case New Holland</i>	<i>Lands' End</i>
<i>Ford Motor Company</i>	<i>Givaudan</i>	<i>Allison Transmission</i>	<i>Heinz North America</i>
<i>Chrysler Goup LLC</i>	<i>General Electric</i>	<i>Qualcomm</i>	<i>Celanese Chemicals</i>

Typical initial job titles for graduates with Operations Concentration

Procurement agent, Buyer, Supply Chain Planning and Control Leadership Program, Manufacturing Engineering/Quality Engineering Rotational Program, Logistics Analyst, Area Manager, Pathway Operations Manager, Account Manager,

Supply Chain Leadership Development Program, Transportation Planner, Supply Chain Planner, Sr. Consultant, Operations Manager, Innovation Analyst, Operations Consultant.

Operations Faculty: Generating Knowledge

Our operations faculty have written textbooks, research monographs, papers that influence the field. Faculty have also written books for practicing managers.

Our operations faculty have served as consultants for companies in industries ranging from autos, airlines, health care, government, electronics, grocery, apparel and more.

Our faculty have received the Edelman prize – the prize that honors the best applied research in the discipline.

To learn more about our faculty, visit:

<http://www.krannert.purdue.edu/directory/view.asp?search=FacArea&FacAreaList=58>

Requirements for the Option

The Operations core course, MGMT 660 (offered in Module 3), is a pre-requisite for all other Operations courses. 10 elective credit hours (5 classes) are required beyond the core courses from the following set of courses:

Year 1	Module 3	MGMT 660 Operations Management (required)	
	Module 4	MGMT 664 Supply Chain Management MGMT 564 Service Operations Management MGMT 590 Healthcare Operations	
Year 2	Module 1	MGMT 561 Logistics MGMT 565 Strategic Sourcing & Procurement	MGMT661 Experiential Learning in Operations
	Module 2	MGMT 560 Advanced Manufacturing Planning & Control MGMT 562 Project Management MGMT 566 Global Supply Chain Management MGMT 669 Operations: Practice and Models	
	Module 3	MGMT 562 Project Management MGMT 590 Sustainable and Socially Responsible Operations	
	Module 4	MGMT 564 Service Operations Management MGMT 590 Healthcare Operations	

One course may come from the following non-Operations classes:

MGMT522	New Product Design (Marketing)
MGMT572	Tools for Total Quality Management (Quantitative Methods)
MGMT657	Manufacturing Strategy (Strategy)

Sample Course Descriptions

MGMT 660 Operations Management (required)

Course Description As goods and services are produced and distributed, they move through a set of inter-related operations or processes in order to match supply with demand. The design of these operations for strategic advantage, investment in improving their efficiency and effectiveness, and controlling these operations to meet performance objectives is the domain of Operations Management. The primary objective of this course is to

Topics Covered provide an overview of this important functional area of business.

- Process Analysis
- Queueing Analysis
- Inventory Management
- Supply Chain Coordination
- Toyota Production System

MGMT664 Supply Chain Management

Course Description A supply chain includes supply, production, storage, distribution, and selling facilities that are connected by material, informational, and financial links. The goal of Supply Chain Management (SCM) is to maximize the economic value that can be generated by managing the strategic design of such supply network and choice of its capacity; the tactical planning of this capacity and related management of production, inventory, and logistics activities; and the operational control of the flows of materials, information, and money and the stocks of physical goods in this network. This course explores how firms can make better SCM choices using various analytical tools and high-level insights needed by supply chain managers and consultants.

Topics Covered

- Supply Chain Performance
- Network Design and Flexibility
- Transportation
- Sourcing Decisions
- Demand Forecasting
- Supply and Operations Planning
- Coordination and Contracting in Supply Chain
- Risk Management in Supply Chain

MGMT560 Advanced Manufacturing Planning and Control

Course Description Most OM text and courses emphasize planning, which tends to give a somewhat static picture of how a manufacturing system operates. To practice control, requires some mechanism for simulating the execution of plans through time. To this end, the course material revolves around three "active learning modules". Specifically, the course will provide a hands-on experience with 3 fundamental approaches used to control a manufacturing process: the Theory of Constraints (TOC), Material Requirements Planning (MRP), and Just-In-Time (JIT). For each approach, we have either a virtual (i.e. computer simulation) or physical mock manufacturing system in which to implement and execute the concepts. A principal objective of these modules is to not only gain experience planning, but to execute and control a plan. Assignments will be based upon these mock processes and will be done in teams. Cooperation and team-work is essential.

Topics Covered

- Drum-Buffer-Rope Simulation
- MRP in the Mock Factory
- JIT in the Mock Factory

MGMT 561 Logistics

Course Description Competitive logistics uses the effective capabilities of a chain of suppliers across the globe to maximize their performance. But performance metrics include profitability,

sustainability, service etc. This course will focus on understanding successful global companies and learning from their strategies to enhance the competitiveness of your logistics system. We will use a 4 C framework consisting of a focus on chain structure, capacity, coordination and competitiveness to develop this understanding. Specific topics we will focus on mode choice, total logistics costs, core carrier programs, procurement auctions, crossdocking, warehouse management systems. This course will introduce these concepts and applies them to industries ranging from auto, electronics, grocery and apparel manufacturing, to transportation and service parts systems.

This course will use a variety of teaching techniques and methods including: class presentations, discussions and case analysis activities.

Topics Covered

- Introduction to Logistics – 4 C approach and examples, Logistics Audit
- Total Logistics Costs and the Impact of Mode decisions
- The Impact of Warehousing and
- Core Carrier Programs
- Procurement Issues
- Grocery Logistics
- Apparel Logistics
- Humanitarian Logistics

MGMT 562 Project Management

Course Description This course exposes students to unique techniques and strategies for accomplishing specialized missions or work where normal organizational structure or methods are not sufficient. Introduction to Microsoft Project, case studies, text readings, project examples, modeling techniques, and traditional project management tools, prepare students for the in-depth, end of module group project. The Precedence Board Game is used in this class.

MGMT 564 Service Operations Management

Course Description The service sector of the U.S. economy employs about 80% of the labor force and is responsible for approximately 75% of the gross domestic product. There is service component to most manufactured products, for example warranties, handling customer complaints, etc. Given the important role services play in the American and world economies, it is important for a manager to understand how processes in services differ from processes in manufacturing. The following activities are particularly important to services:

- a) The close coordination of operations and marketing (because the same person produces and delivers the service).
- b) The management of quality (because the production and delivery of the service is simultaneous).
- c) The design of work and the selection, development, and motivation of people (because service tasks require varying degrees of customization and contact with customers).

Accordingly, the purpose of this course is to develop, to synthesize, and to apply concepts for designing and managing productive service systems. We will develop and synthesize concepts by studying case scenarios of firms that have achieved long-term profitability and by engaging in several simulation exercises and games. We will build on insights and tools such as Little's Law, Waiting Line Models, the

- Topics Covered*
- Toyota Production System, Six Sigma, and Inventory Models.
- Queuing, Sources of variability, Priority queues
 - Capacity Planning and role of flexibility
 - Reducing errors and variability – Toyota Production System
 - Measuring Efficiency – Data Envelopment Analysis
 - Service Quality
 - Customer Relationship and Revenue Management
 - Serving the customer in the digital age

MGMT565 Strategic Sourcing and Procurement

Course Description With the relentless trend of globalization, procurement has moved from fighting for organizational significance to playing pivotal roles in the success of global firms. In global firms' profit and loss accounts, the share of material cost and the share of purchased services are growing continuously, underscoring the increasing strategic importance of sourcing and procurement management. This course will address the process of procurement including terminology, metrics, and decision making. We will also explore the sourcing decision and the strategic ramifications of producing/providing goods and services internally or purchasing them from external organizations.

- Topics Covered*
- Classification of procurement methods
 - Centralized vs. decentralized of procurement functions
 - Building exclusive long-term supplier relationship vs. multiple sourcing
 - Auction design and e-procurement
 - Bargaining/negotiation
 - Outsourcing (Core/Noncore business activity)
 - Backward integration

MGMT566 Global Supply Chain Management

Course Description Global supply Chain involves the flows of materials and information among all of the firms in different locations that contribute value to a product, from the source of raw materials to end customers. We will integrate issues from marketing (channels of distribution), logistics, and operations management to develop a broad understanding of a global supply chain. By taking a strategic perspective, we will focus on relatively long-term decisions involving the investment in productive resources, configuration of processes, product designs, and development of partnerships with suppliers and channels of distribution. The course seeks to both improve your understanding of global supply chain strategies and enhance your analytical skills. The course will present several analytical techniques which would aid you in making decisions in the real world. In the meanwhile, the course will introduce you various aspects, issues, and initiatives in nowadays business operations.

- Topics Covered*
- Supply chain contracting under exchange risk
 - Operational hedging via selecting capacity portfolio
 - Global product design to mitigate regional demand risks
 - Global product proliferations and its impact on inventory management
 - Mass-customization and global sourcing strategy

- Impact of custom duty and exchange rate on global network design

MGMT 690 Sustainable and Socially Responsible Operations

Course Description Climate change, energy, water and air pollution, waste management and deforestation are some examples of environmental issues faced by humanity. Organizations are paying more attention to these issues that are challenging to address with conventional tools. In this course we are going to learn about state of the art operational and supply chain practices to deal with these issues. Beyond studying approaches to address environmental issues, we will study social responsibility that is the balanced approach for organizations to address economic, social and environmental issues in a way that aims to benefit society. We will explore this concept from a supply chain perspective and for manufacturers, service providers, social entrepreneurs, and NGOs.

Topics Covered

- Environmental legislation
- Pollution prevention
- Sustainable operations
- Remanufacturing
- Closed-loop supply chains
- Operations of the social enterprise
- Nonprofit organizations
- Humanitarian logistics

MGMT 661 Experiential Learning in Operations

Course Description This course focuses on performance excellence in supply chain and operations management, whether it is in an entrepreneurial startup firm, emerging company, or Fortune 500 organization. Students gain knowledge, confidence, and ability to identify, analyze, develop, and implement performance excellence practices. A semester long project is assigned to each student team that is closely supervised by one or two faculty members from Operations Management. The objective of the course is to provide students with a format for reflection while the students perform professional consultancy to address supply chain and operations related issues within an organization. Intended outcomes include:

- a) Opportunities to put the students' academic learning into practice and internalize their classroom learning.
- b) Integrated learning about how specific projects relate to larger business goals.
- c) Enhanced ability to identify and analyze operations issues, and develop implementable solutions.
- d) Increased professional skills including teamwork, client communication, and project management.