



R·I·T | **KATE GLEASON**
College of ENGINEERING

Master of Science in Product Development



Program Overview

RIT's Master of Science in Product Development (MPD) program is a leadership program designed for engineers, scientists, technical managers, and other experienced professionals who aspire to mid- and senior-level positions associated with product innovation. The program integrates business and engineering courses consistent with cross-functional, end-to-end product development and the systems perspective so critical to conceive, create, launch, and support today's complex product portfolios.

Designed by academic and industry leaders, MPD integrates formal education with state-of-the-art research and industrial best practices, to stay on the cutting edge. Electives and a Capstone project provide flexibility to tailor program content to specific learning objectives of students and sponsoring organizations.

Participants acquire the foundation skills and strategic perspective necessary to become future leaders and senior managers responsible for driving business growth through new products. They develop receptiveness to change and continuous improvement, an understanding of the enablers to business success, and an enhanced ability to recognize barriers early in the commercialization cycle when corrective actions are least costly. In short, the MPD program prepares today's technical experts for successful careers as project leaders and technically grounded senior managers of their enterprises.

"Students have found the skills developed through the MPD program not only help them become more marketable, they also foster the self-confidence needed to take on new responsibilities.



The combination of engineering and business coursework provides a broad perspective needed to lead high technology enterprises."

Mark Smith

Director Product Development
Kate Gleason College of Engineering



Curriculum

The 30-semester-credit MPD program consists of 9 business and engineering courses, including one elective, plus a Capstone project (3 credits). The program is offered fully on-line or as a blend of on-line and on-campus graduate courses.

- Excellence in New Product Development (ISEE-781)
- Engineering of Systems I, II (ISEE-771, ISEE-772)
- Systems and Project Management (ISEE-750) or Project Management (BUSI-710)
- Marketing Concepts and Commercialization (MKTG-761)
- Accounting for Decision Makers (ACCT-603)
- Decision and Risk-Benefit Analysis (ISEE-751)
- Operations and Supply Chain Management (DESC-743)
- Product Development Capstone (ISEE-798)
- Elective

Elective course

An elective course offers students the opportunity to better meet personal and organizational needs. Students may select from a long list of courses. Recommended electives include such offerings as Managing Research and Innovation, Supply Chain Management, Lean Six Sigma Fundamentals, Advanced or International Project Management, Breakthrough Thinking and Creativity, Customer Centricity, and others.

Capstone project

Students complete a project during the final academic year of the program, based on a real problem often identified in the companies where they work. The corporate-oriented Capstone project (6 credits) encompasses the broad integrative aspects of new product development – it synthesizes, increases, and demonstrates the student’s understanding of previous program material and underscores the behaviors essential to product development leadership. The Capstone project generates immediate benefits to sponsoring organizations.



Educational objective

To develop a leadership perspective and knowledge base of the total life cycle product development system, integrating management and (systems) engineering elements. To establish the foundation for the systems approach needed to conceive, create, launch, and support products and platforms. The program considers new product development in a larger framework: how a company's business strategy, vision, and core capabilities coupled with the voice of the customer combine to determine product strategy and create best-in-class product portfolios.

Program competencies

- Leadership expertise of the product development process and of high-performing product development teams and organizations.
- Improved leadership through structured systems thinking, design, and management.
- A strategic, enterprise-wide and global perspective.
- An innovative mindset receptive to changing markets, new technologies, and new opportunities.
- Decision making in uncertain and fast-paced environments.
- A market-oriented product development focus – i.e. the ability to transform customer problems, needs, and market opportunities into successful product portfolios.
- Economic analysis and the application of sound business principles to effective management in the product development domain.
- Project management: business and technical planning, relationship management and outsourcing, program control, structured decision making and risk management.
- Enhanced ability to recognize barriers to success early, when corrective actions are less costly.
- In-depth understanding and application of state-of-the-art tools for design, analysis, and management in the product development domain.

Embedded engineering competencies

The product development leader must apply “engineering” competencies to the development of strategic product architectures that relate to the business value chain of the corporation, to the integration of enabling technologies, and to the creation of realizable design concepts. These capabilities are supported by:

- The ability to assess the merits and risks associated with emerging technologies.
- The ability to create products with acceptable product liability, life cycle cost, and environmental impact.
- The ability to create products consistent with manufacturing and supply chain capabilities.
- The ability to coordinate the product architecture with organizational structure.
- The ability to select which competencies are core to the business and which can be outsourced.
- The ability to create and implement an organization's decision processes.
- The ability to identify and implement enabling technologies and tools.



Course Descriptions

Core Courses

Excellence in New Product Development (ISEE-781)

Success in today's competitive global economy depends substantially on a firm's ability to define, develop, and introduce outstanding new products more efficiently and effectively than its competitors. This course introduces students to best practices and attributes of world-class product development leaders and organizations. Critical success factors and inhibitors to the commercialization of complex products and systems are discussed, along with state-of-the-art methodologies, processes, and tools. Emphasis is placed on the role of the product development manager in leading product strategy, high performing product development teams, and transformational initiatives essential to competitiveness (3 credits).

Engineering of Systems I (ISEE-771)

The engineering of a system is an essential aspect of its development that focuses on the overall concept, performance requirements and behavioral aspects of the system. This course treats the creation of products, product platforms and product families as systems that create value for both the customer and the enterprise. Topics include value creation and strategy, product development processes, translating market requirements to system requirements, functional analysis, development of the system's architecture, development of platforms and modules, concept generation and selection, design for "X" (manufacturing/assembly/service/environment, etc.) and life cycle costing. Students will learn several systems analysis techniques and apply them in a team-based project (3 credits).

Engineering of Systems II (ISEE-772)

The engineering of a system is an essential aspect of its development that focuses on the overall concept, performance, requirements and behavioral aspects of the system. This course builds on the concepts discussed in Engineering of Systems I. Topics include outsourced product development, critical parameter management, robust design and latitude development, quality by design, innovation techniques, sustainable design, and lean product development. Students will learn several systems analysis techniques and may include a team project (3 credits).

Systems and Project Management (ISEE-750)

Systems and Project Management ensures progress toward objectives, proper deployment and conservation of human and financial resources, and achievement of cost and schedule targets. The focus of this course is on the utilization of a diverse set of project management methods and tools. Topics include strategic project management, project and organizational learning, cost, schedule planning and control, structuring of performance measures and metrics, technical teams and project management, information technology support of teams, risk management, and process control. Course delivery consists of lectures, speakers, case studies, and experience sharing, and reinforces collaborative project-based learning and continuous improvement (3 credits).



Foundation Courses

Marketing Concepts and Commercialization (MKTG-761)

An introduction to contemporary principles and practices of marketing. The course is structured around the process of marketing planning leading to the development of successful marketing strategies, including the commercialization of products and services in domestic and international environments. Focus is on environmental scanning techniques, setting and evaluating measurable objectives, innovating and controlling the interrelated components of product/service offerings, planning and executing the marketing mix (channels of distribution, price, and promotion), and enhancing customer relationships through the delivery of customer value (3 credits).

Accounting for Decision Makers (ACCT-603)

A graduate-level introduction to the use of accounting information by decision makers. The focus of the course is on two subject areas: (1) financial reporting concepts/issues and the use of general-purpose financial statements by internal and external decision makers; and (2) the development and use of special-purpose financial information intended to assist managers in planning and controlling an organization's activities. Generally accepted accounting principles and issues related to International Financial Reporting Standards are considered while studying the first subject area and ethical issues impacting accounting are considered throughout (3 credits).

Decision and Risk-Benefit Analysis (ISEE-751)

This course addresses decision making in the face of risk and uncertainty. Various methodologies will be introduced that are useful in describing and making decisions about risks, with particular emphasis on those associated with the design of products. Students will be exposed to issues related to balancing risks and benefits in situations involving human safety, product liability, environmental impact, and financial uncertainty. Presentations will be made of risk assessment studies, public decision processes, and methods for describing and making decisions about the societal risks associated with engineering projects. Topics include probabilistic risk assessment, cost-benefit analysis, reliability and hazard analysis, decision analysis, portfolio analysis, and project risk management (3 credits).

Operations and Supply Chain Management (DESC-743)

Study of the management of operations and supply chain management. Encompasses both manufacturing and services. Topics include operations and supply chain strategy, ethical behavior, forecasting; work systems, inventory management, capacity and materials planning, lean operation, supply chain design and closed-loop supply chains, global operations, quality management, quality control, and quality improvement, project management, and current issues. (3 credits).



Capstone course

Product Development Capstone (ISEE-798)

Students in the program must demonstrate intellectual leadership in the field of new product development. The general intent of the Capstone is to demonstrate the students' knowledge of the integrative aspects of new product development in the context of a corporate-oriented problem solving research project. The project should address issues of significance to multiple functions or disciplines and should draw upon skills and knowledge acquired from various courses and experiences in the program. Students are encouraged to start work on the project in advance of receiving formal credit. Team-based projects are strongly recommended. (Prerequisite: completion of 50% of coursework in the MPD program).

Elective course

A few examples are provided below. Students may select from a much broader list of graduate courses – descriptions and titles are available upon request.

- Managing Research & Innovation (MGMT-761)
- Supply Chain Management (ISEE-703)
- Lean Six Sigma Fundamentals (ISEE-682)
- Advanced Project Management (BUSI-711)

Admission

Candidates should have an undergraduate degree in engineering or a related scientific or technical field with a minimum GPA of 3.0, and at least two years experience directly related to product development. No graduate entrance exam is required. Applications can be submitted to RIT at any time – admission is on a rolling basis.

Program cost

The MPD program is priced at RIT's part-time graduate tuition rate (<https://www.rit.edu/fa/sfs/>), currently \$1,815 per credit or \$54,450 for the entire 30 credit program. Students may qualify for financial aid, usually in the form of low-interest loans. Visit the financial aid website at <http://www.rit.edu/emcs/financialaid/graduate.html> or call (585) 475-2186 for information and assistance.

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