

SYLLABUS

EGR 507 and EM 507: Life Cycle Product Management

Spring 2025 – Monday 4:30–7 in EB2 1230 and Online

Course Overview

Are you ready to master the strategies that drive a product's success long after its launch? *Life Cycle Product Management* equips you with the dynamic tools and techniques needed to lead complex, high-tech products through every phase of their life cycle—from introduction to maturity and beyond. In this action-packed course, you'll gain the insights, skills, and frameworks to think like an engineering manager and problem-solve in real-world scenarios.

We focus on what happens after the launch—because sustaining and evolving a product is where leaders thrive. You'll learn how to manage customer expectations, oversee product evolution, and adapt to competitive and market disruptions, all while balancing technical challenges with business priorities. Through engaging **case studies**, interactive team exercises, and practical applications, you'll tackle critical topics like market segmentation, pricing strategies, manufacturing, outsourcing and supply chain, technical support, and service design—all the elements that make or break a product's success.

This course adopts a **systems-thinking approach**, providing you with a 360° view of product life cycle management. Whether you're leading a new product, navigating upgrades, or strategizing a response to disruptive competitors, you'll leave with actionable skills you can apply immediately in any engineering or technology role.

This course covers the management of complex technical products during all product life cycle phases, but primarily after the product has been launched into the market (EGR 590-608 / EM 589-002 Managing New Product Creation covers the product launch). It is a broad survey of all the tools needed by the technical product manager throughout the life cycle of a complex product. The course is taught with a systems approach and from the engineering manager's viewpoint.

The product life cycle includes all aspects of managing products from launch through maturity. The course covers understanding customer needs, product design and packaging, market segmentation, pricing, sales and distribution, technical sales support, training, technical services and support, product evolution and upgrades, and disruption management. A particular emphasis is placed on the need for complex high-technology products and related engineering services. Business topics are covered as necessary to meet the needs of the engineering manager. Case studies are used extensively throughout this course. Students are expected to learn good communication skills.

This course is part of a two-course series in Product Management (EGR 590-608 Managing New Product Creation, and EGR 507 Product Lifecycle Management). The courses may be taken in either order, or you may just take one course. Students who take both courses can use the same product for the course project in each, resulting in a design and development plan, business plan, and product management plan for the product. Each course is self-contained, however.

This course is offered in two formats: 1) In-class/hybrid, and 2) fully online/asynchronous. Both formats cover the same content but in a slightly different manner. In-class sections hear lectures live and work in small groups on the case studies. Fully online sections will view the lectures online and will complete case studies in the forum with others. Case studies result in a 5-slide deck for each team. Both in-class and online students will be asked to engage in conversation in the forum on current topics. Grading will be identical in both in-class and online sections.

Why Take This Course?

- **Learn by Doing:** Work on real-world case studies and create actionable 5-slide product strategies that mirror industry expectations.
- **Bridge Engineering and Business:** Master essential business concepts—like ROI analysis and life cycle costs—through the lens of technical management.
- **Flexible Learning:** Choose between live, in-person collaboration or asynchronous, fully online learning—both formats ensure you get the same rigorous, engaging experience.
- **Build Your Portfolio:** If you're taking the *New Product Creation* (EGR 590-608) or *Product Lifecycle* courses as a series, you'll create a full-fledged product strategy from concept to end-of-life management.

By the end of this course, you'll be empowered to lead teams, drive product performance, and ensure the long-term success of even the most complex technologies.

Who Should Enroll?

This course is perfect for graduate students with an engineering or science background who are ready to:

- Transition from an individual contributor role to a technical leader or product manager.
- Understand the business of engineering and learn how to balance cost, quality, and customer satisfaction.
- Explore agile approaches to product evolution and master real-world problem-solving.

Course Topics

This course dives deep into the tools and strategies needed to manage technical products throughout their life cycles. Topics include:

- **The Product Lifecycle Model:** See how products evolve from market entry to decline—and learn how to manage each phase.
 - **Understanding the Customer:** Use data, user insights, and surveys to define what customers really want.
 - **Dynamic Product Teams:** Build and lead cross-functional teams that innovate, communicate, and deliver results.
 - **Agile Product Management:** Discover agile principles for evolving products to meet changing markets and customer needs.
 - **Market Positioning and Pricing:** Learn the art of differentiating your product while maximizing value.
 - **Sales and Distribution Strategies:** Develop plans to take your product to market and support it throughout its life cycle.
 - **Technical Service and Support:** Manage customer support systems, training programs, and warranties for high-impact results.
 - **Managing Disruption:** Respond quickly to competition, innovation, and market challenges with a proactive mindset.
 - **Product ROI and Cost Management:** Use life cycle cost analysis and ROI calculations to make sound decisions that balance growth with profitability.
 - **PLM Tools and Software:** Explore cutting-edge Product Lifecycle Management (PLM) tools used by industry leaders
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Learning Experience

In-Class & Hybrid Students:

- Collaborate with peers on live, interactive case studies and strategy development
- Engage in group activities that prepare you to tackle leadership challenges

Fully Online Students:

- Stay fully engaged through interactive forums and online group projects.
- Share insights, and develop strategies through discussions and team-based work.

All Students:

Expect to create clear, compelling 5-slide strategic briefs for each case study—a critical skill for influencing stakeholders as a product manager or engineering leader.

Course Prerequisites

Graduate standing with a degree in engineering, science, or a related technical field.

Are you ready to take charge, evolve products, and drive lasting success? Let's get started—*EGR 507 is where leaders are made.*

Instructor Informaiton

Ed Addison

Adjunct Lecturer, Systems and Industrial Engineering

eraddiso@ncsu.edu (preferred method of communication)

Cell: 910-398-1200

Bio can be found on LinkedIn: /edaddison/

Appointments for **Zoom meetings** can be scheduled by emailing the instructor at eaddiso@ncsu.edu.

Regular availability: **Wednesday afternoons/early evenings**, or other times by arrangement

Textbooks

Grieves, M. (2006). *Product lifecycle management: Driving the next generation of lean thinking*. McGraw-Hill Education. **ISBN: 978-0071452304** \$30

Haines, S. (2019). *The product manager's survival guide: Everything you need to know to succeed as a product manager* (2nd ed.). McGraw-Hill Education. **ISBN: 978-1260143478**. \$23

Haines, S. (2021). *How to create a business case* (Business Acumen How to Guides). Business Acumen Institute. **ISBN: 979-8782199722**. \$12

Haines, S. (2024). *Product strategy and roadmapping: A guided tour through the strategic planning process for product managers* (Product Management Professionals). Business Acumen Institute. **ISBN: 979-8877546554**. \$20

Course Format

This course primarily uses a case-study approach, providing immersive, real-world learning experiences in product management. Weekly coursework—whether for online or in-class students—includes five key components:

1. A **60-minute content presentation** on the case and underlying product management principles.
2. **50–60 pages of readings** assigned per week, more in the first month
3. A **case planning meeting** with your team.
4. Active participation in **classroom and/or forum discussions** about the case with your team and instructor.
5. Preparation, delivery, and engagement in **case study presentations and commentary** in alternate weeks during the case study period of this course.

The course begins with an introductory **four-week period** covering foundational product management principles, supported by extensive reading and culminating in a graded online quiz. An **individual final paper** is required at the end of the course, allowing students to apply concepts to a product of their choosing.

- **Campus Sections:** These hybrid sections include in-person instruction, group case presentations, and class discussions. Attendance is mandatory. Team coordination and presentations occur in class, while forum discussions, readings, case preparation, and the quiz take place online.
- **Online Sections:** These sections are fully online, with recorded weekly lectures posted by Monday night on Panopto and linked in Moodle by Tuesday morning. Students deliver case presentations by submitting MP4 video recordings.

Follow the weekly course schedule carefully. A weekly announcement will summarize tasks and deadlines.

Course Project

Individually, each student will complete a **Product Management Plan (PMP)**—also referred to as a **Product Masterplan**—for a product of their choosing that aligns with their job or academic interests. This comprehensive plan must cover:

1. A **business case proposal** for the chosen product halfway through the course.
2. A **10-page final paper** detailing the complete Product Management Plan.

Further guidelines and requirements for the project can be found under “Course Documents” in Moodle.

Detailed Course Outline

Module 1: Kickstarting Your Product Management Journey

- *Course Introduction*: Unpack the course structure, goals, and expectations.
 - *The Product Manager's Role*: Discover the dynamic responsibilities of product managers and their impact on engineering management.
 - *Why Product Life Cycle Management (PLM) Matters*: Explore how PLM drives innovation and success throughout a product's lifespan.
 - **Reading:**
 - Grieves (2006): Chapters 1-2
 - Haines (Survival Guide) (2019): Chapter 1
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Module 2: Mastering Product Life Cycle Management and PLM Tools

- *What is PLM?* Understand the foundational framework and processes of Product Life Cycle Management.
 - *Tech Tools of the Trade*: Hands-on overview of leading PLM software, tools, and platforms.
 - *PLM in Action*: See how PLM integrates into engineering management to streamline workflows and enhance product outcomes.
 - **Reading:**
 - Grieves (2006): Chapter 3
 - Various Websites and Articles on PLM Software
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Module 3: Designing Winning Product Strategies

- *Strategic Planning Across Stages*: Learn how to guide a product through growth, maturity, and decline phases.
- *Market and Competitor Analysis*: Develop critical skills to evaluate market trends and outsmart the competition.
- *Stand Out in the Crowd*: Master positioning and differentiation to create irresistible product value.
- **Reading:**
 - Haines (2024): *Product Strategy and Road Mapping – Entire Book*

Module 4: Crafting a Powerful Business Case

- *Building the Business Case*: Identify a compelling case's key components that get buy-in.
 - *Financial Forecasting Made Simple*: Learn to forecast revenue, assess risks, and measure ROI.
 - *Interactive Challenge*: Test your knowledge with an Online Quiz (20 multiple-choice questions, open-book, 40 minutes).
 - **Reading:**
 - Haines (2021): *How to Create a Business Case* (entire book)
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Module 5: Driving Sales and Marketing Success

- *Lifecycle Marketing Mastery*: Unlock techniques to optimize sales strategies at every product stage.
 - *Channels, Pricing, and Segmentation*: Learn how to target the right audience with the right approach.
 - *Case Study 1*: Tesla Cyber Truck | Innovative, market-changing strategies in action.
 - *Group Project*: Prepare for Case Study 1 presentations (due Week 6).
 - **Reading:**
 - Haines (Survival Guide) (2019) Chapters 5-6
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Module 6: Tesla Case Study Showdown

- *Group Presentations*: Deliver engaging 5-slide, 10-minute team presentations.
 - *Classroom Insights*: Participate in a collaborative feedback session to sharpen your analysis.
 - **Reading:**
 - Case Study Document
 - Outside articles on Tesla Cyber Truck
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Module 7: Elevating Customer Service and Support Strategies

- *Support That Wins Loyalty*: Discover best practices in customer service, warranty management, and training.
- *Case Study 2*: Medtronic | Learn how world-class customer training elevates product adoption.

- *Group Project:* Prepare for Case Study 2 (Medtronic Smart Insulin Pen and Guardian Glucose Monitor) presentations (due Week 8).
 - **Reading:** Case Study Document and Assigned Articles
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Module 8: Medtronic Case Showdown

- *Group Presentations:* Showcase your findings with concise, impactful presentations.
 - *Peer Learning:* Dive into a lively discussion and feedback session.
 - **Reading:**
 - Outside articles on Medtronic's customer service strategies.
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Module 9: Outsourcing, Supply Chain, and Manufacturing Excellence

- *Outsourcing Decisions:* Learn to evaluate and manage outsourcing and supplier partnerships.
 - *Tackling Supply Chain Risks:* Analyze strategies to mitigate disruptions and optimize manufacturing processes.
 - *Case Study 3: Boeing 787 | Complex supply chains and global challenges.*
 - *Group Project:* Prepare for Case Study 3 presentations (due Week 10).
 - *Business Case for Final Project:* DUE
 - **Reading:** (for next two weeks)
 - Assigned Articles on Supply Chain
 - Assigned Articles on Outsourcing
 - Assigned PDF Chapter on Manufacturing
 - Boeing 787 case Document
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Module 10: Boeing 787 Case Study Debrief

- *Group Presentations:* Share actionable insights and lessons learned.
 - *Collaborative Discussion:* Reflect on supply chain risks and solutions.
 - Extensive Discussion of Manufacturing and the Product Manager's Role
 - **Reading:**
 - The same readings continued from Module 9
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Module 11: Logistics, Maintenance, and End-of-Life Strategy

- *Optimizing Product Logistics*: Learn to streamline distribution and post-launch operations.
 - *Sustainable Product Retirement*: Explore environmentally friendly and cost-effective end-of-life strategies.
 - *Case Study 4: Northrop Grumman APG-68 Radar for F-16* | Innovative end-of-life planning in defense systems.
 - *Group Project*: Prepare for Case Study 4 presentations (due Week 12).
 - **Reading:**
 - Outside Articles on: *Logistics, Maintenance*
 - Case Document for Northrop Grumman APG-68 Radar
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Module 12: Northrop Grumman APG-68 Radar Case Study Insights

- *Group Presentations*: Demonstrate your expertise with polished presentations.
 - *Interactive Reflection*: Engage in collaborative class feedback.
 - **Reading:**
 - Outside articles on end-of-life strategies for defense systems.
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Guest Speaker

- *Guest Speaker to Present Product Management at a Specific Organization*
 - **Reading:**
 - As recommended by the guest speaker
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Module 13: Mastering the Complete Product Lifecycle

- *Integrating What You've Learned*: Connect the dots across the product lifecycle and PLM strategies.
- *Your Career Roadmap*: Explore exciting career paths in product management.
- *Staying Ahead*: Plan for continuous learning and professional growth.
- *Participation Report*: DUE
- **Reading:**
 - Nanda (2019): Chapter 11: *Continued Growth and Success*
 - Product Manager's Survival Guide – Chapter 11

Final Projects and Celebrating Your Achievements

- *Final Paper Showcase*: Present your Product Life Cycle Management Plan.
 - *Peer Reviews*: Provide constructive feedback on at least five peers' papers.
 - *Course Wrap-Up*: Reflect, celebrate accomplishments, and look ahead to your future success.
 - **Reading**: None assigned; focus on project work.
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Assignments and Grading

Assignment	Weight
Case Studies (4 group presentations)	10% each – total 40%
Business Case for Final Paper	10%
Online Quiz	10%
Participation via Online Forums	15%
Final Paper (PM Plan)	25%

The grading of each category is determined as follows. A more detailed rubric for each is posted in Moodle. Course and assignment grades, whether machine-graded or graded by the Instructor or Teaching Assistant, are final and not subject to negotiation. Students are advised **not to request additional points at the end of the term**, as this creates unfairness to other students. Grades are based on the university grading scale.

Participation (15%)

Participation is evaluated through the online forum and classroom engagement. At the end of the term, each student will submit a **participation report** summarizing their contributions, including statistics on post frequency and examples of meaningful participation. The evaluation considers both **quantity and quality**, as well as attendance and overall engagement.

Quiz (10%)

A single **online quiz** is scheduled early in the course to assess foundational knowledge of product management principles. This multiple-choice quiz, covering readings and course content, must be completed in a **single sitting**. Mastery of these principles is critical before the case study portion begins.

Case Studies (40%)

Students will work in teams to analyze **four case studies** on high-tech product management topics, with each case contributing **10%** toward the final grade. Each case requires an in-depth examination of a product in the context of key course concepts, culminating in a **5-slide PowerPoint pitch**. Teams will either present live during class (for campus sections) or submit a **5–10-minute recorded video** (for online sections). Follow the detailed instructions for each case study posted in Moodle.

Project (35%)

The course project is detailed in a separate document under **Course Documents** in Moodle. It consists of two key components:

- **Project Proposal and Business Case (10%)**: A detailed proposal outlining the product scope and justification.
 - **Final Product Management Plan (25%)**: A comprehensive report that covers all phases of the product life cycle, including development, supply chain, sales/marketing, and contingency planning.
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Additional Course Policies

Class Attendance

- **Campus Students**: Attendance is mandatory, with credit awarded for attending at least **12 class sessions**. Attendance will be recorded during each session.
- **Online Students**: Attendance is fulfilled by active participation in **case study forums** and completing required course activities.

For both sections, students must complete **all Moodle checkboxes** to confirm they have completed each required course component. Attendance is factored into the overall **participation grade**.

Academic Integrity

Students are expected to adhere to the highest standards of academic integrity. All work must be individual unless specified as a group assignment. Generative AI tools are permitted **only if their use is documented**. The University's full policy on academic integrity is detailed in the Code of Student Conduct (POL11.35.01).

Late Assignments

Assignments must be submitted on time via Moodle. Late submissions will incur a **10% penalty per day**, and no assignments will be accepted beyond **one week late**. Submissions by email are not permitted.