Customer Management, Pricing, and Analytics
(7204.02 & 7219.02)

<table>
<thead>
<tr>
<th>Term 1: Satisfaction and Loyalty (7219.02)</th>
<th>Term 2: Pricing and Product Design (7204.02)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor: Dr. Nino Hardt</td>
<td>Professor: Dr. Mingyu (Max) Joo</td>
</tr>
<tr>
<td>Office: 556 Fisher Hall</td>
<td>Office: 558 Fisher Hall</td>
</tr>
<tr>
<td>Phone: 614-688-2996</td>
<td>Phone: 614-247-8845</td>
</tr>
<tr>
<td>Email: <a href="mailto:hardt.8@osu.edu">hardt.8@osu.edu</a></td>
<td>Email: <a href="mailto:joo.85@osu.edu">joo.85@osu.edu</a></td>
</tr>
<tr>
<td>Office hours: tba (&amp; by appointment)</td>
<td>Office hours: tba (&amp; by appointment)</td>
</tr>
</tbody>
</table>

- There will be separate grades for part 1 and part 2 -

Course Materials
- Case Studies (HBSP, [http://cb.hbsp.harvard.edu/cbmp/access/51454833](http://cb.hbsp.harvard.edu/cbmp/access/51454833)) (for part 2, pricing)
- Materials posted on Carmen

Schedule
TuTh 1:00PM-2:30PM @Gerlach Hall 265 (terms 1&2)

Motivation
This class will provide an applied approach to widely-used analytical techniques. On the technical side, the class will cover regression analysis, logistic regression and spreadsheet modeling. These techniques are applied to real data from real case studies, empowering students to apply these models when results do not look crystal-clear as in textbook applications. The real-life problems include the analysis of customer satisfaction and customer value, churn prediction, pricing and product configuration.
# Tentative Schedule

<table>
<thead>
<tr>
<th>w</th>
<th>#</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments / Readings</th>
</tr>
</thead>
</table>
| 1 | 1 | 8/23 | **Introduction, Customer Lifetime Value**  
We discuss what it means to view customers ‘as assets’. We learn how to compute the Customer Lifetime Value and Customer Equity and its relevance for customer management and retention. | - Managing Customers as Investments: The Strategic Value of Customers in the Long Run (Course pack)  
- Managing Customers for Profit (Course pack) |
| 1 | 2 | 8/25 | **Customer Management & Case 1**  
We continue the introduction to CLV and discuss the first case study. | - CRM: A Databased Approach - Customer Value Metrics (Course pack)  
- Case 1: Filene’s basement (Course pack) |
| 2 | 3 | 8/30 | **Logistic Regression**  
We learn about the most useful model for any MBA: the logistic regression model. In this class, we use it for customer management, in part 2 you will learn about an extension for use in pricing. | - Logistic Regression – Andy Field (Course pack) |
| 2 | 4 | 9/1 | **Lab – Logistic Regression**  
In class demonstration of the model, and time for you to start working on the first graded case study. | - Pilgrim Bank Case Study (Course pack, read before class, start analysis in class, finish at home) |
| 3 | 5 | 9/6 | **RFM – Recency, Frequency, Monetary Value**  
A common heuristic for identifying prospects for marketing campaigns or identify customers in danger of attrition | - Tuscan Lifestyles (see Carmen, read before class) |
| 3 | 6 | 9/8 | **Stochastic Models, Advanced models**  
We discuss the pros and cons of advanced models, which are easily applies using modern statistical software packages | |
| 4 | 8 | 9/13 | **CLV Modeling wrap up**  
We review RFM, Logistic regression and stochastic models, discuss model comparison | - Wrap up the final lab report in class |
| 4 | 8 | 9/15 | **Guest Speaker (Kathy Grigg, 84.51)**  
We learn about 84.51 (formerly known as DunnHumby) from a Fisher Alumna | |
| 5 | 9 | 9/20 | **Customer Satisfaction Surveys – Fundamentals**  
We cover the fundamentals of survey | }

---

**Tentative Schedule**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignments / Readings</th>
</tr>
</thead>
</table>
| 1     | 8/23  | **Introduction, Customer Lifetime Value**  
We discuss what it means to view customers ‘as assets’. We learn how to compute the Customer Lifetime Value and Customer Equity and its relevance for customer management and retention. |
| 1     | 8/25  | **Customer Management & Case 1**  
We continue the introduction to CLV and discuss the first case study. |
| 2     | 8/30  | **Logistic Regression**  
We learn about the most useful model for any MBA: the logistic regression model. In this class, we use it for customer management, in part 2 you will learn about an extension for use in pricing. |
| 2     | 9/1   | **Lab – Logistic Regression**  
In class demonstration of the model, and time for you to start working on the first graded case study. |
| 3     | 9/6   | **RFM – Recency, Frequency, Monetary Value**  
A common heuristic for identifying prospects for marketing campaigns or identify customers in danger of attrition |
| 3     | 9/8   | **Stochastic Models, Advanced models**  
We discuss the pros and cons of advanced models, which are easily applies using modern statistical software packages |
| 4     | 9/13  | **CLV Modeling wrap up**  
We review RFM, Logistic regression and stochastic models, discuss model comparison |
| 4     | 9/15  | **Guest Speaker (Kathy Grigg, 84.51)**  
We learn about 84.51 (formerly known as DunnHumby) from a Fisher Alumna |
| 5     | 9/20  | **Customer Satisfaction Surveys – Fundamentals**  
We cover the fundamentals of survey |
<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Note</th>
</tr>
</thead>
</table>
| 9/22 | 5-10 | Customer Satisfaction Surveys – Specifics  
We consider specific challenges of designing satisfaction surveys. |
| 9/27 | 6-11 | Case ISS |
| 9/29 | 6-12 | Driver Analysis  
We briefly review regression analysis and apply it to real satisfaction data. |
| 10/4 | 7-13 | Case Finale |
| 10/6 | 7-14 | Advanced Customer Satisfaction Analysis  
A brief look at the frontier in satisfaction research. |

Final exam part 1: Tuesday, October 11th at 1:00pm

### Part 2

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Note</th>
</tr>
</thead>
</table>
| 10/18 | 9-15 | Economic Approaches to Pricing I:  
Overview  
Traditional Approaches to Pricing |
| 10/20 | 9-16 | Economic Approaches to Pricing II:  
Cost- vs. Value-based pricing |
| 10/25 | 10-17 | Pricing and Quantitative Methods:  
Economic Theory of Demand  
Goal-Directed Pricing  
Usage of Purchase History Data and Conjoint Analysis  
- Due: In-class Regression Worksheet |
| 10/27 | 10-18 | Price Response Estimation:  
Log-Linear Demand Model  
Price Elasticity of Demand |
| 11/1 | 11-19 | In-class Pricing Exercise |
| 11/3 | 11-20 | Guest Speaker: Greg Rogers and Aaron Anderson (P&G) |
| 11/8 | 11-21 | Introduction to Conjoint Analysis:  
Consumer Willingness-To-Pay  
Conjoint Analysis and Pricing  
- A Practical Guide to Conjoint Analysis (HBSP)  
(Optional) Understanding Conjoint Analysis in 15 Minutes (Carmen) |
| 11/11 | 11-22 | Case 5: The Springfield Nor’easters (HBSP)  
- Due: In-class Pricing Worksheet |
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Case/Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>13/22</td>
<td>Conjoint Analysis and Product Design I: An Overview</td>
<td>Case 6: Portland Trail Blazers (HBSP)</td>
</tr>
<tr>
<td>13/23</td>
<td>Conjoint Analysis and Product Design II: Introduction to Sawtooth Discovery Design a Conjoint Experiment</td>
<td></td>
</tr>
<tr>
<td>14/24</td>
<td>Understanding Consumer Demand: Consumer Choice Modeling</td>
<td>Using Choice-Based Conjoint to Assess Brand Strength and Price Sensitivity (Carmen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Optional) A Short History of Conjoint Analysis (Carmen)</td>
</tr>
<tr>
<td>11/24</td>
<td>Thanksgiving (No class)</td>
<td></td>
</tr>
<tr>
<td>15/25</td>
<td>Putting Things Together: Launch Your Own Products!</td>
<td>Valuation of Patented Product Features (Carmen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Due: Interim Report of Final Project</td>
</tr>
<tr>
<td>15/26</td>
<td>Pricing a Portfolio of Products I: Complements and Substitutes</td>
<td>Case 7: Heinz Ketchup – Pricing the Product Line (HBSP)</td>
</tr>
<tr>
<td>16/27</td>
<td>Pricing a Portfolio of Products II: Complements and Substitutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If time permits Price Discrimination</td>
<td>(Optional) Case 8: Coca-Cola’s New Vending Machine (HBSP)</td>
</tr>
<tr>
<td></td>
<td>Final exam part 2 (tbd)</td>
<td></td>
</tr>
</tbody>
</table>
Part 1: Customers (7219)

The first half of this class focuses on applying the techniques to measuring customers. Over the last twenty years we have seen a shift from product or brand orientation towards customer orientation and customer centricity within most companies in any industry. The first move in that direction started in the 70s, when companies understood that focusing on transactions instead of customers ignored the advantages of managing a longer relationship with a customer. Eventually, the management of customers to create long-term profitable relationships emerged as a dominating paradigm.

As part of this process, companies became more interested in satisfying “the consumer”. Studies had shown that satisfied consumers exhibit higher retention rates, higher commitment and higher willingness to pay. This paved the way for extensive research on the drivers of satisfaction. Moreover, since the cost to serve a customer decreases with its tenure, long-term relationships with customers are even more appealing to customer management.

In the 90s and 2000s companies became more aware of the heterogeneity of consumers. Limited resources had to be used efficiently to satisfy consumers, thus targeting the most valuable customers first became essential. This gave rise to the concept of Customer Equity, the present value (=discounted Cash Flows) of the entire customer base. Today Customers are seen as intangible assets, which have to be managed as such.

Customer Relationship Management (CRM) was developed as a philosophy to implement this idea of managing long-term profitable relationships. However, in many instances CRM had been misunderstood as a solitary IT system, leading to frustration. The true key to success is customer centric thinking, beyond the implementation of an IT system. Another frequent misunderstanding is that CRM is about making all customers ‘happy’. Instead, it is about making the right customers happy.

The central concepts for this class are Customer Equity and Customer Lifetime Value, the forward looking value of a relationship with one customer. It accounts for all positive and negative cash flows with the customer. Different instruments can be used to understand the drivers of satisfaction and loyalty and manage the value of customers.

How this class makes you rich (helps maximizing your Customer Equity)

Metrics like customer satisfaction help to explain loyalty and profitability of customers. Low satisfaction scores are a forerunner of eventual churn. While satisfaction research is mostly based on surveys, new methods like Text Analysis are just about to emerge, using text data from social media. Companies frequently use driver analysis to identify and prioritize features of the products and services. However, the analysis of satisfaction data poses a number of challenges. The most important part is a proper survey design, minimizing bias. Besides, careful executing of regression analysis is used.
In contrast, many models of customer loyalty or retention focus on observed behavior, which has proven to be a more effective predictor of churn than survey-based attitudinal data, which underestimated the fact that many satisfied customers churn. The emergence of loyalty programs, designed to track individual level purchases, is one indicator of this trend. These models hinge on modeling CLV and its heterogeneity (observed and unobserved heterogeneity). Therefore this course focuses on the concept of CE, modeling CLV and customer retention and the design and analysis of customer satisfaction surveys.

**Guest**

Kathy Grigg (84.51) will talk about customer loyalty, in particular the Kroger Plus Card and how analytics have helped make Kroger very successful.

**Objectives**

This course part builds on the idea of managing customers from an equity perspective. It focuses on the analysis of customer satisfaction and loyalty as key issues for successfully managing customer relationships in the long run.

Conceptually, students will be familiar with
- the concept of customers as assets, the idea of Customer Lifetime Value and its relevance for shareholder value
- fundamentals of Customer Relationship Management, which provides the conceptual framework for the systematic analysis of satisfaction and loyalty
- the role of heterogeneity for managing customers
- theory of survey design
- Regression Analysis, Logistic Regression, a probability model of customer churn

On the application side, participants will learn the following skills:
- Designing customer satisfaction surveys
- Analyzing customer satisfaction data and identifying drivers
- Using retention models to analyze retention and predict CLV and to evaluate the performance of such models

**Course Format**

To achieve the course objectives we will use a combination of lectures, case discussions, articles, and guest speakers. A small project involves the design and analysis of a customer satisfaction survey. Class sessions will be devoted to probing, extending, and applying the material. Analysis of cases will form the basis for applying the concepts in real-world situations. You are expected to come well prepared for these class discussions.

**Lab Assignments**

In weeks 2, 3 and 4 we will learn about 3 key models classes: RFM, Logistic Regression and Stochastic Models. We will cover examples in class and develop answers together. After
learning about each model, you apply it to a real dataset from a charity organization. During weeks 2, 3, 4 you simply apply the models, and in week 4 you will compare the different model results and discuss implications.

**Case Studies**
Assignments for the case studies will be posted on Carmen and will include 1-3 questions. Write-ups need to be highly condensed. The first case study will be graded S/U, the remaining ones using regular grades.

**Final Exam**
Sample/Practice exam will be provided. The exam will consists of a mix of short answer and short essay questions.

**Grading**
As required by Fisher policy, grading will be based on relative rather than absolute standards. The average grade in this course will be a 3.5 or lower. A “B” (3.00) average in core courses and overall is required to earn a Fisher MBA degree from The Ohio State University.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Cases</td>
<td>30%</td>
</tr>
<tr>
<td>Exam</td>
<td>40%</td>
</tr>
<tr>
<td>Participation</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Part 2: Pricing and Products (7204)

The second half of this class focuses on optimal decision-making in pricing and product design.

Price setting is probably the most critical of all marketing mix decisions. It involves an understanding of both supply side factors (e.g. costs) and demand side factors (e.g. consumer willingness to pay). In addition, price is a unique category of the marketing mix as it is the only component that represents revenue for the firm. The remaining P’s (product, place, and promotion) are costly activities undertaken to create value for the consumer. Price, in its ideal form, recaptures this value.

Product design is also a critical decision to a firm’s success involving trade-offs between multiple attributes (e.g., combinations of colors, performance, sizes, etc.) and price.

While traditional approaches to pricing theory have revolved around an economic and financial framework, a broader and more pragmatic view entails a comprehensive understanding of the demand side; both at the level of individual customer values, and the more aggregate level of price sensitivities of the market.

In this course, we will approach the pricing and product decision as an integrated framework of economic, strategic, and marketing considerations. Using demand estimation methodologies, we will study how to recover consumers’ sensitivities to marketing variables including price and product attributes and their impacts on a firm’s profit. The data- and theory-driven optimal decision-making will not only reduce the risk of failure on the market but also ensure higher profits.

Guests:
Greg Rogers (P&G) will talk about pricing strategy and research on conjoint design and analysis in practice.

Objectives:
This course will introduce the students to frameworks relevant for making pricing and product design decisions. While pricing and product design strategies are taught under the rubric of many diverse disciplines, we will take an integrative approach, combining strategic, economic, and marketing considerations.

Upon successful completion of this course, you will

- be familiar with the concepts, theory and latest thinking on pricing and product design,
- learn the state-of-the-art framework for analyzing pricing and product design issues,
- gain a solid understanding of pricing practices across different industries, and
- master the essential techniques for making profitable (and optimal) pricing and product decisions with strategic thinking.
In addition, participants are required to master the following tool sets, particularly important in practical applications:

- Analyzing purchase history data to uncover patterns in consumer demand and elasticities to marketing mix variables
- Using price elasticity of demand to predict demand and make optimal pricing decisions
- Designing and analyzing conjoint studies to explore consumer preferences on hypothetical alternatives
- Estimating and analyzing consumer choice models to make optimal product attribute decisions

Course Format
Similar to the first half, we will use a combination of lectures, case discussions, articles, and guest speakers. A small project (or a comprehensive homework) involves the design and analysis of a conjoint survey to set optimal price and product attribute levels of a new product.

In class sessions, each topic will be started with materials that cover background information, theory and quantitative methodology. Most of class sessions will be devoted to probing, extending, and applying the materials.

Case discussions will include i) how to address specific questions from a firm’s situations, and ii) how to apply the techniques to resolve those problems.

In lab sessions, we will apply the techniques to either simulated or real-world data. Evaluations will be based on the quality of optimal decision that you made.

You are expected to come well prepared for these class discussions.

Course project
The course project will highlight two main challenges of conjoint analysis: 1) design of a choice-based conjoint survey and 2) analysis of the real data using choice modeling.

The goal of this project is to design your own product by setting the right price and attribute levels. This will include data collection from unanimous respondents, analysis of demand elasticities (both price and attributes), and optimal decision-making based on the results.

This will be a team project, and teams should consist of around 4 students. Similar to satisfaction survey in the first half, teams should decide on a product/service/brand to be studied. A hypothetical product of your own interest can be considered. The conjoint survey should be distributed online, and links can be communicated to students in the departments’ undergraduate classes.
The final deliverable is a report, containing the following elements:

- Introduction and problem definition, description of the business and challenges of that business
- Sketch of conjoint survey
- Results of data analysis
- Discussion of the results and optimal price and product attributes

**Case Studies**
Assignments for the case studies will be posted on Carmen. Write-ups need to be highly condensed. The first case study will not be graded.

**Final Exam**
Final exam will test your knowledge of all ideas covered in class. The exam will be closed-book and may consist of both quantitative and qualitative questions.

**Grading**
As required by Fisher policy, grading will be based on relative rather than absolute standards. The average grade in this course will be a 3.5 or lower. A “B” (3.00) average in core courses and overall is required to earn a Fisher MBA degree from The Ohio State University.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project (teams)</td>
<td>20%</td>
</tr>
<tr>
<td>Cases (pairs)</td>
<td>20%</td>
</tr>
<tr>
<td>In-class Assignments and Homework (pairs)</td>
<td>10%</td>
</tr>
<tr>
<td>Exam (individual/in-class/closed-book)</td>
<td>40%</td>
</tr>
<tr>
<td>Participation</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
**General information**

**SPSS**
We will need SPSS for the analysis of customer satisfaction data. You are also free to use a different statistical package, however, screenshots provided will be in SPSS.

Please follow the steps in the OCIO self-service (https://osuitsm.service-now.com/selfservice/) to obtain a license and download link.

If you have trouble, contact the IT Services Desk (Fax: 614-292-3299 or Email: 8help@osu.edu). The IT service desk is located in 025 Central Classrooms.

Additional information regarding this process and system requirements may be found here: http://oit.osu.edu/site_license/slwin.html#spss

You may also use other statistical packages; however, stattools and other excel-linked packages are too limited. However, SAS JMP or Minitab should do fine.

**Computer**
It is advisable that you work with your own laptop (if available). This way you can use the software within your own working environment. Both programs are available for both Windows and OSX. I will also order the mobile lab as a backup, but again, it is my experience that students work much faster with their own devices.

**Communication**
The best way to contact me outside class is via email. If you come to see me during my office hours, you do not have to make an appointment. If you need to see me at another time, please ask for an appointment via email.
I might use Carmen to contact you. Please make sure that you receive emails sent by the Carmen system.

**Class Participation and Attendance**
To make the learning process more beneficial and enjoyable, each one of you is expected to contribute to class discussions. This includes preparation for class by reading the text and cases, and presenting your opinions or summaries of material covered in class. The basis for class participation is quality, not quantity (hence, talking a lot alone does not get you a high grade for participation!). Attendance is a necessary but not sufficient condition for participation. If you do not actively participate, you will receive a low participation grade even if you attend every class.
You are neither expected to have all the right answers in every class, nor to dominate every in-class discussion. Furthermore, it is perfectly okay to disagree with me and your classmates as long as this is done in a civil and constructive manner.

**ACADEMIC INTEGRITY**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s *Code of Student Conduct* and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s *Code of Student Conduct* and this syllabus may constitute “Academic Misconduct.” The Ohio State University’s *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s *Code of Student Conduct* is never considered an “excuse” for academic misconduct, so I recommend that you review the *Code of Student Conduct*, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

In this course, it is also expected that each student will behave in a manner that is consistent with the Fisher Honor Statement, which reads as follows:

“As a member of the Fisher College of Business Community, I am personally committed to the highest standards of behavior. Honesty and integrity are the foundations from which I will measure my actions. I will hold myself accountable to adhere to these standards. As a future leader in the community and business environment, I pledge to live by these principles and celebrate those who share these ideals.” If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

**STUDENTS WITH DISABILITIES**

Any student who feels she/he may need an accommodation based on the impact of a disability should contact me privately to discuss specific needs. Please contact the Office for Disability Services at 614-292-3307 in 098 Baker Hall to coordinate reasonable accommodations for students with documented disabilities. It is your responsibility to discuss this with me well in advance of an assignment due date or an exam.