MGSC 893

BUSINESS ANALYSIS, DESIGN, AND IMPLEMENTATION

a.k.a.

BUSINESS PROCESS IMPROVEMENTS

COURSE SYLLABUS

TERM

Fall 2010 (August 19 – December – December 11)

CLASSROOM

Moore School of Business – BA 701

CLASS TIME

Tuesday and Thursdays (11:00 a.m. – 12:15 p.m.)

PROFESSOR

Dr. Sanjay Ahire, Professor of Operations Management

OFFICE

Moore School of Business 709

CONTACT

Cell : 803-873-3376; Fax: 803-777-3064,
Email: ahire@moore.sc.edu; drsanjayahire@gmail.com

OFFICE HOURS

Wed 11:00 a.m. – 2 p.m.

You can also set up a prior appointment at other mutually convenient times on weekdays. You can call me with questions if you can’t see me during office hours. For simple questions or clarifications, emails might be ok.

COURSE DESCRIPTION:

Since the 1990s, numerous organizations around the world have adopted the “business process” perspective of operations to significantly improve their operations, market, and financial performance. Examples of business processes include order fulfillment in manufacturing firms and fast-food restaurants, patient treatment in hospitals, loan processing in banks, and customer calls processing in call centers. Organizations now, more than ever, value managers with a cross-functional business process perspective. Business process improvement initiatives form the backbone of several key organizational change initiatives such as TQM, Business Process Reengineering, and Six-Sigma campaigns.

The primary objective of this course is to learn to apply the concepts and techniques of business process analysis and improvements as building blocks for all operations improvement strategies. Students will learn how to analyze and improve business
processes in different contexts, and using different process improvement tools. They will learn tools from simple process-mapping to value-stream-mapping to computer-based process-modeling using ProcessModel™, a state-of-the-art software. Fundamental concepts that can be used to systematically analyze any business process will be covered. Use of sophisticated analytical techniques to design and manage efficient and effective operations and processes will be covered. The importance of balancing technical/analytical and organizational/behavioral aspects of business process improvements will be highlighted through guest lectures and/or class discussions.

Students will learn and practice principles and techniques/tools of Lean and Six-Sigma Approach to business process improvements. This is in light of the pervasive implementations of six-sigma campaigns in various sectors. Note however that the treatment of topics will be balanced and the focus will be on developing the mindset and fundamental competencies for process improvement that extend well-beyond any one “brand” of process improvement initiative.

**COURSE CONTENT LEARNING OBJECTIVES**

1. To understand the “business process perspective of operations” and its critical importance of process management in manufacturing and service organizations in successfully executing their competitive strategies.

2. To learn concepts and tools of “lean” strategy.

3. To learn concepts and tools of “six-sigma” strategy.

4. To learn analysis of complex processes with interactions between various process elements (resources, process logic, customers) and variations through the use of a state-of-the-art computer-based process-modeling software tool.

5. To understand the role of business process management in operations improvement strategies and to understand the role of organizational culture and change management during business process improvement.

**COURSE MATERIAL:**


4. ProcessModel software [Optional]: This is a stand-alone computer-based process simulation modeling software. Students should buy – if desired – the current “120-Day Student Version” of the full software directly from ProcessModel Corporation. The details are on the processmodel website ([http://www.processmodel.com/](http://www.processmodel.com/) in the “Academic Programs and Pricing” section). The purchase of the software entitles the student to the use of the full commercial version of the software for 120 days, along with a print copy of the self-teaching booklet. *Alternatively, free trial download for 14 days is available.*

Students need to have access to a computer that can load the software. See the website for computer system requirements. The relevant page from the Website (as of May 2007) is displayed below:

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**Software Website**: [http://www.processmodel.com/](http://www.processmodel.com/)

**Software Online Store**: [http://store.processmodel.com/](http://store.processmodel.com/)

### Educational Pricing

#### Standard Educational Packages

**120-Day Student Version** - This version is limited to 120 days of use. There is no limitation on the size of the model. This version includes an electronic copy of the user manual and a hard copy of the new self-teaching booklet. Click here to view the booklet.

Price - $69 per copy plus shipping and handling.

#### Purchasing Educational Packages

ProcessModel accepts payment in the form of Mastercard, Visa, or American Express for all educational packages.

Students wishing to purchase their own version of ProcessModel may do so by credit card only. Students wishing to purchase ProcessModel academic version may do so by receiving a link to our online store from their instructor. If the instructor does not have this information, then have the instructor email us at academic@processmodel.com to receive this information. In order to qualify for the packages and pricing outlined here you must be a qualified educational institution or a student of a qualified educational institution.

For further information please contact our educational advisor, at academic@processmodel.com or 801-356-7165, option 5.
COURSE DELIVERY / EXECUTION

The course will be delivered as a combination of lectures, discussions, and hands-on learning of process modeling techniques. It will be split into three parts: Lean and Theory of Constraints; Six-Sigma; and Advanced Computer-Based Process-Modeling.

Course Component 1: Lean, TOC, and Six-Sigma (70% of the Grade)

This course component will involve coverage of concepts, strategies, tools and techniques of lean and six-sigma process improvement strategies. We will use both the textbook (Evans and Lindsay) and the reference book “Lean Six-Sigma Pocket Toolbook” (George et al.) for this component to learn the lean-six-sigma approach to process improvement. This will be supplemented with my lecture notes.

There will be three exams to test this component: Exam 1 (Lean and TOC): 20%; Exam 2 (Six-Sigma): 30%; and Exam 3 (Combination of Lean, TOC, and Six-Sigma Topics): 30%

Practice Homework Problems on Lean and Six-Sigma

Periodically, practice problems will be assigned for homework. These will not be graded. Answers will be made available afterwards as necessary. Note that it is important to practice the problems on your own, as these will help you perform better on exams.

Course Component 2: Computer-Based Process Simulation Modeling (30% of the Grade)

Leading organizations have started to incorporate sophisticated data-based computerized process models to account for statistical variations in various parts of the business processes and complex interactions between various elements (resources and customers) of the processes. These modeling capabilities can allow an organization to evaluate the net impact of several process improvement tactics on the key process performance metrics with substantially more confidence and consequent payoffs.

I will teach this approach to process analysis and improvement with the help of hands-on instruction on “ProcessModel™,” a cost-effective yet powerful process-modeling software that is fast becoming a platform of choice in sophisticated lean and six-sigma campaigns.

Classwork ProcessModel Workshop

We will learn the software in the class and outside using an extended workshop I have developed. This will be followed by an extensive ProcessModel Case Assignment. It will be given as a separate handout at an appropriate time during the semester.
**A Real/Realistic Process Improvement Project (30% of the Course Grade)**

Objective of the Project: The purpose of the project is to demonstrate your understanding of “business process management” issues with respect to a process of your choice. The process can be a real process that you have identified through your contacts, or one that you are familiar with based on your past experience.

The project can be based on a realistic but not necessarily a live business process. I don’t want to bind you into a “live” consulting project with actual data collection requirements and reporting back to the client. (You will have an opportunity to conduct a “live” project in MGSC 897: Capstone OM Project).

**Project Team**

You should work on the project in teams of up to four members. Note that this means you could decide to work alone or in smaller teams. The work quality will be assessed relative to the team size. Also, if you are working in teams, your project grade may be partly adjusted from the “group’s project grade” upward or downward based on your participation in the project as assessed by the other team members.

You will have to inform me of your team composition by September 9. Please email me with your team members’ names and the project idea (the selected process to be modeled).

**Project Steps:**

1. You can start work on the project after we have completed ProcessModel Training workshop. You should review the example models in Demo directory of ProcessModel software to help you in developing your projects.

2. Identify process elements, process performance measures, and drivers of process performance for the “selected” process (e.g., a fast food restaurant, an emergency room, a manufacturing job-shop, an assembly line, or a bank or a supermarket, etc.).


4. Identify and model realistic improvements (e.g., changing resource capacities, increasing activity speeds, reducing variability in activity times, bottleneck scheduling, and changing process logic). Write a Section on “Process Improvement Scenarios and Results”. Where possible, do a cost-benefit analysis of scenarios and identify the most promising scenario(s).
(5) Submit the Project Report to me on the Final Exam Day. The Project Report should be organized as follows:

(1) Current Process Description: Customers, Process, Critical Performance Outcomes (Ys); Resources; Logic of Customer Flow, Time Patterns, and Resource Usage. (Refer to Current Model – Appendix A).

(2) What are the measurements that you have to make for analyzing this process (exact definitions of Xs and Ys)

(3) Process Improvement Criteria and Target.

(4) Strategies/Scenarios Analyzed (Refer to Modifications 1, 2, 3, etc. – Appendix B) to improve process from current state performance to future state performance.

(5) Summary of Analyses: Prepare a Table of Comparisons.

(6) Conclusion.

CLASS ATTENDANCE

I strongly encourage students to attend all class sessions, except attendance at the career fairs. Please let me know in advance if you must miss a class. Exam make-ups will be evaluated on a case-by-case basis on its merit. I reserve the right to deny a make-up exam to a student.

ETHICAL STANDARDS

Organizations and managers are coming under an increasing scrutiny in terms of their professional and business ethics and social responsibility. Students must view their academic work as an integral part of meeting these ethical standards in their current / future careers. I expect all students to adhere to the highest ethical standards. If anyone chooses to act in an unethical manner (e.g., plagiarism, cheating on exams, free-riding on projects, etc.), there will be a substantial impact on the grade for that component of the course or more. For example, free-riding on team projects based on an evidence (triangulated assessment based on peer evaluation and my assessment) can lead to a zero on that component (15%) leading to a grade reduction of at least one letter grade.
# SUMMARY OF COURSE COMPONENTS AND GRADING

<table>
<thead>
<tr>
<th>Component</th>
<th>Date or Due Date</th>
<th>Weight (% of the course grade)</th>
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<tbody>
<tr>
<td>Mid-Semester Exam</td>
<td>OCTOBER 12</td>
<td>35%</td>
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<tr>
<td>Final Exam</td>
<td>DECEMBER 11 (9am – 11am)</td>
<td>35%</td>
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<tr>
<td>Final Exam Day - ProcessModel Team Project Due (and Peer Evaluations)</td>
<td>DECEMBER 11</td>
<td>30%</td>
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## GRADING SCALE

- A = 90 or higher
- B+ = 87-89.99
- B = 80-86.99
- C+ = 77-79.99
- C = 70-76.99
- D+ = 67-69.99
- D = 60-66.99
- F = under 60
# MGSC 893: “TENTATIVE” CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reference Material</th>
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<tbody>
<tr>
<td>August 19</td>
<td>Syllabus Discussion and Course Requirements</td>
<td>(Please browse the reference material before the class date)</td>
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<tr>
<td>August 19, 24</td>
<td>Business Process Analysis Fundamentals</td>
<td>Powerpoint Presentations</td>
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<td>Process Mapping and Analysis Methods</td>
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<td></td>
<td><strong>Part 1 – Advanced Process Modeling</strong></td>
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<tr>
<td>August 24, 26, 31, September 2</td>
<td>ProcessModel\textsuperscript{TM} Workshop</td>
<td>Uncle Ted Oil Change Case; ProcessModel Software Website <a href="http://www.processmodel.com">www.processmodel.com</a>; ProcessModel past Project Examples</td>
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<tr>
<td>December 11</td>
<td>ProcessModel Group Project Report and Peer Evaluations Due</td>
<td>30%</td>
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<td></td>
<td><strong>Part 2 – PI Principles, TOC, and Lean Approach</strong></td>
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<tr>
<td>September 7, 9, 14, 16</td>
<td>Key Process Performance Metric</td>
<td>Lecture Notes and Powerpoints</td>
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<td>Process Flow Times Calculations</td>
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<td>Process Throughput Capacity Calculations</td>
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<td>Linear Programming Application for Process Value Optimization</td>
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<tr>
<td>September 21, 23, 28, 30</td>
<td>Value Stream Mapping</td>
<td>Lecture Notes; George et al. Chapter 3; Chapter 9 and Chapter 10; “Learning to See” (from Lean.Org)</td>
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<td>(The Tool and the Lean Concepts)</td>
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<td>Cellular Layout</td>
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<td>Finished Goods Inventory &amp; WIP-Kanbans</td>
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<td>Level Loading &amp; Mixed Model Scheduling</td>
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<td>October 12</td>
<td><strong>MID-SEMESTER EXAM</strong></td>
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<td><strong>Part 3 – Six-Sigma Approach and Tools</strong></td>
<td>Each phase will be discussed with powerpoints and examples; please also review appropriate chapters of Evans &amp; Lindsay.</td>
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<td>October 5, 7</td>
<td>Six-Sigma: DMAIC - DEFINE Phase</td>
<td>Evans &amp; Lindsay: Chapters 1, 2, and 3 George et al. Chapters 1, 2, 3</td>
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<td>October 7, 12, 19</td>
<td>Six-Sigma: DMAIC – MEASURE Phase</td>
<td>Evans &amp; Lindsay: Chapter 4 George et al. Chapters 4 and 5</td>
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<tr>
<td>October 21, 26, 28, November 4</td>
<td>Six-Sigma: ANALYZE Phase</td>
<td>Evans &amp; Lindsay: Chapter 5 George et al. Chapters 6 and 7</td>
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<td>November 9, 11</td>
<td>Six-Sigma: DMAIC – IMPROVE Phase</td>
<td>Evans &amp; Lindsay: Chapter 6 George et al. Chapter 8 (Self Study)</td>
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<td></td>
<td>Six-Sigma: DMAIC – IMPROVE Phase (Solutions Selection Approaches)</td>
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<td>November 16</td>
<td>Six-Sigma: DMAIC – CONTROL Phase</td>
<td>Evans &amp; Lindsay: Chapter 6 George et al. Chapter 8</td>
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<tr>
<td>November 18, 23, 30, December 2</td>
<td>ProcessModel Project Work Sessions</td>
<td>ProcessModel Software</td>
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<tr>
<td>December 11</td>
<td>FINAL EXAM</td>
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**Note:** Please bring the books to the classes as indicated. Class schedule may change according to the pace of the class, opportunities for guest lectures by visiting industry professionals, and needs for the MGSC 897 class in which these topics/tools are implemented.