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## SYLLABUS

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**Date/ Revision** : 15 July 2016  
**Faculty** : Business and Social Sciences  
**Approval** :Dr. Samuel Prasetya

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### SUBJECT : Innovation and Product Development

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#### 1. Identification of Subject:

Name of Subject : Innovation and Product Development  
Code of Subject : PROD-2100  
SKS / ECTS : 2/3  
Semester : 3  
Study Program :B-MGT/B-IBA/B-INR/B-HTM  
Lecturer : Norman Yachya , ST, MM, Timotius A. Rachmat, MM & Astrid Wiriadijaja, MSi

#### 2. Competency

Afterhavingthecourse, studentsareexpectedto:

- a) Identify and analyze the strategic elements of new product innovation, e.g., the process, different functions, and individual roles.
- b) Assess and evaluate advantages and disadvantages with an internal versus open innovation approach.
- c) Propose a framework suitable for the management of new product innovation processes.
- d) Describe the nature and techniques of innovation and new product development;
- e) Discuss the role marketing plays in the early stages of product innovation and how the pattern of consumption influences the likely success or failure of a new product;
- f) Evaluate the process of developing new products and many of the new product management issues faced by companies;
- g) Demonstrate the best level of practice in each problem situation within the context of innovation and new product development;
- h) After completing the course, students will be able to describe the core aspects of Innovation and product development.
- i) Through the successful participation in this course students are able to recognize how to implement innovation and create new product development.

#### 3. Description of Subject:

This course provides students with an in-depth understanding of innovation and new product development using a management framework. It focuses on how to create value and growth through innovation in new and existing markets. Students will explore the concepts, methods and tools on how to organize and manage innovation process with the objective to better control cost and risk, examine the process of developing new products and many of the new product management issues faced by companies. Plenty of case studies will be discussed to help students to better understand the successes and failures in innovation and new product development, ultimately, to improve the chance of success.

#### 4. Learning Approach

Approach : Classroom , One on one , group discussion and interactive activities.  
Method : A combination of lectures, case studies, videos, live projects and in-class discussions will be employed to familiarize students with the theories and key concepts of the course. Students are required to participate actively in class discussion.

Student Task : Group Assignment  
Media : LCD and Video

#### 5. Evaluation

a) Absencemaximum	: 25%
b) Participationindiscussion	: 10points
c) Group Assignment	: 20points
d) Project Presentation	: 15points
e) Daily Quiz	: 10points
f) Final Examination	: 45points
Total	: 100points



Week	Topics	Content	Remark
	Product Planning	<p>Thought Questions</p> <p><b>The Product Planning Process</b></p> <p><i>Four Types of Product Development Projects The Process</i></p> <p>Step 1: Identify Opportunities</p> <p>Step 2: Evaluate and Prioritize Projects</p> <p><i>Competitive Strategy</i></p> <p><i>Market Segmentation</i></p> <p><i>Technological Trajectories</i></p> <p><i>Product Platform Planning</i></p> <p><i>Evaluating Fundamentally New Product Opportunities</i></p> <p><i>Balancing the Portfolio</i></p> <p>Step 3: Allocate Resources and Plan Timing</p> <p><i>Resource Allocation</i></p> <p><i>Project Timing</i></p> <p><i>The Product Plan</i></p> <p>Step 4: Complete Pre-Project Planning</p> <p><i>Mission Statements</i></p> <p><i>Assumptions and Constraints</i></p> <p><i>Staffing and Other Pre-Project Planning Activities</i></p> <p>Step 5: Reflect on the Results and the Process</p> <p>Exercises</p> <p>Thought Questions</p>	Chapter 4
3	Identifying Customer Needs	<p>Step 1: Gather Raw Data from Customers</p> <p><i>Choosing Customers</i></p> <p><i>The Art of Eliciting Customer Needs Data</i></p> <p><i>Documenting Interactions with Customers</i></p> <p>Step 2: Interpret Raw Data in Terms of Customer Needs</p> <p>Step 3: Organize the Needs into a Hierarchy</p> <p>Step 4: Establish the Relative Importance of the Needs</p> <p>Step 5: Reflect on the Results and the Process</p> <p>Exercises</p> <p>Thought Questions</p>	Chapter 5
	Product Specifications	<p>What Are Specifications?</p> <p>When Are Specifications Established?</p> <p>Establishing Target Specifications</p> <p><i>Step 1: Prepare the List of Metrics</i></p> <p><i>Step 2: Collect Competitive Benchmarking Information</i></p> <p><i>Step 3: Set Ideal and Marginally Acceptable Target Values</i></p> <p><i>Step 4: Reflect on the Results and the Process</i></p> <p>Setting the Final Specifications</p> <p><i>Step 1: Develop Technical Models of the Product</i></p> <p><i>Step 2: Develop a Cost Model of the Product</i></p> <p><i>Step 3: Refine the Specifications, Making Trade-Offs Where Necessary</i></p> <p><i>Step 4: Flow Down the Specifications as Appropriate</i></p> <p><i>Step 5: Reflect on the Results and the Process</i></p> <p>Exercises</p> <p>Thought Questions</p>	Chapter 6
4	Concept Generation	The Activity of Concept Generation	Chapter 7

Week	Topics	Content	Remark
		<p><i>Structured Approaches Reduce the Likelihood of Costly Problems</i></p> <p><i>A Five-Step Method</i></p> <p>Step 1: Clarify the Problem</p> <p><i>Decompose a Complex Problem into Simpler Subproblems</i></p> <p><i>Focus Initial Efforts on the Critical Subproblems</i></p> <p>Step 2: Search Externally</p> <p><i>Interview Lead Users</i></p> <p><i>Consult Experts</i></p> <p><i>Search Patents</i></p> <p><i>Search Published Literature</i></p> <p><i>Benchmark Related Products</i></p> <p>Step 3: Search Internally</p> <p><i>Both Individual and Group Sessions Can Be Useful Hints for Generating Solution Concepts</i></p> <p>Step 4: Explore Systematically</p> <p><i>Concept Classification Tree</i></p> <p><i>Concept Combination Table</i></p> <p><i>Managing the Exploration Process</i></p> <p>Step 5: Reflect on the Solutions and the Process</p> <p>Exercises</p> <p>Thought Questions</p>	
5	Concept Selection	<p>Concept Selection Is an Integral Part of the Product Development Process</p> <p>All Teams Use Some Method for Choosing a Concept</p> <p>A Structured Method Offers Several Benefits</p> <p>Overview of Methodology</p> <p>Concept Screening</p> <p><i>Step 1: Prepare the Selection Matrix</i></p> <p><i>Step 2: Rate the Concepts</i></p> <p><i>Step 3: Rank the Concepts</i></p> <p><i>Step 4: Combine and Improve the Concepts</i></p> <p><i>Step 5: Select One or More Concepts</i></p> <p><i>Step 6: Reflect on the Results and the Process</i></p> <p>Concept Scoring</p> <p><i>Step 1: Prepare the Selection Matrix</i></p> <p><i>Step 2: Rate the Concepts</i></p> <p><i>Step 3: Rank the Concepts</i></p> <p><i>Step 4: Combine and Improve the Concepts</i></p> <p><i>Step 5: Select One or More Concepts</i></p> <p><i>Step 6: Reflect on the Results and the Process</i></p> <p>Caveats</p> <p>Exercises</p> <p>Thought Questions</p>	Chapter 8
6	Concept Testing	<p>Step 1: Define the Purpose of the Concept Test</p> <p>Step 2: Choose a Survey Population</p> <p>Step 3: Choose a Survey Format</p> <p>Step 4: Communicate the Concept</p> <p><i>Matching the Survey Format with the Means of Communicating the Concept</i></p> <p><i>Issues in Communicating the Concept</i></p>	Chapter 9



Week	Topics	Content	Remark
		<p>6. Coordination with Engineering, Manufacturing, and External Vendors</p> <p>The Impact of Computer-Based Tools on the ID Process</p> <p>Management of the Industrial Design Process</p> <p>Timing of Industrial Design Involvement</p> <p>Assessing the Quality of Industrial Design</p> <ol style="list-style-type: none"> <li>1. Quality of the User Interface</li> <li>2. Emotional Appeal</li> <li>3. Ability to Maintain and Repair the Product</li> <li>4. Appropriate Use of Resources</li> <li>5. Product Differentiation</li> </ol> <p>Exercises</p> <p>Thought Questions</p>	
10	Design for Environment	<p>What Is Design for Environment?</p> <p>Two Life Cycles</p> <p>Environmental Impacts</p> <p>History of Design for Environment</p> <p>Herman Miller's Journey toward Design for Environment</p> <p>The Design for Environment Process</p> <p>Step 1: Set the DFE Agenda: Drivers, Goals, and Team</p> <p>Identify the Internal and External Drivers of DFE</p> <p>Set the DFE Goals</p> <p>Set Up the DFE Team</p> <p>Step 2: Identify Potential Environmental Impacts</p> <p>Step 3: Select DFE Guidelines</p> <p>Step 4: Apply the DFE Guidelines to the Initial Product Design</p> <p>Step 5: Assess the Environmental Impacts</p> <p>Compare the Environmental Impacts to DFE Goals</p> <p>Step 6: Refine the Product Design to Reduce or Eliminate the Environmental Impacts</p> <p>Step 7: Reflect on the DFE Process and Results</p> <p>Exercises</p> <p>Thought Questions</p> <p><b>Design for Environment Guidelines</b></p>	Chapter 12
11	Design for manufacturing	<p>Design for Manufacturing Defined</p> <p>DFM Requires a Cross-Functional Team</p> <p>DFMIs Performed throughout the Development Process</p> <p>Overview of the DFM Process</p> <p>Step 1: Estimate the Manufacturing Costs</p> <p>Transportation Costs</p> <p>Fixed Costs versus Variable Costs</p> <p>The Bill of Materials</p> <p>Estimating the Costs of Standard Components</p> <p>Estimating the Costs of Custom Components</p> <p>Estimating the Cost of Assembly</p> <p>Estimating the Overhead Costs</p> <p>Step 2: Reduce the Costs of Components</p> <p>Understand the Process Constraints and Cost Drivers</p>	Chapter 13





Week	Topics	Content	Remark
		<p>Step 3: Develop the Experimental Plan <i>Experimental Designs</i> <i>Testing Noise Factors</i></p> <p>Step 4: Run the Experiment</p> <p>Step 5: Conduct the Analysis <i>Computing the Objective Function</i> <i>Computing Factor Effects by Analysis of Means</i></p> <p>Step 6: Select and Confirm Factor</p> <p>Setpoints</p> <p>Step 7: Reflect and Repeat</p> <p>Exercises Thought Questions</p>	
13	Patents and intellectual property	<p>What Is Intellectual Property? <i>Overview of Patents</i> <i>Utility Patents</i> <i>Preparing a Disclosure</i></p> <p>Step 1: Formulate a Strategy and Plan <i>Timing of Patent Applications</i> <i>Type of Application</i> <i>Scope of Application</i></p> <p>Step 2: Study Prior Inventions</p> <p>Step 3: Outline Claims</p> <p>Step 4: Write the Description of the Invention <i>Figures</i> <i>Writing the Detailed Description</i> <i>Defensive Disclosure</i></p> <p>Step 5: Refine Claims <i>Writing the Claims</i> <i>Guidelines for Crafting Claims</i></p> <p>Step 6: Pursue Application</p> <p>Step 7: Reflect on the Results and the Process</p> <p>Exercises Thought Questions</p>	Chapter 16
14	Product development Economics, Managing Project	<p>Elements of Economic Analysis <i>Quantitative Analysis</i> <i>Qualitative Analysis</i> <i>When Should Economic Analysis Be Performed?</i> <i>Economic Analysis Process</i></p> <p>Step 1: Build a Base-Case Financial Model <i>Estimate the Timing and Magnitude of Future Cash Inflows and Outflows</i> <i>Compute the Net Present Value of the Cash Flows</i> <i>The Base-Case Financial Model Can Support Go/No-Go Decisions and Major Investment Decisions</i></p> <p>Step 2: Perform Sensitivity Analysis <i>Development Cost Example</i> <i>Development Time Example</i></p> <p>Step 3: Use Sensitivity Analysis to Understand Project Trade-</p>	Chapter 17

Week	Topics	Content	Remark
	Managing Projects	<p>Offs  <i>Six Potential Interactions</i>  <i>Trade-Off Rules</i>  <i>Limitations of Quantitative Analysis 366</i>                      Step 4: Consider the Influence of the Qualitative Factors on Project Success  <i>Projects Interact with the Firm, the Market, and the Macro Environment</i>  <i>Carrying Out Qualitative Analysis</i></p> <p>Exercises                      Thought Questions</p> <p>Understanding and Representing Tasks  <i>Sequential, Parallel, and Coupled Tasks</i>  <i>The Design Structure Matrix</i>  <i>Gantt Charts</i>  <i>PERT Charts</i>  <i>The Critical Path</i>                      Baseline Project Planning  <i>The Contract Book</i>  <i>Project Task List</i>  <i>Team Staffing and Organization</i>  <i>Project Schedule</i>  <i>Project Budget</i>  <i>Project Risk Plan</i>  <i>Modifying the Baseline Plan</i>                      Accelerating Projects                      Project Execution  <i>Coordination Mechanisms</i>  <i>Assessing Project Status</i>  <i>Corrective Actions</i>                      Postmortem Project Evaluation</p> <p>Exercises                      Thought Questions</p>	Chapter 18
15	Final Examination		
16	Break		

## 7. BookReference:

- a) TextBook: Product Design and Development , Karl Ulrich and Steven D Eppinger

