

Course purpose and content

This course focuses on the design strategy of innovative and sustainable products and services, and of the systems that create those products and services, with intent to satisfy the multiple objectives of a diverse set of organizational stakeholders. Case studies and a practicum on cutting-edge design practices are included.

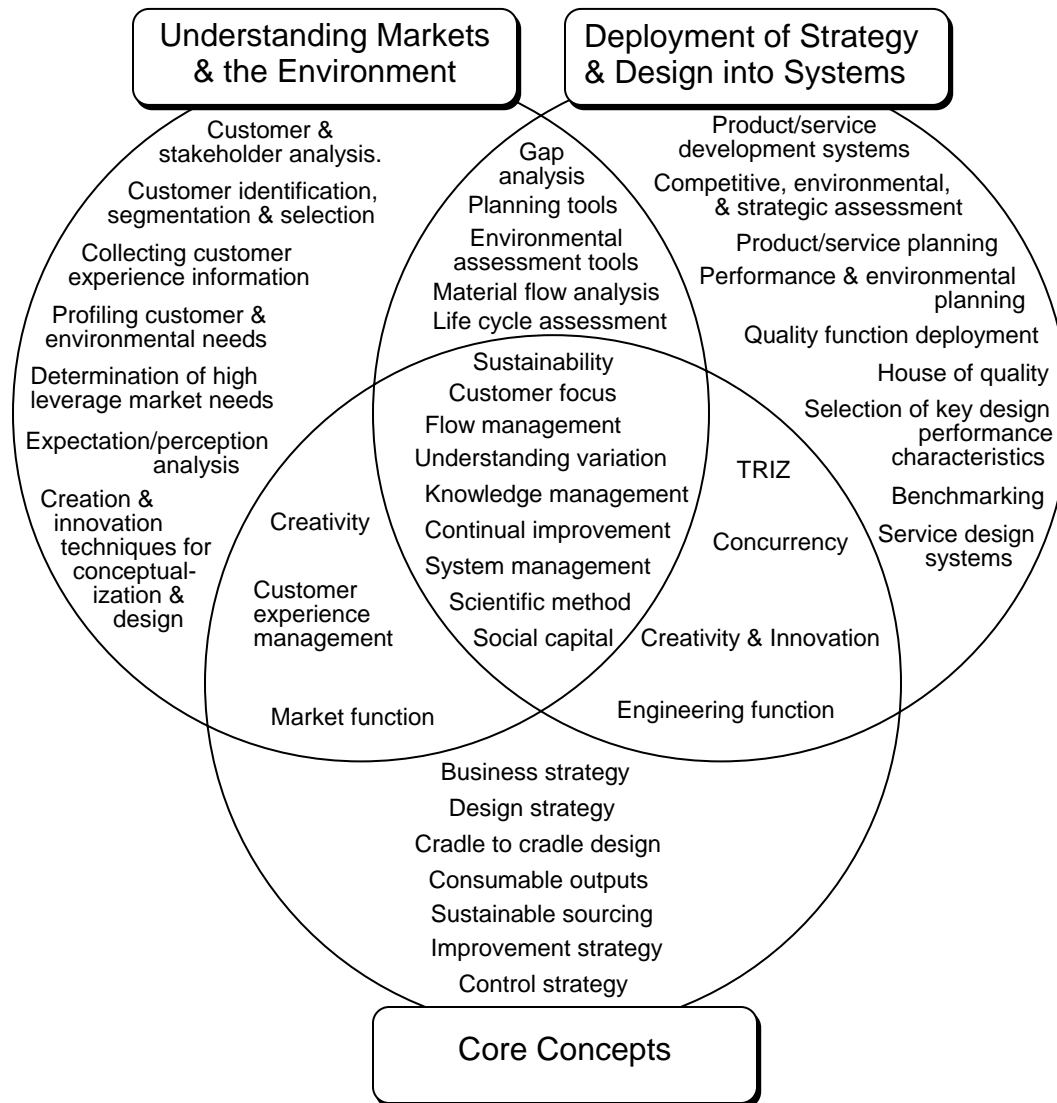
Why design? The design of a product/service determines 70-90% of the benefits related to sustainability, quality, cost and the triple bottom line as well as the material and energy flows associated with a product/service life cycle. Thus design strategy offers tremendous leverage for creating an organizational future that is both sustainable and that serves the organization's full spectrum of stakeholders.

Why sustainable? Non renewable resources are extracted from the earth, dispersed, and buried in toxic waste sites, depleting their supplies and limiting the ability of future generations to meet their needs. Renewable resources are a shrinking fraction of consumables, and are harvested at rates exceeding sustainable production, further eroding natural capital and extinguishing other species through toxic wastes and habitat destruction. Four and one-half billion people make less than \$5 per day while every baby, even in the most remote areas, is embedded with hundreds of known toxic chemicals although only a few thousand of the more than 80,000 human-made chemicals are tested today for toxicity. Business risks and legislation explode as scientists proclaim that the paradigm shift required for a sustainable future is more substantive in scale than both the industrial and scientific revolutions. This course discusses the business implications for these challenges, the new emerging form of management and cutting-edge practices that help organizations breakthrough toward a sustainable future.

Topics include breakthrough design strategy and methodology; sustainable design and design for the environment; cradle to cradle design; green sigma and design for six sigma; material and life-cycle flow analysis; collection, use and prioritization of lead, volume, loyal and strategic customer information around sustainability and innovation; environmental and customer benefit prioritization and profiling including identification of critical benefits unknown to customers; voice-of-the-customer translation technology for turning behavioral and environmental customer information into design requirements, including methodologies for analyzing customer settings, uses and critical events, leading to attractive innovative and sustainable features that have broad market appeal, even when the green market is small; creativity techniques and mechanisms for identifying attractive innovative and features and creating breakthrough designs; design planning that incorporates market and engineering benchmarking, sales and product strategy and competitive analysis using both economic and sustainability lenses; customer-focused sustainability deployment, quality deployment, cost deployment, reliability deployment, safety deployment, capability deployment and technology deployment; architectural considerations and mechanisms for design of a system for putting both sustainability and the customer focus into new services and products.

Content covers both conceptual strategies and "how-to" methodologies and mechanisms for customer-focused conceptualization and design of innovative services and products, and of the processes and job functions that will produce the products and deliver the

services. Emphasis is on upstream strategy, conceptualization and design since typically they lock-in most of the value (i.e., sustainability, quality and cost) that a product or service delivers. The products and services may be targeted either externally to markets or internally to the organization (i.e., job design).



The first part of this course discusses the evolution of management and innovation, including the challenges provided by sustainability. The second part of the course covers cutting-edge design principles and practices, and the embedding of design systems into both organizational strategy and operations. The third part of the course focuses on identification of the critical benefits that add the most value to both stakeholders and customers, often in areas that customers cannot articulate and do not understand, and the crafting of strategy for sustainable value creation that satisfies all stakeholders. The fourth part of this course discusses creativity and innovation around the development of breakthrough designs. The fifth part of the course describes deployment of design into

delivery systems, including mechanisms and approaches for design planning, and for identifying and linking critical design elements, parts, functions and delivery systems to enhance their value to the customer.

Prerequisites: A course or experience in either design, market research or improvement, such as BUS OTM 770.

Biographical sketch

Mark P. Finster is a faculty member in the Graduate School of Business and the College of Engineering at the University of Wisconsin-Madison, and a contributing member in the Gaylord Nelson Institute for Environmental Studies, the Center for Quality and Productivity Improvement, the Consortium for Global Electronic Commerce, the Global Studies Program and the Center for Quick-Response Manufacturing and. He also serves on the executive board of the Center for Operations and Technology Management.

Professor Finster has received the Gaumnitz Distinguished Faculty Award and the Mabel W. Chipman Excellence in Teaching Award and has helped improve the management systems of more than 150 businesses, government agencies, and nonprofit organizations from four continents.

Professor Finster received his Ph.D. from the University of Michigan and has served as a professor at Cornell and Johns Hopkins Universities. He is a five-time National Science Foundation (NSF) Scholar and chaired the NSF session that established a national research agenda in organizational excellence. He also serves as an associate editor of the American Society for Quality's journal on Quality Management, and on the Board of Directors at Home Savings Bank.

Teaching and research interests include sustainable design and improvement of complex systems, profit, value, agility, brand, market share and position, response time, quality, productivity, customer and stakeholder satisfaction, quality in work life, environmental management, creativity and innovation, strategic breakthrough, new product and service development, system-wide performance management, quality function deployment, employee involvement and empowerment, policy management and deployment, cross-functional management, learning organizations, benchmarking, structure and organization for performance management, and service management.

How to contact the professor

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Projects

Applied learning will occur during hands-on projects. There are several options. You may participate in a design project that either develops strategy around a new product or service prototype/concept, or that improves the system by which breakthrough customer benefits are deployed into a product or service. Alternatively, you may form a project to study an applied topic of your choice.

Biweekly team meeting with the professor

Meet with me to discuss project plans after each biweekly planning report. In addition, schedule meetings with me whenever needed to discuss plans and to address difficulties.

Planning reports

Each team's planning report describes your plans to complete your project and summarizes your accomplishments. In each report, include your current best set of recommendations for improving the product/service and the design process that will produce the product/service. The main purpose of these reports is to provide information necessary to support your project. The reports should be brief (about three to five typed pages plus charts, pictures, graphs and check sheets). Reports are due every two weeks beginning the first week of February. After each report, schedule a meeting with me to further discuss your project plans.

Final reports

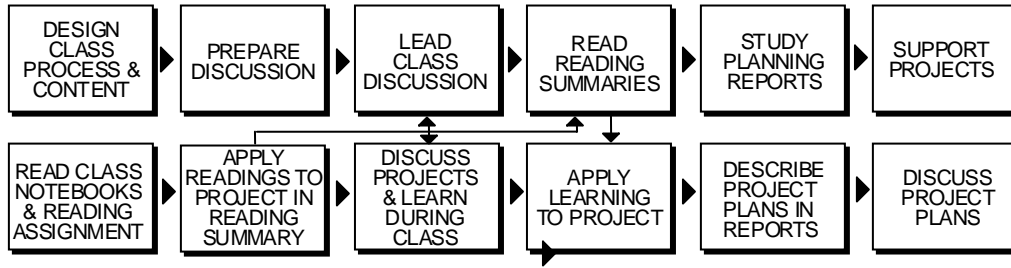
There is a final written report and an oral presentation. If appropriate, the oral presentation is made to the participating organization and to the whole class. A *draft* of the executive summary is due the 13th week.

Report Content

- Team composition
- Goals and expectations
- Design process
- Targeted customers, experiences & needs
- Competitive, environmental and market analysis, key design characteristics, and other key design information
- Description of product or service being developed
- Process that will produce the product or service
- Leverage areas in the design process
- Plans for rest of project
- Difficulties or bottlenecks

How the Course Flows

The map below describes regular flows of learning that occur during this course.



Weekly Reading Reports

On each Thursday, e-mail to me one-page providing your personal insights on how the readings might apply to your project, and on what you might do to help move your team forward. Please do not use an attachment. The reading reports provide a channel by which I can personally discuss your project with you as an individual. That regular weekly communication helps connect us together individually, beyond the team. The report also provides an opportunity to discuss your personal insights and interests. Each reading report has three distinct sections. The last two sections are most important.

1. Identify the reading's most important point that applies to your project.
2. Describe how this point applies uniquely and directly to your project or study topic. Include examples specific to your project that show how the reading's key point applies to your project. Write about issues the professor does not know.
3. Indicate a plan of action you, as an individual, will initiate to help your team make the application in (2) above occur. Share your report and integrate these ideas into your project.

Name Reading Project Date 1. Important point 2. Application to project & examples 3. Action you as an individual will take to help your team bring this important point alive.
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Report Format

Example: Reading report

An example of a sanitized reading report is given below.

Rachel Phang
Reading 6: Johnston & Daniel, Chapter 6
Organization X
October 17, 2008

Important Point

In the chapters by Johnston and Daniel, the authors discuss the importance of ongoing learning processes, and the need to address the gaps between goals and actual results obtained. Gaps must be tracked and addressed with great urgency as early in the deployment process as possible.

Application to project and examples

It appears that the review process in organizations X does not involve as many people in the organization as during the planning process. Review sessions are normally conducted between the Director and the various implementation groups separately, and updates or lessons learned are generally not circulated within the organization for learning. In fact, there have been cases where environmental initiatives were dropped but few in the organization were aware of it. Also, there is currently no review process in place to review the success or failure of past initiatives as input into the current planning cycle. Hence, many of the past Strategic Areas have just been carried forward to the current planning cycle without actual implementing improvement. Actual progress falls far behind plans.

I believe that organization x should therefore reexamine their review process, and treat it as critical as the planning process itself. Implementation plans should be finalized and circulated as part of the strategic plans document, with milestones, measures and budgets. Furthermore, as the article suggests, it is easy for inertia to set in once the formal planning process is over. Hence, organization x should plan for at least bi-monthly review sessions to ensure that assumptions and objectives continue to be appropriate, and to allow management to have early signs if initiatives are not being met, so that they can take timely actions to remedy it. More importantly, the review sessions should be considered as sources for lessons learned and identification of best practices, and can be considered critical input for action between review sessions, and for the next planning cycle.

Individual Action

The article gives great examples of simple and short tables that are used for summarizing review results. This ensures that review processes are efficient in gathering necessary data, and focus dialogue between management and implementers on key issues and hindrances. I will draft a rough prototype of similar tables and, during the next team meeting, suggest we use these at key points in the process. If this is chosen as an area of leverage, I will then design a glossary of terms and suggested methodologies for their use.

Grades

Grades will be determined on the following basis.

Projects	70%
Class participation	15%
Reading assignments	15%

Reading Assignments

Reading assignments are assessed in terms of how well they are applied to your project or study topic. A reading assignment with a high score would provide 1) examples that show specific application of the readings key points to your project, and 2) indications of what you as an individual might do to implement these ideas. In other words, a good reading report constructs examples specific to your project that exhibit how you can use the reading's key points to contribute to the team's project or study topic. Ideas in reading reports that are integrated into your project are very highly regarded.

Class participation

Class participation refers to involvement in the class discussion. Attendance is required for participation.

Projects

Projects are assessed according to the criteria below. Different criteria are used for the two different types of projects: development projects and study projects.

Criteria for evaluation of service/product-development and system improvement projects:

- | | |
|---|-----|
| 1. Participation (team and professor meetings, etc.) | 15% |
| 2. Effort (planning reports, special contributions, teamwork, etc.) | 25% |
| 3. Understanding (approaches, methods, tools) | 30% |
| 4. Results (product or service prototypes, or process redesign) | 30% |

The criteria above are further described below.

1. Participation involves attendance and participation at meetings with the organization, with the team and with the professor.
2. Effort refers to the quality of the planning reports and special contributions made to the team. Teamwork is also reflected here.
3. Understanding course materials, approaches, methods and tools

Understanding involves exhibiting knowledge and application in *some* of the following activities. Activities selected will be project specific.

- Development of a design strategy that effectively integrates business, sustainable, market and competitive perspectives.
- Development of an effective design system to carry out the design strategy and guide the organization and/or team

- Identification and consideration of a full spectrum of customers and stakeholder groups during market design and development.
- Development, verification and use of customer/stakeholder segmentation structures in the design process
- Prioritization of customer and stakeholder segments with appropriate method, criteria, logic and data
- Collection of a wide and rich array of customer information through a diverse and effective set of methods
- Extraction of potential design characteristics through voice of the customer and voice of the environment translation methods
- Prioritization of key customer and key environmental needs for each key customer segment
- Thorough and appropriate performance planning with adequate data
- Analysis, logic development and data use to extract key design performance characteristics
- Extraction of key design features and associated business planning to describe their business utilization
- Prototype and process development, including product service functions, technologies, parts, costs, reliability, operating requirements (e.g., knowledge and skills) and testing

4. Results are evaluated by the value and sustainability of the product, service or redesigned process to the organization, and the degree of improvement made.

Evaluation of study projects:

Participation (team meetings, etc.)	20%
Written and oral reports (see evaluation criteria in report 4)	80%

Schedule

The schedule below is flexible. Class notebooks are the main source of class material. The reading assignments provide necessary background information for the class notebooks and are available through MyUW. Supplementary readings provide greater depth as needed.

Week	Topics	Notebook Chapter	Reading Assignment
1	Introductions, overview syllabus, projects, evolution of management – first, second and third generation systems	1, 2 3	McDonough Diamond
2	Evolution of management – fourth generation systems, forces of changing shaping the new system	3	Lovins, Lovins & Hawken McDonough & Braungart
3	Emerging management approaches and sustainable design principles	3	McDonough Braungart Anastas & Zimmerman
4	Key concepts and principles for breakthrough design	4	Juran Kahn Ramaswamy
5	Design and organizational systems: daily management, strategic management, cross-functional performance management, new product and service development	5	Batalden Juran Orsato Ramaswamy Robert et al
6	Identifying and segmenting customers, sources of customer information, collecting customer information, surveys and interviews, analyzing customer behavior, case study: development of the point-and-shoot 35mm camera	6, 7	Juran Kahn
7	Dimensional approaches to service quality, determining demanded quality, translating the voice of the customer	7, 8	Zeithaml et al
8	Use analysis, voice-of-the-customer translation tables, turning demanded items into demanded quality, quality characteristics, functions, means, mechanisms, costs, reliability, etc.,	8, 9	Akao Ramaswamy

Schedule and Reading Assignments

Week	Topics	Note-book Section	Reading Assignment
9	Structuring customer needs, service gap analysis, prioritizing customer needs	9, 10, Appendix D	Juran
10	Strategic design, Kano technique	11	Finster, Eagan & Hussey
11	House of quality, performance planning, competitive analysis on customer needs, market strategy, developing performance characteristics, examining the relationship between customer needs & performance characteristics, developing a design plan, prioritizing performance characteristics, competitive analysis on performance characteristics, examining reliability issues, examining must-be performance items (safety, regulations, etc.), establishing preliminary design targets, bottleneck analysis, analyzing and designing the house of quality	12	Akao
12	Measuring performance characteristics, QFD in a service industry: a case study, quality assurance and QFD in service industries	13,14, 15	Akao, Kaneko, Ramaswamy, Kahn
13	Creativity: involvement in the creative process, environments for creativity,	16	Kahn
14	Creativity approaches for individuals and teams, creativity tools, TRIZ	16, 17	Juran OR Ramaswamy:
<i>Final Project Presentations 1 pm Friday, May 4th</i>			
15	Overview to benchmarking, QFD systems, basic QFD chart, transferring information from one chart to another, 4-phase Makabe system, automobile example, product hierarchy, reliability deployment	17, 18, 19	Juran AKao Ramaswamy:

Required Texts

Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Vols. I & II.

Readings

The following readings are available on electronic reserve via MyUW.

Week 1

Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapters 1 - 3.

Support readings

McDonough, William (2000). A boat for Thoreau: A discourse on ecology, ethics, and the making of things. Ruffin Series in Business Ethics. Charlottesville: 2000. p. 115, 19 pages.

Diamond, Jared (2008). What's Your Consumption Factor?

Supplementary readings

Behrens, Arno, Stefan Giljum, Jan Kovanda and Samuel Niza (2007). The material basis of the global economy: Worldwide patterns of natural resource extraction and the implications for sustainable resource use policies, *Ecological Economics*, 64, 444 – 453. Available at www.sciencedirect.com.

Kitagawa, Masayasu, Ryoichi Yamamoto and Kunio Ishihara eds. (2006). Science on Sustainability 2006: Summary Report: A View from Japan, *Research on the Scientific Basis for Sustainability*. Chapter 1.

Nadeau, Robert (2008). Brother, can you spare me a planet? *Scientific America*.

Sorensen, Jacob 2005. Ecological rucksack for materials used in everyday products, *NOAH – Friends of Earth Denmark*, www.noah.dk.

Business and Ecosystems (2006), published by Earthwatch Institute (Europe), World Business Council for Sustainable Development, World Resources Institute and The World Conservation Union (IUCN).

Week 2

Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 3.

Support readings

Lovins, Amory B., L. Hunter Lovins and Paul Hawken (1999). A road map for natural capitalism, *Managing for the Long Term*, *Best of Harvard Business Review*.

McDonough, William, and Michael Braungart (1998). The next industrial revolution, *Atlantic Monthly*, October, 82–92..

Supplementary readings

Batalden, Paul B., Paul B. Batalden (ed.) and Marjorie M. Godfrey (ed.) (2007). *Quality by Design: A Clinical Microsystems Approach*, Jossey-Bass Inc.

- Coleman, Katie (2007). Steelcase's strategy: For an environmentally sound, profitable business, *Industry Trendsetter*.
- Frey, Sibylle D., David J. Harrison and Eric H. Billett (2006). Ecological footprint analysis applied to mobile phones, *Journal of Industrial Ecology*, Vol. 10, Number 1-2. Available at <http://mitpress.mit.edu/jie>.
- Global Footprint Network (2008). Ecological footprint accounting: Building a winning hand. Available from info@footprintnetwork.org.
- Kitzes, Justin, Mathis Wackernagel, Jonathan Loh, Audrey Peller, Steven Goldfinger, Deborah Cheng and Kallin Tea (2007). Shrink and share: humanity's present and future ecological footprint, *Philosophical Transactions of the Royal Society B*.
- Wackernagel, Mathis, Chad Monfreda, Dan Moran, Paul Wermer, Steve Goldfinger, Diana Deumling, and Michael Murray (2005). National footprint and biocapacity accounts 2005: The underlying calculation method, Global Footprint Network, available from info@footprintnetwork.org.
- Schmidt-Bleek, F. (2002). Factor 10, Technological Choice, *Factor 10 Institute*, available from www.factor10-institute.org.
- World Business Council for Sustainable Development (2008). Measuring impact beyond the bottom line: Why measuring impact on society makes business sense. Available from the WBCSD, www.wbcsd.org/web/development.htm.
- Prahalad, C. K. and Stuart L. Hart (2002). The fortune at the bottom of the pyramid, *Strategy + Business*, issue 26.

Week 3

- Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 3, 4.

Support readings

- McDonough, William, Michael Braungart, Paul T. Anastas and Julie B. Zimmerman (2003). Applying the principles of green engineering to cradle to cradle design, *Environmental Science and Technology*, December.

Supplementary readings

- Giudice, Fabio, Guido La Rosa, and Antonio Risitano (2006). Design for the Environment: A Life Cycle Approach, CRC. *Proceedings of IDETC/CIE 2007, ASME 2007 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, September 4-7, 2007, Las Vegas, Nevada, USA.
- Graedel, T. E. (1998) *Streamlined Life Cycle Assessment*. Prentice Hall.
- Environmental Defense Fund (2008). Environmental Defense innovations review: Making the new green business as usual. Available from edf.org/InnovationsReview.
- McCarthy, Robert Jr 2005. Cost-effective supply chains: Optimizing product development through integrated design and sourcing, *IBM White Paper*.
- Pine, J. and Gilmore, J. (1999). *The Experience Economy*, Harvard Business School Press, Boston.

Week 4

Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 4.

Support Readings

Juran, J. M. (1992). *Juran on Quality by Design*. Simon Schuster. Chapter 1.

Kahn, Kenneth B. (2001) *Product Planning Essentials*, Sage Publications, London. Chapters 1, 2.

Ramaswamy, Rohit (1996). *Design and Management of Service Processes: Keeping Customers for Life*, Prentice Hall. Chapter 1.

Supplementary readings

Harryson, J. Sigvald, Rafal Dudkowski and Alexander Stern (2008). Transformation networks in innovation alliances – The development of Volvo C70., *Journal of Management Studies* 45:4 June 2008 0022-2380.

Henri, Jean-Francois and Alexandre Giasson (2006). Measuring environmental performance, *CMA Management*, 28-32.

Kahn, Kenneth B. (2001) *Product Planning Essentials*, Sage Publications, London. Chapter 3.

Ramaswamy, Rohit (1996). *Design and Management of Service Processes: Keeping Customers for Life*, Prentice Hall. Chapter 11.

Schmitt, Brent (2003). *Customer Experience Management*, Wiley and Sons.

Brunetti, Wayne H. (1993). *Achieving Total Quality*, Quality Resources, White Plains, New York. Chapters 3 - 4.

Week 5

Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 5.

Support Readings

Batalden, Paul B., Paul B. Batalden (ed.) and Marjorie M. Godfrey (ed.) (2007). *Quality by Design: A Clinical Microsystems Approach*, Jossey-Bass Inc.

Juran, J. M. (1992). *Juran on Quality by Design*. Simon Schuster. Chapters 2, 3.

Orsato, Renato J. (2006). Competitive environmental strategies: When does it pay to be green? *California Management Review*, Vol. 48, No. 2.

Ramaswamy, Rohit (1996). *Design and Management of Service Processes: Keeping Customers for Life*, Prentice Hall. Chapter 2.

Robert, K.-H., B. Schmidt-Bleek, J. Aloisi de Larderel, G. Basile, J. L. Jansen, R. Kuehr, P. Price Thomas, M. Suzuki, P. Hawken and M. Wackernagel (2002).

Strategic sustainable development – selection, design and synergies of applied tools, *Journal of Cleaner Production* 10, 197-214. Available at www.cleanerproduction.net.

Supplementary Readings

- Donnelly, Kathleen, Arjen Salemink, Frederick Blechinger, Albrecht Schuh, and Theresa Boehm (2005). A product-based environmental management system, *Greener Management International*, Greenleaf Publishing.
- Esty, Daniel and Andrew S. Winston (2006). Natural drivers of the green wave (Chapter 2) and Who's behind the green wave? (Ch 3) in *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value and Build Competitive Advantage*, Yale University Press.
- Everard, Dr Mark, Dr Caroline Gervais and Dr Conor Linstead (2002). Towards the sustainable use of material resources: An evaluation using the natural step framework, *The Natural Step*, June.
- Gray, Casper and Martin Charter 2008. Remanufacturing and Product Design
- Maxwell, James, Sandra Rothenberg, Forrest Briscoe and Alfred Marcus (1997). Green Schemes: Corporate environmental strategies and their Implementation, *California Management Review*, Vol. 39, No. 3.
- Pine, J. and Gilmore, J. (1999). *The Experience Economy*, Harvard Business School Press, Boston.
- Roome, Nigel John and Ronald Bergin (2006). Sustainable development in an industrial enterprise: the case of Ontario Hydro, *Business Process Management Journal*, Vol. 12, No. 6, pp. 696-721. Available at www.emeraldinsight.com/1463-7154.htm.
- Schmitt, Brent (2003). *Customer Experience Management*, Wiley and Sons.
- Specter, Michael 2008. Bigfoot: In measuring carbon emissions it is easy to confuse morality and science, *The New Yorker*, Feb 25.
- Fishbein, Bette K., John R. Ehrenfeld, and John E. Young 2000. Extended Producer Responsibility: A Materials Policy for the 21st Century,
- Toffel, Michael W. 2004. Strategic management of product recovery, *California Management Review*, vol. 46, no. 2.
- Willians, Eric, Ramzy Kahhat, Brad Allenby, Edward Kavazanjian, Jun Beumkim, and Ming Xu. 2008. Environmental, social and economic implications of global reuse and recycling of personal computers, *Environmental Science and Technology*, 42, 6446-6454.

Week 6

- Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 6, 7.

Support Readings

- Juran, J. M. (1992). *Juran on Quality by Design*. Simon Schuster. Chapters 4, 13.
- Kahn, Kenneth B. (2001) *Product Planning Essentials*, Sage Publications, London. Chapter 4.

Supplementary Readings

- Bliss, J. (2006) *Chief Customer Officer*, Jossey-Bass, San Francisco.

- Burchell, Gary and Christina Hepner Brodie (1997). *Voices into Choices: Acting on the Voice of the Customer* by Center for Quality Management, Joiner Publications. Chapters 1 - 13.
- Dickson, Peter R. (1998). *Marketing Management* Thomson Learning. Chapters 2-3.
- Giudice, Fabio, Guido La Rosa, and Antonio Risitano (2006). *Design for the Environment: A Life Cycle Approach*, CRC.
- Graedel, T. E. (1998) *Streamlined Life Cycle Assessment*. Prentice Hall.
- Schmitt, Brent (2003). *Customer Experience Management*, Wiley and Sons.
- Kahn, Kenneth B. (2001) *Product Planning Essentials*, Sage Publications, London. Appendix A.
- Pine, J. and Gilmore, J. (1999). *The Experience Economy*, Harvard Business School Press, Boston.
- Urban, Glen L. and John R. Hauser (2004). *Design and Marketing of New Products..* Pearson Custom Publishing.

Week 7

- Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 7, 8.

Support Readings

- Zeithaml, V. A., A. Parasuraman and L. L. Berry. (1990). *Delivering Quality Services*. Simon and Schuster. Chapter 2.

Supplementary readings

- Giudice, Fabio, Guido La Rosa, and Antonio Risitano (2006). *Design for the Environment: A Life Cycle Approach*, CRC.
- Graedel, T. E. (1998) *Streamlined Life Cycle Assessment*. Prentice Hall.
- Pine, J. and Gilmore, J. (1999). *The Experience Economy*, Harvard Business School Press, Boston.
- Ramaswamy, Rohit (1996). *Design and Management of Service Processes: Keeping Customers for Life*, Prentice Hall. Chapter 4.
- Schmitt, Brent (2003). *Customer Experience Management*, Wiley and Sons.
- Zeithaml, V. A., A. Parasuraman and L. L. Berry. (1990). *Delivering Quality Services*. Simon and Schuster. Whole book.

Week 8

- Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapter 8, 9.

Support Readings

- Akao, Yoji ed. (2004). *Quality Function Deployment: Integrating Customer Requirements into Product Design*, Productivity Press. Chapter 1.
- Ramaswamy, Rohit (1996). *Design and Management of Service Processes: Keeping Customers for Life*, Prentice Hall. Chapter 3.

Supplementary readings

- Bliss, J. (2006) *Chief Customer Officer*, Jossey-Bass, San Francisco.
- Giudice, Fabio, Guido La Rosa, and Antonio Risitano (2006). *Design for the Environment: A Life Cycle Approach*, CRC.
- Graedel, T. E. (1998) *Streamlined Life Cycle Assessment*. Prentice Hall.
- Mizuno, Shigeru (ed.) (1988). *Management for Quality Improvement: The Seven New QC Tools*, Productivity Press. Chapters 1 - 3.
- Pine, J. and Gilmore, J. (1999). *The Experience Economy*, Harvard Business School Press, Boston.
- Schmitt, Brent (2003). *Customer Experience Management*, Wiley and Sons.

Week 9

- Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapters 9, 10, Appendix D.

Support readings

- Juran, J. M. (1992). *Juran on Quality by Design*. Simon Schuster. Chapter 5.

Supplementary readings

- Zeithaml, V. A., A. Parasuraman and L. L. Berry. (1990). *Delivering Quality Services*. Simon and Schuster. Chapters 3-9.
- Mizuno, Shigeru and Yoji Akao, eds. (1994). *QFD: The Customer-Driven Approach to Quality Planning and Development*, Asian Productivity Organization, Hong Kong. Chapter 4.
- Saaty, Thomas L. (1999). *Decision Making for Leaders: The Analytic Hierarchy Process in a Complex World*, RWS Publications..
- Urban, Glen L. and John R. Hauser (2004). *Design and Marketing of New Products..* Pearson Custom Publishing.

Week 10

- Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapters 11.

Support readings

- Finster, Mark, Patrick Eagan and Dennis Hussey (2002). Linking industrial ecology with business strategy: Creating value for green product design, *Journal of Industrial Ecology*, Vol. 5, No. 3, pp. 89-108.

Supplementary readings

- Kano, Noriaki, Nobuhiko Seraku, Fumio Takahashi, and Shin-ichi Tsuji (1984). 'Attractive Quality and Must-Be Quality'. *Hinshitsu*, 1984, Vol. 14, No. 2, pp 147-156.

Schvaneveldt, Shane J., Takao Endawa, and Masami Miyakawa (1991). "Consumer Evaluation Perspectives of Service Quality: Evaluation Factors and Two-Way Model of Quality". *Total Quality Management*, Vol. 2, No. 2.

Week 11

Finster, Mark P. (2009). *Breakthrough Products and Services: A Sustainable Approach*, Chapters 12.

Support readings

Akao, Yoji ed. (2004). *Quality Function Deployment: Integrating Customer Requirements into Product Design*, Productivity Press. Chapters 1, 2, 3.

Supplementary readings

Burchell, Gary and Christina Hepner Brodie (1997). *Voices into Choices: Acting on the Voice of the Customer* by Center for Quality Management, Joiner Publications. Chapters 18 - 20.

Hofmeister, Kurt R. *Quality Function Deployment, Transactions from the Third Symposium on Quality Function Deployment*, QFD Institute, Ann Arbor, Michigan, pgs. 18 - 83.

Juran, J. M. (1992). *Juran on Quality by Design*. Simon Schuster. Chapter 6.

Kahn, Kenneth B. (2001) *Product Planning Essentials*, Sage Publications, London. Chapter 7, 8.

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