

**THE SMEAL COLLEGE OF BUSINESS
PENNSYLVANIA STATE UNIVERSITY**

**MKTG 542. NEW PRODUCT DEVELOPMENT (NPD)
Fall, 2010 (1:15-3:15 pm, T&R, 125 Business Building)**

Instructor:	Professor Min Ding	Email:	minding@psu.edu
Office:	408 Business Building	Office hours:	Friday 2:00—5:00 pm or by appointments
Telephone:	(814) 865-0622		
URL:	http://www.planetding.org		

OBJECTIVES

Understand the process and major challenges in NPD.

This course introduces you to critical steps and tools in NPD, key NPD challenges, and a few relatively new topics related to NPD.

Develop and Sell a New Product

This course also provides you with an opportunity to try out the NPD process, and develop your own new product.

Evaluate a New Product Opportunity/Case

In addition, you will have a chance to showcase your ability to (1) identify a winner (NP), or (2) identify a loser (NP), or (3) identify a high reward NP opportunity.

COURSE MATERIAL

A Good Reference Book

- Design and Marketing of New Products, G. Urban and J. Hauser, 1993, Prentice-Hall, Inc. **(U&H)**

Other Helpful Sources

- Product Design and Development, K. Ulrich and S. Eppinger, 4th ed. 2007, McGraw-Hill Companies – a very accessible textbook.
- Patent It Yourself, D. Pressman, 14th ed. 2009, Nolo, Berkeley, CA 94710.

Lecture Notes and (optional) Readings

- Hardcopy lecture slides will be made available to you before each class.
- Readings can be downloaded from course website (<http://teaching.planetding.org>).

SUPPORT

The best time to chat is during my office hours, before and after each class, and if needed, by appointment. In general, email is the best way to get hold of me, voicemail is the worst.

If you need help on patent search, please contact Kevin R. Harwell, Business Librarian. Alternatively, you can search the USPTO database on its website, and Google Patent search.

For filing patent on the USPTO website, full technical support is available through the Patent Electronic Business Center (EBC) at 866-217-9197 from 6 a.m. to 12 Midnight Eastern Time, Monday – Friday. Limited assistance is available at all other times through Electronic Business Support (EBS) at 1 800 786-9199 or 571-272-1000. They are generally very helpful.

COURSE STRUCTURE

We have four types of classes: (1) Lectures, (2) Team Presentation (uCase and Project), (3) Team consultation, and (4) Marketing/Selling.

Reading material (listed in this syllabus) and material in U&H are background readings intended to support the classroom learning, they provide more in-depth exposition of the relevant topics.

TEAMS

The class will be divided into teams. As a team, you will complete all tasks related to the project and uCase. Each team should have **three individuals (four is acceptable but not encouraged)**.

You can form your own team before the end of 10/21/10 (please email me the team members as soon as you do). I will randomly assign remaining students into teams on 10/22/10 (after the add/drop period ends). I have several suggestions, but it's up to you to decide who you want to work with:

- You probably want to work with people you are comfortable with (among other reasons, you will generate and own something valuable together).
- You may want to organize a team with balanced expertise (e.g., business versus technical).
- I encourage you to form multinational teams. This is both beneficial to your learning experience and helpful to the new product you will develop.

As a courtesy to your colleagues, do NOT join a team if you might drop the course.

PROJECT

Some thoughts on What New Products to Develop

- Must have substantial innovation, ideally patentable
- Can't reinvent the wheel – it cannot be in patent database or public domain
- Arbitrage is encouraged (borrow from one category, modify, then use it for another purpose)
- You can actually make it (outsource is fine) within a few weeks, thus capability and finance (you are, of course, free to get investors to support your project) will dictate which categories you want to invent
- Snuggie (blanket with sleeves) type of new products are acceptable
- You may buy an existing product, make modification to it to satisfy the needs you identified, and sell the modified version (the modification, of course, must be nontrivial. Your profit (value) should not come from labor).
- Pure arts and crafts are out; unless they serve a nontrivial need you identified.
- Get inspiration from young moms – Reading List, R8 (course website).

What you can and cannot outsource:

- You can outsource the “making” component of the project to outsiders (friends, family, or any third party...)
- All other components (e.g, identify needs, create the new product concept, design, selling...) must be done by your team

Financials:

- Cost (we will only count the variable cost for the purpose of this course):
 - All material used to produce the products
 - Labor expense associated with making the products. We will assume it is \$10 per hour, regardless whether you made the products yourself or third party made it.
 - We will ignore the cost in all steps prior to making the products as well as the selling/promotion expenses.
- Price
 - You determine price
 - Think value pricing
- Units
 - I expect you to make and sell 10 units of your products, but you can of course make and sell as many as you want. A larger number (and thus the profit) will positively affect your grade.
 - We will have a class selling/marketing session (on 12/2), to be hosted in Atrium. You need to bring a minimum of 2 units to the session (to be finalized later). You should sell as many as you can prior to that session using whatever channels that are appropriate.
- Profit
 - You should plan your return rate at 100% or higher. In other words, your product should be such that you are confident you can charge twice as much as the variable cost. This means your innovation must create a lot of value, the value should not come from the labor.

We will judge the overall quality of your new product based on outcomes (deliverables count for a separate component of your grade):

- The rate of return

- The number of units you sold
- The total profit you made
- Your projected return (\$) if you scale it up and sell it to your target segments

Deliverables:

- The detailed roadmap and deliverables are in Appendix 2.
- You will also give a presentation during the last class

uCase

The project has put a lot of constraints on your imagination, and this uCase analysis gives you complete freedom.

I want to encourage non conventional thinking, so as a team, you need to identify a case, analyze it, and present it to the class. You can pick your uCase from one of the three types described below:

- A product/service soon to be launched or recently launched. The received wisdom (media, external reviews, senior managers, R&D people, etc) believes it will be a success, or have a large chance of being successful. But your team disagrees; you think it will most likely fail.
- A product/service soon to be launched or recently launched. The received wisdom (media, external reviews, senior managers, R&D people, etc) believes it will be a failure, or have a large chance of being a failure. But your team disagrees; you think it will most likely succeed.
- An unmet business opportunity based on hidden customers needs that nobody have addressed, and you can show it will provide a substantial reward for anyone who take up the effort to address the needs. You don't have to come up with the actual new products, but *it should be clear that people skilled in the relevant trade should be able to come up with a solution.* (so perpetual motion devices are out!)

A few words about your analysis:

- Your analysis (of the first two types) can be based on various aspects (and you don't need to have all of them), for example,
 - Key assumptions about consumers are wrong (WTP, benefit identified, preferences in general, etc)
 - Logic used by the firm in reaching their conclusion is flawed
 - Wrong marketing plan (wrong segmentation, incorrect segments targeted, and/or wrong positioning, inferior placement (channel), pricing...)
 - Lack of strategic consideration (how current and future competitors will act)
- You need to have some quantitative analysis, using either secondary data or/and collecting your own (preference) data, to support your conclusion.

We will judge the quality of your uCase on three dimensions:

- Degree of Difficulty
 - A problem where the right answer is obvious to the audience is not important
- Analysis
 - This is, given the case you have selected, how well you have done in analyzing the case and reach your conclusion.

- Impact
 - Is your conclusion/insight a big deal?

When your team will present:

- Randomly determined at the end of Week 1, after finalizing the teams.

Deliverables

- Present your case to the class. Each team will have 50 minutes. PowerPoint slides will be helpful in your presentation, but it's optional.

EVALUATION OF OTHER TEAMS' uCASE AND PROJECTS

The ability to provide insightful and constructive evaluations is a critical skill in NPD. Here is what you need to do:

- uCase
 - I will give you a copy of evaluation form for each presentation
 - Evaluate during presentation on difficulty, rigor of analysis, and potential impact
 - Hand it back to me after presentation
- Project
 - You need to evaluate all other teams' new products, as a potential investor
 - Email me your evaluation before the end of 12/7

GRADING

There is no exam. Your grade depends on team-based work and individual-based work.

Team Based Grade	65	
Project		
Deliverables (4X6)		24
Overall Quality (outcome)		16
Presentation		5
uCase		
Quality (Difficulty, Analysis, Impact)		15
Presentation		5
Individual Based Grade	35	
Attendance and Participation		10
Evaluation of uCase		10
Evaluation of Other Teams' Projects		15

TOTAL		100

Team Self-Evaluation

Please email me directly if you feel someone on your team is not doing his/her share of work (or any other problems). The team grade for a given team member may be adjusted downward based on these feedbacks, at my discretion.

You don't need to email me if there is no problem in your team.

Attendance and Participation

Absence is accepted with standard excuses (e.g., job interview, sick), but you need to email me in advance (unless it's impossible). You will lose 2 points for each unexcused absence. Since you have to be physically in class to participate (and evaluate the uCase presentations), even excused absence may affect your grade. Simple air-time does not count.

Laptop Policy

Laptops should only be used for class related activities.

ETHICS

We subscribe to the Smeal professional standards. Please arrive on time and I promise to end each class on time. Please maintain a professional atmosphere in class, including, but not limited to, making only respectful comments, refraining from non-course related activities, and avoiding disrupting class (side conversation, cell phone sound, etc).

It is expected that each student should contribute substantially to every team assignment.

HONOR CODE

We, the Smeal College of Business Community, aspire to the highest ethical standards and will hold each other accountable to them. We will not engage in any action that is improper or that creates the appearance of impropriety in our academic lives, and we intend to hold to this standard in our future careers.

ACADEMIC INTEGRITY STATEMENT

Please include the following statements in all written assignments (project, uCase, and project evaluation) to be handed in. You will lose 10% of the grade for an assignment if this is not included.

ACADEMIC INTEGRITY

I/We _____ affirm that I/We have neither given, utilized, received, nor witnessed unauthorized aid on this deliverable and have completed this work honestly and according to the professor's guidelines.

DELIVERABLES AND DEADLINES

Project (Team-Based, one copy from each team):

- Submit via email, Del. I, II, III, and IV, following the Master Schedule.
- Late submission will be accepted with 20% penalty
- Name your file as **542_NameofYourTeam_Project_?** (replace ? with I, II, III, or IV)
- Submit via email, with subject line as **542, Name of your team, Project, Del ?** (replace ? with I, II, III, IV)

uCase (Team-Based, one copy from each team):

- Submit the topic (email me) at least one week before presentation

Project Evaluation (Individual-Based):

- Due 11:59pm, 12/7 (last day of the class)
- Write your evaluation in a word file, name it as **542_YourName_Evaluation**
- Submit via email, with subject line as **542, Your Name, Evaluation**
- Late submission will be accepted with 20% penalty

uCase Evaluation (Individual-Based):

- Due in class after each presentation
- No late submission

Remember to include Academic Integrity Pledge in all Written Submissions (worth 10% of the grade for each assignment)

MASTER SCHEDULE

Minor changes might occur, and will be announced in class.

CLASS	DAY	DATE	LECTURE/CASE	UCASE/LECTURE**	PROJECT*
1	Tues	10/19	Introduction – Lock, Toothbrush, and other Fun Stuff		
2	Thurs	10/21	Market and Needs Identification		Finalize Team
3	Tues	10/26	Incentive Aligned Preference Measurement Methods		
4	Thurs	10/28	No Regular Class Team Consultation – Case and Project (45 min)		Del. I Due Before Meeting
5	Tues	11/2	Benefit Segmentation, Targeting and Positioning	Team Presentation	
6	Thurs	11/4	Idea Generation, Selection, and Patent Application	Team Presentation	
7	Tues	11/9	Testing and Launch	Team Presentation	Del. II Due
8	Thurs	11/11	Special Topic***	Team Presentation	
9	Tues	11/16	No Regular Class Team Consultation – Project (45 min)		Del. III Due Before Meeting
10	Thurs	11/18	Special Topic*** or Team Presentation	Team Presentation	
11	Tues	11/30	Special Topic***	Team Presentation	
12	Thurs	12/2	No Regular Class Market (Sell) Your Products (12-3 pm atrium)		
13	Tues	12/7	Project Presentation		Del. IV Due Before Presentation

* Due before the end of the day indicated on the left, unless otherwise stated.

** uCase topic due 1 week before presentation.

*** Special topics may cover, Pipeline and Portfolio Management, Innovation for Emotion, Innovation in China, Alternative Innovation Method, among others.

(OPTIONAL) READING LIST (DOWNLOAD FROM COURSE WEBSITE)

- R1. Press Release on ITB, Penn State University, 2003
- R2. Staples lets customers do the design. *Fortune*, April 18, 2005. p48.
- R3. Ding, Min, Shtaerman; Alexander, Scannell; Esther B., Almeida; Ian A. and Romano,J, Interactive Toothbrush Game, US Patent Application 20060040246.
- R4. Basche, T. and M. E. Pennell. 2003. Customizable combination locking system using textual combinations. US Patent 6,621,405.
- R5. Why P&G Smile is So Bright, *Business Week*, August 1, 2002
- R6. Get a patent, *WSJ*, May 9, 2005.
- R7. Urban and Hauser, 2004, Listening In to Find Unmet Customer Needs and Solutions, *Journal of Marketing*, 68, 72-78.
- R8. The Carriage Trade, *WSJ*, October 21, 2004
- R9. Toubia, 2005. Idea Generation, Creativity, and Incentives, *Marketing Science*
- R10. Ding M. and Eliashberg, J. 2002, Structuring the New Product Development Pipeline, *Management Science* , 48(3), 343-363
- R11. Template for Provisional Patent Application.
- R12. Urban, Weinberg, and Hauser. 1996. Premarket Forecasting of Really New Products, *Journal of Marketing*, 60, pp. 47-60
- R13. Dahan E. and J. Hauser. 2001. The Virtual Customer, *Journal of Product Innovation Management*, 19, 5, 332-54.
- R14. Hauser, J. R. and V. R. Rao. 2004. Conjoint Analysis, Related Modeling, and Application. in *Market Research and Modeling: Progress and Prospects: A Tribute to Paul Green*. Y. Wind and P. E. Green, Eds., Kluwer Academic Publishers: 141-168.
- R15. Ding, M. 2007. An Incentive Aligned Mechanism for Conjoint Analysis. *Journal of Marketing Research*.
- R16. Ding, M. et al. 2010. Unstructured Direct Elicitation of Decision Rules. *Journal of Marketing Research*, forthcoming
- R17. Ding, M. TOP 10 LIST OF SUBOPTIMAL NPD.
- R18. Ding, M. 2007. A Theory of Intraperson Games. *Journal of Marketing*.

APPENDIX 1. RELEVANT PSU POLICIES

Academic Integrity: According to the Penn State Principles and University Code of Conduct: Academic integrity is a basic guiding principle for all academic activity at Penn State University, allowing the pursuit of scholarly activity in an open, honest, and responsible manner. According to the University's Code of Conduct, you must neither engage in nor tolerate academic dishonesty. This includes, but is not limited to cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized possession of examinations, submitting work of another person, or work previously used in another course without informing the instructor, or tampering with the academic work of other students.

Any violation of academic integrity will be investigated, and where warranted, punitive action will be taken. For every incident when a penalty of any kind is assessed, a report must be filed, using the *pdf* form at this URL: <https://intranet.smeal.psu.edu/smeal/integrity/index.html> This form is used for both undergraduate and graduate courses. This report must be signed by both the instructor and the student, and then submitted to the Associate Dean for Undergraduate Programs in 202 Business Building.

Affirmative Action & Sexual Harassment:

The Pennsylvania State University is committed to a policy where all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by Commonwealth or Federal authorities. Penn State does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, gender, sexual orientation, or veteran status. Direct all inquiries to the Affirmative Action Office, 328 Boucke Building.

Americans with Disabilities Act:

The Smeal College of Business Administration welcomes persons with disabilities to all of its classes, programs, and events. If you need accommodations, or have questions about access to buildings where Smeal College activities are held, please contact us in advance of your participation or visit. If you need assistance during a class, program, or event, please contact the member of our staff or faculty in charge. Access to Marketing courses should be arranged by contacting the Department of Marketing Office: (814) 865 - 1869.

An Invitation to Students with Learning Disabilities:

It is Penn State's policy to not discriminate against qualified students with documented disabilities in its educational programs. If you have a disability-related need for modifications in your testing or learning situation, your instructor should be notified during the first week of classes so that your needs can be accommodated. You will be asked to present documentation from the Office of Disability Services (located in 116 Boucke Building; (814) 863-1807) that describes the nature of your disability and the recommended remedy. You may refer to the Nondiscrimination Policy in the *Student Guide to University Policies and Rules*.

APPENDIX 2. NEW PRODUCT DEVELOPMENT PROJECT

WHAT IS A GOOD NEW PRODUCT

The project is meant as an exercise to help you appreciate the new product development process, and create something with good financial potential.

SOME DOS AND DON'TS ON SELECTING AN OPPORTUNITY

First of all, this should be a realistic project. It should be real in the sense that you should have some familiarity with the potential customers of the product, based on your professional background, personal life, or hobbies. Furthermore, you should have access to a pool of potential customers.

It should be real such that your team will be able to make a small batch of your invention yourselves, or have someone do it within this time frame.

There should be a sizable market for your product. The market does not have to be huge, but it must be attractive enough. Your invention should ideally also have strong intellectual property. It should ideally not rely on other patents (otherwise you need to license these patents before you can practice your own invention), broad, and unlikely been circumvented by future patents.

If you have a "once in a lifetime idea", you may want to keep it to yourself and select an alternative market for the project.

QUANTITATIVE VERSUS QUALITATIVE APPROACHES

I will highlight a few quantitative tools in class that are very useful in product development. Due to time constraint, you are not required to employ quantitative approaches in developing your new product for this course. On the other hand, if you are interested in doing such analysis (which means you also need to collect more data than stated in this Appendix), please see me.

INTELLECTUAL PROPERTY RIGHTS

Each team will be able to retain the rights to any inventions you develop in this course. Teams should meet early and discuss how to distribute any economic rewards arising from the intellectual property you create.

PART 1. IDENTIFY THE MARKET AND UNDERSTAND THE CUSTOMERS

You need to first identify ONE potential market to enter. This market must be reasonably focused (e.g., *help children learn reading* is appropriate, but *game* is too broad and not appropriate). Once the team agrees upon the market, you need to listen to the voice of the customers in your chosen market, learn their needs, and ascertain which segments you want to target.

Step 1. Focus Group OR Interview

Conduct focus group (**1 group, 4-6 individuals**) OR interviews (**individually, 5 total**) in order to listen to the voice of customers, in particular, with regard to their experience and (unmet) needs in this market.

Step 2. (Benefit) Segmentation and Targeting

Different people, most likely, will tell you different needs. In other situations, market is already well developed and it is not clear upfront which consumer needs you should target. In these cases, a quantitative approach of segmentation is appropriate. In other cases, the major unsatisfied needs become clear after focus group study and you can make a decision to target these needs without going through the formal steps of segmentation. *For your project, you can (1) use judgment to decide which needs you will target, then (2) identify the demographics of the target segments.*

Deliverables I (format and page limit):

1. Specify the market you identified (*one sentence*).
2. Summarize insights from the focus group and/or interviews (*bullet points*).
3. Develop a list of common products and a list of attributes that customers generally use to describe products in this market (*bullet points*).
4. *Organize* a list of customer needs in this market (*bullet points*).
5. Define your target segments (based on the needs they have), justify your choice, and characterize the segments (the benefit the segments seek, their demographics, etc) (*half page*).

PART 2. PATENT SEARCH, CONCEPT GENERATION, AND PRELIMINARY CONCEPT SELECTION

You now have enough information about your market and target segments, and it's time to develop some specific ideas (while keeping in mind the needs/characteristics of the segment).

Step 1. Patent Search and Search for Existing Products

To ensure you do not reinvent the wheel, this is the time you do a thorough patent search at USPTO and general search on existing products/applications.

A useful website is <http://www.pat2pdf.org>, it will give you the complete patent in PDF format if you provide the patent number (which you can obtain from USPTO). You can also use Google Patent Search for this purpose.

Step 2. Idea Generation

Equipped with the knowledge from step 1, and the customer needs (benefits) that the team intends to satisfy, the team will proceed to generate new product concepts that will meet such needs. One possibility is follows: (1) break the target product into difference (2-4) components (e.g, A, B, C, D) using a criterion that is more appropriate for your product (e.g., think about the interactive toothbrush we discussed in class); (2) generate **2-3 alternative** sub-concepts for each of the components (e.g, A₁, A₂, A₃, for component A). We will discuss this in detail in class.

Step 3. Concept Selection

Follow the discussion on concept selection, identify the top **3 concepts** (e.g., A₁B₂C₁D₃) the team agrees are most promising from all possible combinations of the sub-concepts.

Deliverables II (format and page limit):

1. A summary of patent search and web search (*bullet points*).
2. The components you have decomposed and sub-concepts you have generated for each component (*bullet points*).
3. Detailed description and sketches of the top 3 concepts, what customer needs each address, and why you choose them (*maximum 2 page, excluding sketches*).

PART 3. FINAL NEW PRODUCT CONCEPT AND REFINEMENT

The goal here is to conduct marketing research and obtain customer reactions to your 3 concepts as well as competing products. This will help you to (1) identify the final concept and optimally position it (sometimes called identifying Core Benefit Proposition (CBP), see U&H), and (2) refine your new product concept. We could use several quantitative tools, e.g., conjoint analysis, to achieve this goal. For your project, however, you will use judgment instead (I will demonstrate state of the art practice of conjoint analysis in class).

Step 1. Concept Selection and Positioning

Take your final three concepts to **4-6** potential customers, and get their reactions to these concepts, relative to a set of competing products. Since your concepts target a specific unmet need (s) of one or more segments in the original market, you should only use individuals who belong to these targeted segments (you can use the same individuals from the focus group/interviews if they satisfy this criterion). Select the best concept based on the feedbacks and develop a positioning statement (CBP).

Step 2. Refinement

While a final concept should have been selected by now, there is still room for fine tuning. For example, you may want to decide what specific attribute (variations) you want to have in the final product (you should claim EVERYTHING in the patent application, but you should NOT implement everything in your product). Please refine the selected final concept based on the input from the potential customers in Step 1.

Deliverables III (format and page limit):

1. User responses to the concepts and competing products (4-6 users) (*bullet points*).
2. The selected final concept, its CBP, justify why you have selected it (*half page*).
3. Changes made, if any, to the final concept based on user input in step 1 (*bullet points*).

PART 4. (OPTIONAL PATENT APPLICATION), MAKING AND SELLING

Step 1. Optional Patent Application

You can file a provisional patent with USPTO if you believe the concept you created should be protected.

Step 2. Making the Products

This is the only step in the project that you can outsource to a third party, if your team so choose. Each team is expected to produce 10 units or more. But I will allow exception to the 10 minimum rule if you can justify it.

Step 3. Selling the Products

You can sell your products through any channels you deem to be appropriate, prior to the last class (when you do your presentation). You are expected to sell 10 units or more.

OUTPUT IV

1. One unit of your new product.
2. PowerPoint presentation.