Life Cycle Product Management  
EGR 590-602 Special Topics in Engineering

Course Overview

This course covers the management of complex technical products during all phases of the product life cycle. 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 management of disruption. A particular emphasis is placed on the needs of complex high technology products and related engineering services. Business topics are covered as necessary to meet the needs of the engineering manager. Students are expected to learn good communication skills.

This course is complementary to the sister course “Managing new Hi-Tech Product Launches”. The courses may be taken in either order and both may be taken for credit. This course focuses on managing products throughout the product life cycle, and “Managing New Hi-Tech Product Launches” focuses on new product planning, design and initial market launch. Together, the two courses prepare a student for a career role in Product Management, a good transitory step between engineering and more senior management positions.

This course will be operated as an online asynchronous seminar course. Life Cycle Product Management principles and techniques covers a wide range of topics and here, they will be addressed through a series of case studies. The course consists of 14 weeks. Of these, there is a midterm week and a final project week. The remaining 12 weeks consist of case studies discussed in the context of product management principles that have been covered in the assigned readings. Each week, there will be 3 hours of video lecture, some asynchronous online discussion. The video should be watched by Wednesday so that you can engage in discussion and assignments. You may complete your readings, study and assignments at any time throughout the week. There will be reading every week. After the fourth week of the course, there will be ongoing project work. Once per month, you will be asked to submit a case report.

Prerequisite

Graduate standing with an undergraduate technical degree.
Course Topics Include:

- The Product Lifecycle Model
- Product Planning
- Understanding Customer Needs
- Product Teams
- Managing Product Design and Development
- System Integration
- Outsourcing and Managing Suppliers
- Supply Chain Analysis
- Product Field Testing
- Regulatory Environment
- Companion Services and Training
- Sales, Distribution and Presales Support
- Market Segmentation, Positioning and Pricing
- Sales, Distribution and pre-sales Support
- Providing Customer Service and CRM
- Product Safety, Recalls and Warranties
- Managing Product Upgrades
- Managing and Responding to Disruption
- Life Cycle Cost, P&L Management and ROI

Course Requirements

The course requires extensive reading and case studies. Students will be required to complete 3 case study reports (one page each taking a position on a case we have addressed). In addition, students will complete a product management plan as a course project. There will be an open book midterm to be taken online in a single sitting during the 10th week of the course containing multiple choice questions. The course grade will be determined from the following formula:

Case Reports  30%
Participation  20%
Midterm  20%
Project  30%

Exams are graded on percentage correct. Case Studies are graded 0-10, where 10 is outstanding, 9 is very good, 8 is good, 7 is marginally satisfactory. Participation is graded 50% on quantity (students are required to post substantively twice to each required discussion question), and 50% on quality. Participation grades will be recorded at the end of Week 7 and again at the end of the course. The final project grading policy is stated in the course project handout.
Textbooks

The following textbook is required reading in the course as assigned by the course syllabus. Each week, specific details about the relative importance of the various topics will be posted through course announcements.


In addition, two case studies have materials that need to be purchased. These are provided in the lecture charts, and they are summarized below:

GE Medical Systems, Case 9-512-039 at HBS: http://hbsp.harvard.edu/?topicSection=edu

Agile Electric: Quality Issues in a Global Supply Chain, Dhruv Dar, Sanjay Kumar, Vijay Aggarwal, Product number: W12056-PDF-ENG, also from Harvard

The total cost of all required materials for this course (three books and case materials) is approximately $120)

Instructor

Ed Addison
Adjunct Lecturer, Systems and Industrial Engineering eraddiso@ncsu.edu  (preferred method of communication)
Cell: 910-398-1200
Skype: edaddison214

Class Meeting Times

Class is to be offered online via Moodle with captured video lectures. Students will watch 24 lectures of 75 minutes each. Lectures will be scheduled for Mondays and Thursdays (you may watch as late as Wednesday or the weekend for the second lecture), except for school holidays. Assignments and grading will be synchronized to the scheduled dates, allowing for some slack in the event of business travel. Asynchronous discussions will be active Wednesday through Friday each week, but you may post as late as Sunday. However, you must make an initial post by Wednesday of each week. You are expected to spend at least two hours reading and posting to these discussions.
Course Project

Each student will complete a course project. The course project is a detailed Product Management Plan for a product selected by the student and related to the student’s job or graduate program. The Product Management Plan must address all aspects of the product life cycle including development, supply chain management, sales and marketing, customer service, product upgrades, contingency planning, and product replacement. A detailed handout on the course project will be provided by the second week of the course.

Student Learning Outcomes

Upon completion of this course, students will:

- Understand the principal issues involved in technical product management throughout all phases of the product life cycle.

- Be able to develop, plan and manage with a product management plan that covers design, development, test, marketing and sales, and customer support.

- Be skilled at participating in the development of a strategic plan that relates to organizational objectives for a product or product area including its phase out and replacement at the end of the product life cycle.

- Understand the relationship of supply chain issues and performance as it relates to the product manager’s job.

- Be aware of product liability issues, product warranties and their management and product recalls and their impact and management.

- Acquire basic financial management tools needed by product managers.

- Learn about the role of regulatory agencies and administrative law as it affects the provision of products to the marketplace.

- Become exposed to several markets through case studies including pharmaceutical, medical device, software, alternative energy products, electronics, telecommunications and entertainment products. Case studies will be sued so that students can learn the similarities and differences impacting product management in different markets.
## Course Schedule and Assignments

A detailed course calendar with specific due dates will be published each term this course is offered. The following outlines the course content and assignments by week. A separate document shows the case studies for each week for this term.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Assignments</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Product Management. Haines Ch. 1</td>
<td>Post your bio!</td>
</tr>
<tr>
<td>2</td>
<td>Product master planning. Product lifecycle management systems. Haines 2.</td>
<td>Familiarize with Moodle</td>
</tr>
<tr>
<td>3</td>
<td>Industry and Competition. Customer Needs. Haines Chs. 7-8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Product Structures, Product Teams. Management of Development. Haines Chs. 3-4.</td>
<td>Case 1 Due</td>
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<tr>
<td>5</td>
<td>Supply Chain Management for Products. Based on PPT and Handout Readings.</td>
<td>Project Proposal Due</td>
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<tr>
<td>6</td>
<td>Supply Chain Management for Products, cont.</td>
<td>Start project work</td>
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<tr>
<td>7</td>
<td>Strategic Planning, Decision Making,. Sales Forecasting. Haines Ch. 10</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Product Lifecycle Management. Haines Ch. 21</td>
<td>Case 2 Due</td>
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<tr>
<td>9</td>
<td>Financial Management for Product Managers. Haines CH 6</td>
<td>Prepare for Midterm</td>
</tr>
<tr>
<td>10</td>
<td>Review and Midterm.</td>
<td>Midterm</td>
</tr>
<tr>
<td>11</td>
<td>Product Management in Manufacturing and Services</td>
<td>Continue project work</td>
</tr>
<tr>
<td>12</td>
<td>Customer Service. Planning Product Replacements. Haines Ch. 21. Outside readings</td>
<td>Case 3 Due</td>
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<tr>
<td>14</td>
<td>Review and Project Completion</td>
<td>Final Project</td>
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Policies

**Academic Integrity** – Students must do their own work except where assignments are stated as group assignments. The University policy on academic integrity can be found in the [Code of Student Conduct](#). The Honor Pledge will be used upon submission of each assignment. It is expected that students will tests and assignments with honesty.

**Late Assignments** – Assignments must be submitted by the due date. Late assignments are reduced 5% per day for up to 5 days. After 5 days, assignments are not accepted.

**Exams** – The midterm exam in this course are open book and notes. Neither the Internet (i.e. Google, nor other people, may be consulted during an exam. Exams must be completed during the specific time period in one single sitting subject to a time limit. The midterm exam is comprehensive, covering primarily the lectures and readings, but topics discussed in the forums are fair game.

**Posting to Discussion Forums** – Discussion forums are an important part of this course. The initial questions will be posted at the beginning of the week, but additional questions may be added at any time. These are intended to be conversations, not solo essays. You are not graded as if it was a homework assignment, but rather you are graded for your active contribution to an intelligent conversation. You need not be comprehensive in your posts. Instead, just keep the conversation flowing and post only one idea at a time. You cannot be engaged in a conversation by waiting until Sunday night and then doing all your posts at once. You should log in periodically between Wednesday and the end of the week. You are required to read everything that any student posts. It is expected that you spend two hours per week researching, reading and posting to the forum. You should post two times per week and you must make an initial post by Thursday.