OPERATION MANAGEMENT

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Learning objectives: The objective of this course is to provide students with necessary concepts and technologies such as:

- Production of services.
- Productivity.
- Total quality.
- Competitiveness.
- Restructuration.
- Production and operation globalization.
- MRP.
- Lean Manufacturing.
- Forecasting.

The aim is that students achieve deep knowledge on production of industrial production and services, but secondly and not less important, to adequate all concepts and tools throughout the whole organization to the search of a horizon of excellence, constant improvement, high competitiveness, and quality.

Contents:

Cost

Quality

Time

Flexibility

Order winners and qualifiers

Development of new services or products

Development strategies

Definition of services and products

Development process

Operations strategy as decision pattern

***CHAPTER 3* PROJECT MANAGEMENT**

Project management in the organization

Use of projects to implement an operation strategy

Interaction of different functions

Project definition and organization

Definition of the scope and the objectives of a project

Selection of a project manager and team

Organization structure

Project planning

Definition of labor division structure

Preparation of a network diagram

Program development

Discussion about giving up cost for time or vice versa

Risk assessment

Critical chain

Resource-related problems

Critical chain method

Project monitoring and control

Project status monitoring

Project resource monitoring

Project control

PART 2 – PROCESS MANAGEMENT

CHAPTER 4 **PROCESS STRATEGY**

Process strategies in the organization

Process strategies

Main process decisions

Service process structure

Nature of service processes: Customer contact

Customer contact matrix

Service process structuring

Incorporation of the strategy in service processes

Manufacture process structure

Product and process matrix

Manufacture process structuring

Production and inventory strategies

Incorporation of the strategy in manufacture processes

Customer participation

Possible disadvantages

Possible advantages

Flexibility of resources

Labor force

Equipment

Capital intensity

Automation of manufacture processes

Automation of service processes

Scope economies

Strategic adjustment

Decision patterns for service processes

Decision patterns for manufacture processes

Acquiring and approach

Strategies of change

Process reengineering

Process improvement

CHAPTER 5 PROCESS ANALYSIS

Process analysis in the organization

Systematic method

- Identification of opportunities
- Definition of scope
- Process documentation
- Performance evaluation
- Process redesign
- Implementation of changes

Process documentation

- Flow charts
- Service plans
- Process charts

Performance evaluation

- Data analysis tools
- Data selection
- Simulation

Process redesign

- Generation of ideas through questions and brainstorming sessions
- Benchmarking

Process management

CHAPTER 6 PROCESS PERFORMANCE AND QUALITY

Performance and quality of organization processes

Costs of deficient performance and poor quality performance

- Prevention costs
- Valuation costs
- Internal costs of a failure
- External costs of a failure

Total quality management

- Customer satisfaction
- Employee participation
- Continuous improvement

Statistical process control

- Product variation

Control charts

Methods of statistical process control

Control charts for variables

Control charts for attributes

Process capacity

Definition of process capacity

Use of continuous improvement to determine process capacity

Quality engineering

Six Sigma

Six Sigma improvement model

Implementation

International quality documentation rules

ISO 9000 documentation rules

ISO 14000: An environmental management system

Advantages of ISO certification

National Malcom Baldrige Quality Award

***CHAPTER 7* MANAGEMENT OF CONTRAINTS**

Management of organization constraints

Theory of constraints

TOC measurement of capacity, utilization and performance

Fundamental principles of TOC

Identification and management of bottlenecks

Use of bottlenecks in mixed product decisions

Capacity planning for long time horizons

Economies of scale

Diseconomies of scale

Strategies to determine capacity opportunity and size

Determination of capacity cushion size

Expansion opportunity and magnitude

Relationship between process capacity and other decisions

Systematic method for long term decisions about capacity

Estimation of capacity needs

Identification of capacity gaps

Generation of alternatives

Evaluation of alternatives

Capacity planning tools

Queue models

Simulation

Decision trees

***CHAPTER* 8 PROCESS DISTRIBUTION**

Management of process distribution in the organization

Distribution planning

Strategic aspects

Types of distribution

Performance criteria

Creation of hybrid distributions

One worker, multiple machines

Group technology

Flexible flow distribution design

Gathering information

Creation of a block plan

Application of the weighted distance method

Design of a detailed distribution

Other decision making auxiliary tools

Storehouse distribution

Office distribution

Line flow distribution designs

Line balancing

Other considerations

***CHAPTER* 9 LEAN SYSTEMS**

Lean production systems

Characteristics of lean service and manufacturing production systems

Labor flow pull method

Origin quality

Small-sized lots

Uniform working loads

Standardized working components and methods

Close relationship with suppliers

Flexible workforce

Line streams

Automation

Five S

Preventive maintenance

Continuous improvement with lean systems

The Kanban system

General operation rules

Determination of container numbers

Other signals in the Kanban system

Value stream maps

JIT II

Operation advantages and implementation issues

Organizational considerations

Process considerations

Inventory and programming

PART 3 – VALUE CHAIN MANAGEMENT

***CHAPTER 10* SUPPLY CHAIN STRATEGIES**

Supply chain strategy in the organization

Supply chain for services and manufacture

Services

Manufacture

Supply chain performance measures

Inventory measures

Process measures

Relationship with financial measures

Supply chain dynamics

External causes

Internal causes

Integrated supply chains

The customer relationship process

Electronic commerce and the marketing process

Electronic commerce and the order placement process

The order supply process

Inventory placement

Inventories managed by suppliers

Continuous replenishment program

Identification by radiofrequency

Distribution processes

The relationship with supplier process

Supplier selection and certification

Relationship with the supplier

Electronic purchases

Centralized purchases vs. localized purchases

Value analysis

Supply chain strategies

Strategic approach

Massive personalization

Lean supply chains

Outsourcing and off-shoring

Virtual supply chains

CHAPTER 11 **LOCATION**

Decisions on organization location

Factors affecting location decisions

Dominant manufacture factors

Dominant service factors

Geographic information systems and location decisions

Use of GIS to identify customer locations and demographic segments

Choice between in situ expansion, new location, or relocation

Location in only one facility

Comparison between several sites

Application of the load-distance method

Use of equilibrium point analysis

Location of a facility within a facility network

GIS method to locate multiple facilities

Transportation method

Other location analysis methods

CHAPTER 12 **INVENTORY MANAGENET**

Inventory management in the organization

Basic inventory concepts

Pressure to maintain low inventories

Pressure to maintain high inventories

Types of inventory

Tactics to reduce inventories

Placement of inventories

Identification of critical inventory elements by ABC analysis

Economic order quantity

Calculation of EOQ

Explanation of change effect

EOQ and lean systems

Inventory control systems

Continuous revision system

Periodical revision systems

Comparative advantages of Q and P systems

Hybrid systems

Precision of inventory records

CHAPTER 13 **PROGNOSIS**

Organization prognosis

Demand patterns

Prognosis system design

Decision on what is foretold

Selection of type of prognosis technique

Prognosis by computers

Judgment methods

Sales personnel estimates

Executive opinion

Market research

Delphi method

Guidelines to use judgment prognosis

Causal methods: Linear regression

Time series methods

Empirical prognosis

Average estimate

Inclusion of a tendency

Season patterns

Selection of a time series method

Prognosis error

Time series methods selection criteria

Use of multiple techniques

Combined prognosis

Focused prognosis

Recapitulation: Prognosis as a process

A typical prognosis process

Prognosis as a nested process

***CHAPTER 14* SALES AND OPERATIONS PLANNING**

Organization sales and operations planning

The purpose of sales and operations plans

Aggregation

Relationship between a sales and operations plan and other plans

The decision context

Information input

Typical objectives

Reactive alternatives

Dynamic alternatives

Planning strategies

Pertinent constraints and costs

Sales and operations planning as a process

Decision making support tools

Spreadsheets

Transport method

Management consideration

CHAPTER 15 **RESOURCE PLANNING**

Organization resource planning

Company resource planning

What an ERP system does

How to design ERP systems

Planning and control systems for manufacturers

Dependant demand

Possible planning and control systems

Material request planning

List of materials

Master production program

Inventory record

Planning factors

Results of a material request planning

MRP and the environment

Drum-buffer-rope system

Planning of resources for service suppliers

Dependant service demand

List of resources

CHAPTER 16 **PROGRAMMING**

Organization programming

Programming of service and manufacturing processes

Programming of customer demand

Programming of employees

Operation programming

Working modality: The course develops as from the following working/learning modalities:

1. Theory classes: Students must read the *Basic References* before the week stated in the schedule. Lectures by the Professor are clarifying as regards the *Basic References*, and

explanatory as regards the *Consultation References* and other recently appearing material.

2. Practical cases: Current practical cases will be developed based on the *Consultation References* or recent international or national magazines on the subject.

3. Permanent assessment: The updated status of the subject by the student shall be evaluated through short written or oral tests.

4. Special works: Students will be asked to produce special works on specific topics, developed in groups or individually.

5. Showing of videos: Some subject topics will be detailed through the use of updated videos.

6. Reception of guests at the University or assistance at Production Organizations: They shall be organized during the semester, in order to be in contact with a real structure.

Attendance: To pass the course, students cannot have more than:

- Teaching classes: **3 (three) absences**.
- Tutorial clases: 3 **(three) absences**.

Students are responsible for signing the attendance record before or after the class, as stated by the professor.

Inquiry time:

• Before or after tutorial classes (after e-mail notice/confirmation)

• If students cannot come at such times, another day and time may be agreed with the professor.

Course and reading schedule:

Week #	**Program chapter**	**Obligatory reading**
1	1 *Operations as competitive weapons*	KRM, Chap. 1
2	1 *Operations as competitive weapons* 2 *Operation strategy*	KRM, Chap. 1 KRM, Chap. 2

3	2 *Operation strategy* 3 *Project management*	KRM, Chap. 2 KRM, Chap. 3
4	3 *Project management* 4 *Process strategy*	KRM, Chap. 3 KRM, Chap. 4
5	4 *Process strategy* 5 *Process analysis*	KRM, Chap. 4 KRM, Chap. 5
6	6 *Performance and process quality*	KRM, Chap. 6
7	7 *Management of constraints*	KRM, Chap. 7
8	**Review and partial test weeks**	
9		
10	8 *Process distribution* 10 *Supply chain strategy*	KRM, Chap. 8 KRM, Chap. 10 + KRM(9E), Chap. 10
11	11 *Location*	KRM, Chap. 11
12	12 *Inventory management*	KRM, Chap. 12
13	9 *Lean systems*	KRM, Chap. 9
14	13 *Prognosis* 14 *Sales and operations planning*	KRM, Chap. 13 KRM, Chap. 14
15	15 *Planning of resources* 16 *Programming*	KRM, Chap. 15 KRM, Chap. 16
16	**Presentation of works** **Closing of the subject**	
17	**Review and final test weeks**	
18		
19		

References and teaching material:

BASIC

1. Krajewski, Lee; Ritzman, Larry and Malhotra, Manoj. 2008. Administración de operaciones (8E). Mexico: Pearson Educación (KRM) (*Main text of the course*).

2. Schroeder, Roger. 2007. *Operations management: Contemporary concepts and cases*. New York: McGraw-Hill/Irwin.

3. Heizer, Jay. 2005. *Operations management*. New York: Prentice Hall.

SPECIFIC

4. Biasca, Rodolfo. 1984. *Productividad: un enfoque integral del tema*. Buenos Aires: Macchi.
5. Biasca, Rodolfo. 1997. *Resizing: reestructurando, replanteando y recreando la empresa para lograr competitividad*. Buenos Aires: Macchi.
6. Demming, W. Edward. 2000. *Out of the crisis*. Boston: The MIT Press.
7. Diaz, Martín Ángel. 2007. *El arte de dirigir proyectos*. Buenos Aires: Alfaomega.
8. Evans, James and Lindsay, William. 2007. *Managing for quality and performance excellence*. New York: South-Western College.
9. Fung, Victor; Fung, William y Wind, Jerry. 2007. *Competing in a flat world: building enterprises for a borderless world*. Philadelphia: Wharton School Publishing.
10. Hay, Edward J. 1989. *Justo a tiempo*. Buenos Aires: Norma.
11. Heskett, J.; Sasser Jr., Earl and Hart, Christopher. 2007. *Service breakthroughs*. New York: Free Press.
12. Kanawaty, George. 1996. Introducción al estudio del trabajo. Ginebra: OIT.
13. Morgan, James and Liker, Jeffrey. 2006. *The Toyota product development system: integrating people, process and technology*. New York: Productivity Press.
14. Naisbitt, John. 1988. *Megatrends: ten new directions transforming our lives*. New York: Grand Central Publishing.
15. Naisbitt, John. 1991. *Megatrends 2000*. New York: Avon.

VIDEOS (shown in class)

A. Competitive weapon (Starwood Hotel)*
B. Project management (Starwood Hotel)*
C. Process choice*
D. Process analysis (Starwood Hotel)*
E. Process performance and quality (Starwood Hotel)*
F. Total quality management*
G. Waiting lines*
H. Lean systems*
I. Supply chain (Starwood Hotel)*

J. Information technology*

K. Inventory and textbooks*

L. Sales and operations planning (Starwood Hotel)*

M. ERP (Nantucket Nectars)*

N. Service scheduling*

O. Assembly lines

P. FedEx

Q. Quality cycles in Japan

R. Competing through quality

S. The Demming report

T. HP, company competitiveness

U. The 5 evils of management

*Videos refer to **Operation management** (Krajewski, 2008).

Assessment mechanism:

During the semester, the assessment produced by continuous work between the student and the professor will result in the following marks, with the following weight scheme:

Component	Modality	%
Partial test	Individual	30
Final test	Individual	40
Final project	Group	30
Activity and participation	Individual	
	Total	100

Partial test

During the partial tests week established by the University, students shall take a partial, individual test on the contents seen during the first half of the semester. The test methodology and details shall be given during the teaching and tutorial classes.

Final test

During the final tests week established by the University, students shall take a partial, integrating, and individual test on the contents seen during the semester. The test methodology and details shall be given during the teaching and tutorial classes.

Group work

Students shall prepare and present a group analytical work on a company/enterprise in reference to the theoretical contents taught by the professor.

The work is intended to analyze practices in the selected company, in view of the theoretical contents seen in the subject.

The work also seeks to promote contact of the student with company world.

Work details and presentation dates shall be discussed during the teaching and tutorial classes.

Class activity and participation

Student participation, discussion and contributions in class (teaching and tutorial classes), prior reading, and the result of special activities developed in class (individual and/or in group) shall be considered.

Promotion regime

- The student must pass the final test with a mark equal or above 4 (four) points to pass the subject.
- The weighted system becomes ineffective if any of the assessment components is below 4 (four) points; if required, a make-up test shall be taken.
- The mark for *"Class activity and participation*" shall not be weighted if the student obtains a mark of 5 (five) or below in the final test.

Plagiarism and intellectual dishonesty

Universidad de San Andrés requires strict adherence to the rules of intellectual honesty. The existence of plagiarism implies great dishonor, inappropriate in university life. Plagiarism is not only produced by the existence of literal copy during the tests but also whenever an abusive advantage of foreign intellectual effort is acknowledged. The Ethics Code of the University considers appropriation of foreign intellectual work as punishable behavior that discredits the novelty and originality contents that should be expected in

the requested works; therefore, quotations and references shall be in accordance with the accepted academic formats (MLA, APA, Chicago, etc.). Presumptive violation of these rules shall lead to the formation of an Ethics Board that shall recommend disciplinary sanctions that may include written warning, suspension, or expulsion, in accordance with the severity of the fault.