



# **Course Syllabus**

# **Product Design and**

# **Development**

**(Diseño y Desarrollo de Producto)**

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**August - December 2015**

**VIII Level**

**Professor**

**Estuardo Lu Chang-Say**

## **I. General Course information**

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Course: **PRODUCT DESIGN AND DEVELOPMENT**

Semester : 2015-II

Prerequisite: Gestión Comercial y de Marketing

Level: VIII

Career: Industrial and Commercial Engineering

Credits: 4

Course type: Mandatory

Teaching Hours: Total 5 hours per week (3 hours of theory and 2 hours of practice)

## **II. Summary**

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This is a theoretical-practical course that will provide to the students the skills needed to implement and monitor product launch projects, aligning the development and design of new product concepts to the market and consumer needs.

It examines the elements of the introduction of new products and product portfolio management, creation of customer value through innovations, product development process, concept & product testing, planning and monitoring of new products launching to the market.

## **III. Course Objective**

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The aim of the course is to facilitate that student develops a key competition in the search or creation of the value of a business, which consists in the developing of his capacity to generate, integrate and combine ideas to launch in a successful way new products to a market (including the design of a prototype of its package) as well as to develop and plan each of the stages of the process that must follow. The course seeks to develop also the skills of evaluation of the attractiveness of a category market of a new product, the effective presentation of his offers, as well as the leadership and the teamwork involve in the management of a launching project.

## **IV. Learning Results**

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As the outcome of completing this course, the student should be able to:

- Analyzes, evaluates and recommends the opportunities of market that could be turn into potential ideas for successful products launching that allow companies to lever up their growth strategies.
- Designs and develop in detail a plan and the process that an idea for a product have to follow to turn it into a winning concept, analyzing carefully each of its stages.
- Formulates and presents clearly how to develop a differential concept from a product idea and a better comprehension of the needs of the target audience.
- Evaluates the attractiveness of the market for a new product, applying methods of forecasting or estimating potential market demand.
- Designs, analyzes and interprets research and products or concepts tests.

- Designs and establishes the plans for launching and methods of introduction of new products to the market aligned with the rest of the marketing mix variables.
- Develops the skills of speaking and writing, as well as the argumentation and the effective presentation of proposals, research plans and launching plans.

The following measure scale is used to evaluate the relations between the course's objectives and the competences of the programs. (5 = Very High, 4 = High, 3 = Medium, 2 = Low, 1 = Very Low)

a. Ability to apply the knowledge of mathematics, science and engineering.	2
b. Ability to design and realize experiments, as well as analyze and interpret data.	3
c. Ability to design a system, component or process to satisfy desired needs within realistic constraints such as economic, environmental, social, political, ethical, health, security, manufacturing, and sustainability.	4
d. Ability to interact effectively in multidisciplinary teams.	3
e. Ability to identify, formulate and solve engineering problems.	4
f. Understand and respect the professional and ethical responsibilities.	2
g. Possess the ability to communicate effectively both orally and in writing.	3
h. Ability to understand the impact of engineering solutions in global, economic, environmental and social contexts.	3
i. Recognizes the need for continuous learning and willingness to be trained throughout their lives.	4
a. Ability to use techniques, skills and modern tools necessary for the practice of Industrial and Commercial Engineering.	4

## V. Methodology

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The methodology of the course encourages student active participation and use of diverse methods and techniques. The professor acts as learning facilitator, combining class expositions, lecture analysis and discussions, case studies and discussions, discussion of journals articles and teamwork.

The method of teaching reinforces the participant learning and develops the skills needed to performance successfully in the business world such as analytical skills, critical synthesis, solving problems and decision making.

A mandatory textbook is used, and it will be combined with complementary lectures. Besides, the course encourages students to work each topic using the case method.

The course contemplates the accomplishment and sustentation of a final proposed plan to develop the launching or relaunching of a product of the choice of the students. The final project is developed in teams.

## VI. Evaluation

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The evaluation system is permanent and comprehensive, and is intended to promote student learning. The course grade is obtained by averaging the permanent evaluation (55%), the midterm exam (20%) and the final exam (25%).

The permanent evaluation is the weighted average of the corresponding assessments: Reading Control Quizzes / Graded Assessments / Case Studies Presentations / Final Work – Product Launching Plan y Package Prototype / X Culture Project Participation. The average of these scores gives the corresponding note.

The weights of the permanent evaluation are described in the following table:

PERMANENT EVALUATION AVERAGE (PEA) 60%				
Evaluation Type	Description	%		
Reading Control	2 quizzes	10		
Graded Assessments	3 Tests of application	12	12	12
Case Study	3 Case studies and other tasks	12		
Final Assignment Teamwork	A New Product Launching Plan Including the Package prototype	22		
X Culture Project Participation	International Marketing Plan (see exhibit)	20		

The final average (FA) is obtained as follows:

$$FA = (0,20 \times ME) + (0,60 \times PEA) + (0,20 \times FE)$$

**FA:** Final Average

**PEA:** Permanent Evaluation Average

**ME:** Mid-term Exam

**FE:** Final Exam

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## VIII. Program Content

WEEK	CONTENTS	ACTIVITIES / EVALUATION
<b>LEARNING UNIT 1: PRODUCT DEVELOPMENT FUNDAMENTALS AND PROCESS</b>		
Learning Goal: Recognizes the need for continuous learning and willingness to be trained throughout their lives.		
<p>1st August 24 - 29</p>	<p><b>PRODUCT MARKETING IMPORTANCE</b></p> <ol style="list-style-type: none"> <li>1. Relevance of client centric businesses</li> <li>2. Value generation</li> <li>2. Product Idea and Product Concept</li> <li>3. Strategic and Tactical Planning in Marketing</li> </ol> <p><b>NEW PRODUCTS AND INNOVATIONS</b></p> <ol style="list-style-type: none"> <li>1. What is a New Product?</li> <li>2. Technological Innovation and entrepreneurship</li> <li>3. The S Curve with new products</li> <li>4. Types of new products</li> </ol> <p>The Process of Innovation BAKER M. &amp; HART S. (2007). Chaps. 1. <i>Competition and product strategy</i>, pp. 33-39.</p> <p>BAKER M. &amp; HART S. (2007). Chaps. 2. <i>The product in theory and practice</i>, pp. 40-71.</p>	<p>Presentation of the Course Methodology</p> <p>Guidelines for the Final Investigation Work</p>
<p>2nd August 31 to September 05</p>	<p><b>WHY DEVELOPING NEW PRODUCTS?</b></p> <ol style="list-style-type: none"> <li>1. Importance of New Products</li> <li>2. Main Reasons of the Failure of New Products</li> <li>3. Key Success Factors of New Products</li> </ol> <p><b>NEW PRODUCT PROCESS OF DEVELOPMENT</b></p> <ol style="list-style-type: none"> <li>1. Reduction of Products Lifecycles</li> <li>2. Time to Market</li> <li>3. Product development process</li> <li>4. Stage-Gate process</li> <li>5. Product Lifecycle Management - PLM</li> </ol> <p>ULRICH K. &amp; EPPINGER, S. (2012). Chaps. 1, Introduction, pp.1-10.</p> <p>BAKER M. &amp; HART S. (2007). Chaps. 4 &amp; 6. <i>The product lifecycle in theory and practice &amp; The importance, nature and management of new product development process</i>. pp. 103-135 pp. 157-196.</p>	<p>Assignment 1</p>
<p>3rd September 07 - 12</p>	<p><b>NEW PRODUCTS MANAGEMENT</b></p> <ol style="list-style-type: none"> <li>1. Organization and Structure</li> <li>2. Global Vision of the Development Process</li> <li>3. Product policy and guidelines: Mission</li> <li>4. Product portfolio analysis</li> <li>5. Generic Company Strategies</li> </ol>	<p>Reading Quiz 1 (Weeks 1 &amp; 2)</p>

	6. Growing Strategies: New Product & New Market	
	<p>ULRICH K. &amp; EPPINGER, S. (2012). Chaps. 2, Development processes and organizations, pp.11-36.</p> <p>Managing Competition: The Product Strategy is Central BAKER M. &amp; HART S. (2007). Chaps. 1. <i>Competition and product strategy</i>, pp. 19-33.</p> <p>BAKER M. &amp; HART S. (2007). Chaps. 5. <i>Product portfolios</i>, pp. 136-153</p>	
<p><b>LEARNING UNIT 2: PRODUCT IDEATION, OPPORTUNITY SEEKING AND ATTRACTIVENESS VALIDATION</b></p> <p>Learning Goal: Ability to identify, formulate and solve engineering problems.</p>		
<p>4<sup>th</sup> September 14 - 19</p>	<p><b>BLUE OCEAN STRATEGY</b></p> <ol style="list-style-type: none"> <li>1. The pursuit of more attractive markets</li> <li>2. How to create a new value proposition</li> <li>3. How to create new valuable markets</li> </ol> <p><b>CREATIVITY AND INNOVATION</b></p> <ol style="list-style-type: none"> <li>1. The Creative Process</li> <li>2. Problem Solving</li> <li>3. Brakes and Blocks to Creativity</li> </ol> <p><b>HOW TO SEARCH AND FIND IDEAS FOR NEW PRODUCTS?</b></p> <ol style="list-style-type: none"> <li>1. Origin of Ideas, sources of opportunities</li> <li>2. Creatives techniques</li> <li>3. Rational and intuitives techniques</li> </ol>	<p>Reading Quiz 2 (Weeks 3 &amp; 4)</p>
	<p>CHAN, K. &amp; MAUBORGNE, R. Chaps. 1, 2 &amp; 3, Creating blue oceans, Analytical tools and Frameworks &amp; Reconstruction of the market boundaries. pp. 1-80.</p> <p>ULRICH K. &amp; EPPINGER, S. (2012). Chaps. 3, <i>Opportunity Identification</i> pp. 35-51.</p>	
<p>5<sup>th</sup> September 21 - 26</p>	<p><b>IDENTIFICATION OF NEEDS</b></p> <ol style="list-style-type: none"> <li>1. Needs Analysis Process</li> <li>2. Attitude and Product Usage Studies</li> <li>3. Matrix of attributes importance versus customers evaluations</li> <li>4. Creating Customers Value Proposition</li> </ol> <p><b>SELECTION OF IDEAS</b></p> <ol style="list-style-type: none"> <li>1. Screening of Ideas</li> <li>2. Methods to Select the best ideas.</li> </ol>	<p>Case Study 1</p> <p>Pass Readiness Test for X Culture Project Participation</p>
	<p>ULRICH K. &amp; EPPINGER, S. (2012). Chap. 5, <i>Identifying</i></p>	

	customer needs pp. 73-90. BAKER M. & HART S. (2007). Chaps. 8. & 9, <i>Idea management for new product development &amp; Screening new products</i> , pp. 215-254, 256-273.	
6 <sup>th</sup> September 28 to October 03	<b>MARKET ATTRACTIVENESS ANALYSIS</b> 1. Strategic Validation of the Opportunity and Attractiveness of the Market 2. Market Attractiveness Matrix versus Competitive Position or IE Matrix. Applications to a portfolio of projects.	Test 1 (Weeks 1 to 5)
	BAKER M. & HART S. (2007). Chaps. 11, <i>Business Analysis</i> . pp.308-328.	
7 <sup>th</sup> October 05 - 10	<b>VALIDATION OF MARKET ATTRACTIVENESS</b> 1. Market Size Studies 2. Methods for New Products Demand Forecasting	First Delivery of Final Assignment
	KAHN, K. (2006) <i>New Product Forecasting: An Applied Perspective</i> . Sharpe Inc. Chap. 1 pp. 10-18.	
8 <sup>th</sup> October 12 - 17	<b>MID-TERM EXAM</b>	Until week 7

<b>LEARNING UNIT 3: CONCEPT CREATION AND COSTUMER VALIDATIONS</b>		
Learning Goal: Ability to use techniques, skills and modern tools necessary for the practice of Industrial and Commercial Engineering.		
9 <sup>th</sup> October 19 - 24	<b>WINNING CONCEPTS CREATIONS</b> 1. Development of a Concept: the process of pursuit value 2. Importance of discovering Insights. 3. Empathy map 4. Development of Positioning Concepts 5. Key Benefits types for Concept creation	
	ULRICH K. & EPPINGER, S. (2007) cap. 7, <i>Concept Generation</i> , pp. 119-141. BAKER M. & HART S. (2007). Chaps. 10, <i>Concept Development and Testing</i> . pp. 274-307.	
10 <sup>th</sup> October 26 - 31	<b>CONCEPT AND PRODUCT TESTING</b> 1. How to prepare a market research brief 2. Concept Test 3. Product Test 4. Proof of Concept and Use	Assignment 3
	ULRICH K. & EPPINGER, S. (2013) Chap. 9, <i>Concept Test</i> , pp. 165-180.	

	<p>BAKER M. &amp; HART S. (2007). Chaps. 12, <i>Product Testing</i>. pp. 327-354.</p> <p>POPE, Jeffrey (1993). Part IV: Solving specific marketing problems. pp. 130 – 197, 210-216.</p>	
<p>11th November 02 - 07</p>	<p><b>TECHNICAL STANDARDS AND PRODUCT SPECIFICATIONS</b></p> <ol style="list-style-type: none"> <li>1. When to establish specifications?</li> <li>2. Establishment of target specifications</li> <li>3. Matrix of the Houses of Quality: Integrating customer requirements in the design</li> </ol>	Class in laboratory
	<p>ULRICH K. &amp; EPPINGER, S. Chap. 6, pp. 91-116, <i>Product specifications</i>.</p> <p>COHEN, L. (1995). <i>Quality Function Deployment. How to make QFD work for you</i>. Chaps. 4, 5 &amp; 6 pp. 68-122, Chaps. 17. pp. 296-306.</p>	
<p><b>LEARNING UNIT 4: BRANDING, PACKAGING AND LAUNCHING STRATEGIES</b></p> <p>Learning Goal: Ability to design a system, component or process to satisfy desired needs within realistic constraints such as economic, environmental, social, political, ethical, health, security, manufacturing, and sustainability.</p>		
<p>12th November 09 - 14</p>	<p><b>BRAND INDENTITY AND INTELLECTUAL PROPERTY</b></p> <ol style="list-style-type: none"> <li>1. Intellectual Property Right and Branding</li> <li>2. Brand Management and Brand Identity.</li> <li>3. Brand Strategies for a portfolio of products and line extensions.</li> </ol>	<p>Test 2 In laboratory (weeks 7 to 10)</p>
	<p>AAKER, D. &amp; JOACHIMSTHALER, E. <i>Chap. 2, Band identity – the cornerstone of the brand strategy</i>, pp. 31-64</p>	
<p>13th November 16 - 21</p>	<p><b>PACKAGING</b></p> <ol style="list-style-type: none"> <li>1. Components and functionalities of a Package</li> <li>2. Types of Packages.</li> <li>3. Package impact in the ecology</li> <li>4. Packaging Technologies and Trends.</li> <li>5. Development of a package prototype</li> </ol>	<p>Assignment 4 Development of the secondary package for the product of the final assignment. (Use of Fab Lab)</p>
	<p>CHUNAWALLA, S.A. (2009). Chap. 21. <i>Packaging</i>.</p>	
<p>14th November 23 – 28</p>	<p><b>INTRODUCTION AND LAUNCHING</b></p> <ol style="list-style-type: none"> <li>1. Consumer Buying Behavior and Innovations: Diffusion and Adoption</li> <li>2. Blocks and risks to new product adoption</li> <li>3. Launching Methods and Strategies for a New Product Introduction</li> <li>4. Sales Promotions to accelerate introduction</li> </ol>	<p>Test 3 In laboratory (weeks 11 to 13)</p>
	<p>BAKER M. &amp; HART S. (2007). Chaps. 3 and 13, <i>Buyer behavior &amp; Commercialization: test marketing and launching the new product</i>, pp. 72-102, 357-396.</p>	



<p>15<sup>th</sup> November 30 to December 05</p>	<p><b>FINAL PRESENTATIONS OF TEAM ASSIGNMENTS and X CULTURE PROJECT PLANS</b></p>	<p>Delivery and Presentation of Final Assignment</p>
<p>16<sup>th</sup> December 07 - 12</p>	<p><b>FINAL EXAM</b></p>	

## IX. Bibliography

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### Textbook

1. ULRICH, K. & EPPINGER, S. (2012). *Product Design and Development*. (5th Ed.). Los Angeles: McGraw Hill Education.
2. BAKER M. & HART S. (2007). *Product Strategy and Management*. (2<sup>nd</sup> Ed.) Edinburgh, Pearson Education

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### Complementary texts

1. AAKER D. & JOACHIMSTHALER, E. (2000). *Brand Leadership*. NewYork, The Free Press.
2. CHAN KIM, W. & MAUBORGNE, R. (2005). *Blue Ocean Strategy*. Boston: Harvard Business School Press.
3. CHUNAWALLA, S.A (2009). *Product Management*. Mumbai, Himalaya Publication.  
<http://site.ebrary.com/lib/esan/docDetail.action?docID=10415149&p00=chunawalla>
4. COHEN, L. (1995). *Quality Function Deployment. How to make QFD work for you. Massachusetts*, Addison-Wesley Publishing Co.
5. FERNANDEZ DEL HOYO, A. (2009) *Innovación y gestión de nuevos productos: a visión estratégica y práctica*. Madrid: Pirámide
6. KAHN, Kenneth. (2006) *New Product Forecasting: An Applied Perspective*. Sharpe Inc.  
Download free version by chapters at:  
<http://site.ebrary.com/lib/esan/docDetail.action?docID=10178089&p00=kahn>
7. KAPFERER, J. (2007) *The New Strategic Brand Management*. (3<sup>rd</sup> Ed.) London and Philadelphia, Kogan Page.
8. LEHMANN, D. & WINER, R. (2002). *Product Management*. (3rdEd.). Boston: McGraw-Hill Education.

9. POPE, J. (2002). *Investigación de Mercados: Guía maestra para el profesional*. Bogotá: Norma.
10. SCHNARCH, A. (2009). *Desarrollo de Nuevos Productos y Empresas*. (5ta. ed.) Bogotá: McGraw Hill Interamericana.

## **IX. Requirement of laboratory**

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Computer lab will be used for practical classes.

## **X. Professor**

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**Estuardo Lu Chang-Say, Industrial Engineer – Ind. Eng. MBA**  
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## **X. Exhibits**

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### **X Culture Project - International Student Collaboration Project**

<http://x-culture.org/>

Students can develop their global collaboration skills, interacting with their multinational team of 6-7 members through eight weeks. (Collaboration tools: email, Skype, Google docs, Facebook groups, Dropbox, others.)

Each team have to develop a business proposal for an international company which consist in the idea of the product, the economic feasibility and the plan of launching it in a specific global market.

This semester ESAN's students are teaming with 3,000 students of 80 universities in 40 countries.

### **Final Team Assignment - Launching Plan for a new product**

Your group should perform **a strategic assessment, strategic formulation and launching strategy of a new product or the relaunching of an existing one in a determine category given by Professor in class.**

The work includes the analysis and diagnosis of the situation to determine the level of attractiveness and propose recommendations with objectives and strategies to improve the situation of the chosen brand. Specific instructions would be given for these.