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Action-Date: UWUCC App = 3/19/02
Senate App 4/2/02

CURRICULUM PROPOSAL COVER SHEET
University-Wide Undergraduate Curriculum Committee

I. CONTACT

Contact Person I. Wisnieski Phone 7-5912

Department _____

II. PROPOSAL TYPE (Check All Appropriate Lines)

__X__ COURSE _____
Suggested 20 characters

____ New Course* _____
Course Number and Full Title

__X__ Course Revision MGMT 330
Course Number and Full Title

____ Liberal Studies Approval + MGMT 330
for new or existing course
Course Number and Full Title

____ Course Deletion _____
Course Number and Full Title

____ Number and/or Title Change _____
Old Number and/or Full Old Title

_____
New Number and/or Full New Title

____ Course or Catalog Description Change _____
Course Number and Full Title

_____ PROGRAM: _____ Major _____ Minor _____ Track

____ New Program* _____
Program Name

____ Program Revision* _____
Program Name

____ Program Deletion* _____
Program Name

____ Title Change _____
Old Program Name

_____
New Program Name

III. Approvals (signatures and date)

I. Wisnieski 9/30
Department Curriculum Committee

Charlotte B. Nee 10/3/01
Department Chair

I. Wisnieski 9/30
College Curriculum Committee

[signature] 10/3/01
College Dean

+Director of Liberal Studies (where applicable)

*Provost (where applicable)

Course Syllabus

I. CATALOG DESCRIPTION:

MGMT 330 Production and Operations Management

3 Lecture hours
0 Lab hours
3 Credits
(3c-01-3sh)

Prerequisites: MATH 115, MATH 214, and Junior status, Eberly College of Business and Information Technology or approved major

Study of the process of converting an organization's inputs into outputs whether in goods-producing or service industries. Provides an overview of concepts, tools, and techniques used in management of production and operations function in organizations.

II. COURSE OBJECTIVE

Students will learn what every manager should know about the management of production and operations in organizations. More specifically, after taking this course successfully, the student will be able to:

(1) Exhibit working knowledge of the theories and practices pertaining to management of operations needed to create goods/services efficiently and effectively.
(2) Realize the importance of the interrelation between the production/operations management (POM) function and other functional areas including Marketing, MIS, Accounting, Design, etc.
(3) Effectively address several strategic, design, and day-to-day issues involved in making a product or delivering a service.
(4) Apply quantitative models of Operations Management to work situations.

III. COURSE OUTLINE

A. Introduction (2 hours)

Overview of POM techniques and applications in manufacturing and services; systems approach to OM; Interactions and integration of OM with other functional areas; Strategic importance of OM.

B. Quality Management (3 hours)

What is quality? Customer vs. producer orientation; Cost of poor quality; Quality as competitive advantage; Preventing quality problems; How to achieve excellence in quality-- Deming, Juran, etc; How the Japanese do it? Quality circles; Total quality control.

C. Product Design and Process Selection (3 hours)

Manufacturing and Service sectors; Team approach to product design; Quality and product liability considerations; Product design & development sequence; Process selection and process flow analysis; Operational classification of services; Trade off presented by service-system design matrix.

D. Managing Technology (2 hours)

Manufacturing technologies-- Automation, Flexible manufacturing; Service sector technologies-- Electronic fund transfer, On-line data bases, Electronic mail, Integrated communication and information systems, Bar codes; Computer Aided Design and Manufacturing; Managing Technological Change.

E. Capacity and Forecasting (3 hours)

Definition of capacity; Estimating capacity for manufacturing and services; Systems approach to capacity determination; Dependence of capacity planning on accurate forecasting; Qualitative and quantitative forecasting techniques; Capacity decisions--when, where, and how much.

F. Supply Chain Management and Facility Location (3 hours)

Technical and Strategic issues in Supply Chain Management; Current trends in location; Qualitative and quantitative factors in location decisions; Quantitative techniques for location decision including heuristic approaches for service location decisions.

G. Facility Layout (3 hours)

Facility layout considerations such as machine interference, bottlenecks, safety, flexibility, etc.; Types of layout including process layout, product layout, fixed layout, cellular manufacturing layout, and hybrid layout; Assembly line design and balancing; Material handling systems.

H. Waiting Line Models (2 hours)

Discussion of various simple waiting line models and their applications in the areas such as capacity and resource planning, facility layout, service facility design.

I. Job Design and Work Measurement (2 hours)

Human-machine interaction and its effects on product and process design; Job design strategies; Ergonomics and human factors considerations; Work measurement and time studies; Predetermined time standards (PMTS); Work sampling; How the Japanese do it? Emphasis on group vs. emphasis on individual.

J. Project Management (3 hours)

Application of network models to project management; Critical Path Method; Program Evaluation and Review Technique; Time estimates and practical problems; Computer solutions to network problems.

K. Aggregate Planning (2 hours)

Overview of medium-range aggregate planning; Parameters for the planning process; Planning strategies; Criteria for selecting aggregate plans; Mathematical models for aggregate plans--linear programming, linear decision rule (LDR), etc.

L. Inventory Management (3 hours)

Concept of lot-sizing; Cost of ordering and holding inventory, and cost of shortage; Basic economic order

quantity (EOQ) model and its variations; Probabilistic inventory models; Safety stock determination; Periodic review systems.

M. Material Requirement Planning (MRP) (3 hours)

Purpose and philosophy of MRP; Components of MRP including bill of material (BOM), master production schedule (MPS), inventory status file; Computerized MRP.

N. JIT System (3 hours)

What is JIT? "Kanban"; Comparison of JIT (Pull System) with MRP (Push System); Enforced problem solving; JIT as manufacturing philosophy.

O. Emerging Issues in Operations (2 hours)

Current and emerging issues in operations management.

(The remaining 3 hours are for exams and review)

IV. EVALUATION METHODS

Exams (3)	25% each
Homework/quizzes (8-12 spread throughout)	20%
Class Participation/Group Activities	5%

The final grades will be based on the following distribution:
90% and above—A; 80% - 89.9%—B; 70% - 79.9%—C; 60% - 69.9%—D; >60%—F.

Exams will be cumulative. A comprehensive makeup examination (students find it to be very hard) will be scheduled toward the end of the semester; it can replace a maximum of one **missed** exam. Don't miss exams for trivial reasons. If you must miss because of emergencies, I may provide a make up opportunity at a mutually convenient time within 10 days of the original exam. However, those emergencies must be substantiated (examples of acceptable proof: Obituary Notice from a newspaper; record of doctor visit; etc.)

Exams will comprise of two parts: Part 1 will include a set of objective questions (emphasis on conceptual understanding rather than fact memorization); and Part 2 will include one or more of the following type of questions--numerical problems, short written answers, mini-cases, etc.

V. REQUIRED TEXTBOOKS SUPPLEMENTAL BOOKS AND READINGS

Textbook: Davis, M. M, Aquilano, N.J., and Chase, Richard, Fundamental of Operations Management, 3rd Edition, Irwin McGraw-Hill. 1999.
Readings: Other readings may be assigned.

VI. SPECIAL RESOURCE REQUIREMENTS

Computer hardware and software needed for analysis will be provided through the PC lab.

VII. BIBLIOGRAPHY (Brief)

W.C. Benton, and S. Hojung "Shin Manufacturing planning and control: the evolution of MRP and JIT integration" European Journal of Operational Research, Nov 1, 1998 v110 (3), p411-440.

Blackburn, J., ed., Time-Based Competition: The Next Battleground in American Manufacturing, Irwin, 1991.

Chew, W.B., Leonard-Barton, D. and R.E. Bohn. "Beating Murphy's Law." Sloan Management Review, July 1991.

Cole-Gomolski, Barb. "ERP! Excuse us as we digest our new system: Ripple effect can hurt customer service."
Computerworld, Sept 21, 1998, v32(38), p1.

Deming, W. Edward. Out of the Crisis. Cambridge, MA: M.I.T. Center for Advanced Engineering Study, 1986.

Davidow, W.H. and B. Uttal. "Service Companies: Focus or Falter," Harvard Business Review, July-Aug, 1989.

Dube, Laurette, Johnson, Michael D., and Renaghan, Leo Mark. "The QFD Approach to Extended Service Transactions," Production and Operations Management, Fall 1999 v8(3), p 301.

Fuller, F.T. "Eliminating Complexity from Work: Improving Productivity by Enhancing Quality," National Productivity Review, Autumn, 1985.

Goldratt, Eliyahu M., and Jeff Cox. The Goal: A Process of Ongoing Improvement. (2nd edition. Croton-on-Hudson, NY: North River Press, 1993.

Hayes, R.H. and G.P. Pisano. "Beyond World-Class: The Manufacturing Strategy," Harvard Business Review, January-February, 1994.

Landry, S., Duguay, Claude R., Chausse, S. and Jean-Luc Themens. "Integrating MRP, kanban and bar-coding systems to achieve JIT procurement." Production & Inventory Management Journal, Winter 1997, v38 (1), p8-12.

Lembrecht, M.R., and L. Decaluwe. "JIT and Constraint Theory; The issue of Bottleneck Management," Production and Inventory Management Journal, 3rd Quarter, 1988.

Shin, D, and H. Min, "Flexible Line Balancing Practices in Just-in-time environment," Production and Inventory Management Journal, 2nd Quarter, 1991.

Spedding, P. E. "Revisiting time-phased order points in the health care industry." IIE Solutions, Feb 1998, v30(2), p22-24.

Zinn, W. "Should You Assemble Products Before an Order is Received?" Business Horizons, March-April, 1990.

Part II.

2. Summary of the proposed revisions

The department is changing the prerequisite from:

MATH 121, 214, junior status, Eberly College of Business and Information Technology or approved major

To:

MATH 115, 214, junior status, Eberly College of Business and Information Technology or approved major

There was also an objective change to better reflect course content as suggested by alumni and other stakeholders.

There has also been a minor change in the course outline to reflect new research in the area and again suggestions made by stakeholders.

3. Justification for the revision.

It is quite easy to explain MATH 115 for MATH 121. This course was jointly developed between college of Business representatives and Mathematics dept representatives to develop a course that would best fit the needs of ECOBIT students. MATH 115 is that course and students will be advised to take MATH 115 unless they have a strong reason to take the more general calculus course.

The changes in the objectives and course outline reflect an updating of curriculum to reflect changes in this subject matter and suggestions made by stakeholders.

Part II. 4. Old Syllabus of Record

Course Syllabus

I. CATALOG DESCRIPTION

MG 330 Production and Operations Management

3 credits
3 lecture hours
0 lab hours
(3c-01-3sh)

Prerequisites: MA 214, MA 121, Jr. Standing, College of Business or approved major.
Corequisites: none

Study of the process of converting an organization's inputs into outputs whether in goods producing or service Industries. Provides an overview of concepts, tools, and techniques used in management of production and operations function in organizations.

II. COURSE OBJECTIVES

Students will learn what every manager should know about the management of production and operations in organizations.
More specifically, the course objectives are:

1. Students will learn about the concept and management of quality as competitive advantage. Use of quality circles, and Deming's and Juran's theories of quality management.
2. Students will study the approaches to product design, capacity planning and selection of appropriate technology.
3. Students will learn techniques of facility planning, selecting facility location and layout, and application of network analysis to project management.
4. Students will learn theories and methods of job design work measurement, and aggregate planning.
5. Students will learn the models and techniques of inventory management, material requirement planning, including JIT and "Kanban" methods.

III. COURSE OUTLINE

IV. DESCRIPTION OF CURRICULUM CHANGE

I. Catalog Description

MG 330 Production and Operations Management

3 credits
3 lecture hours
0 lab hours
(3c-01-3sh)

Prerequisites: MA 214, MA 121, Jr. Standing, College of Business or approved major.

Corequisties: none

Study of the process of converting an organization's inputs into outputs whether in goods producing or service industries. Provides an overview of concepts, tools, and techniques used in management of production and operations function in organizations.

A. Introduction (2 lectures)

Overview of POM techniques and applications in manufacturing and services; systems approach to OM; Interactions and integration of OM with other functional areas; Strategic importance of OM.

B. Quality Management (4 lectures)

What is quality? Customer vs. producer orientation; Cost of poor quality; Quality as competitive advantage; Preventing quality problems; How to achieve excellence in quality-- Deming, Juran, etc; How the Japanese do it? Quality circles; Total quality control.

C. Product Design and Process Selection (3 lectures)

Manufacturing and Service sectors; Team approach to product design; Quality and product liability considerations; Product design & development sequence; Process selection and process flow analysis; Operational classification of services; Trade off presented by service-system design matrix.

D. Managing Technology (4 lectures)

Manufacturing technologies-- Automation, Flexible manufacturing; Service sector technologies-- Electronic fund transfer, On-line data bases, Electronic mail, Integrated communication and information systems, Bar codes; Computer Aided Design and Manufacturing; Managing Technological Change.

E. Capacity and Forecasting (2 lectures)

Definition of capacity; Estimating capacity for manufacturing and services; Systems approach to capacity determination; Dependence of capacity planning on accurate forecasting; Qualitative and quantitative forecasting techniques; Capacity decisions--when, where, and how much.

F. Facility Location (3 lectures)

Current trends in location; Qualitative and quantitative factors in location decisions; Quantitative techniques for location decision including heuristic approaches for service location decisions.

G. Facility Layout (3 lectures)

Facility layout considerations such as machine interference, bottlenecks, safety, flexibility, etc.; Types of layout including process layout, product layout, fixed layout, cellular manufacturing layout, and hybrid layout; Assembly line design and balancing; Material handling systems.

H. Waiting Line Models (2 lectures)

Discussion of various simple waiting line models and their applications in the areas such as capacity and resource planning, facility layout, service facility design.

I. Job Design and Work Measurement (3 lectures)

Human-machine interaction and its effects on product and process design; Job design strategies; Ergonomics and human factors considerations; Work measurement and time studies; Predetermined time standards (PMTS); Work sampling; How the Japanese do it? Emphasis on group vs. emphasis on individual.

J. Project Management (4 lectures)

Application of network models to project management; Critical Path Method; Program Evaluation and Review Technique; Time estimates and practical problems; Computer solutions to network problems.

K. Aggregate Planning (2 lectures)

Overview of medium-range aggregate planning; Parameters for the planning process; Planning strategies; Criteria for selecting aggregate plans; Mathematical models for aggregate plans--linear programming, linear decision rule (LDR), etc.

L. Inventory Management (3 lectures)

Concept of lot-sizing; Cost of ordering and holding inventory, and cost of shortage; Basic economic order quantity (EOQ) model and its variations; Probabilistic inventory models; Safety stock determination; Periodic review systems.

M. Material Requirement Planning (MRP) (4 lectures)

Purpose and philosophy of MRP; Components of MRP including bill of material (BOM), master production schedule (MPS), inventory status file; Computerized MRP.

N. JIT System (3 lectures)

What is JIT? "Kanban"; Comparison of JIT (Pull System) with MRP (Push System); Enforced problem solving; JIT as manufacturing philosophy.

IV. EVALUATION METHODS

The final grade for the course will be determined as follows:

60% Tests. Three tests (including final) consisting of multiple choice, true-false, completion, short answers, and/or essay.

25% Problem assignments, written case analyses and in-class discussions, quizzes, and/or exercises.

15% Research Paper and/or Project: Each student will complete a written rport on a topic approved by the instructor. The report will be graded both on content and mechanic. The student, with the approval of the instructor, may opt for a project designing a part of the production or operations system for an organization. All completed work will be due by the day of the last class.

V. REQUIRED TEXTBOOKS SUPPLEMENTAL BOOKS AND READINGS

Textbook: Karajewski, L. J. and L. P. Ritzman, Operations management: Strategy and Analysis, (2nd edition), Readings, Mass.: Addison-Wesley Publishing Company, 1990.

Readings: Handouts will be provided. Other readings may be assigned.

VI. SPECIAL RESOURCE REQUIREMENTS

Computer hardware and software needed for analysis will be provided through the PC lab.

VII. BIBLIOGRAPHY

"America's Best Managed Factories," Fortune, May 28, 1984

Amstead, B.J., P.E. Oswald, and M.L. Bergman, Manufacturing Processes, (7th edition).

Buffa, E.S., and J.G. Miller, Production-Inventory Systems: Planning and Control, (3rd edition).

Collier, D.A., Service Management: The Automation of Services.

Hays, R.H., and S.C. Wheelwright, Restoring Our Competitive Edge: Competing Through Manufacturing.

Juran, J.M., and F.M. Gryna, Quality Planning and Analysis.

Makridakis, S., S.C. Wheelwright, and V.E. McGee, Forecasting: Methods and Applications.

Martin, C.C., Project Management: How to Make It Work.

Nadler, Gerald, Work Design.

Porter, M.E., Competitive Advantage: Creating and Sustaining Superior Performance.

Schmenner, R.W., Making Business Location Decisions.

Schonberger, R.J., Japanese Manufacturing Techniques.

Vollman, T.E., W.L. Berry, and D.C. Whybark, Manufacturing Planning and Control Systems.

Weist, J.D., and F.K. Levy, A Management Guide to PERT/CPM.

September 28, 2001

To whom it may concern:

At the request of the faculty of the College of Business, the Mathematics Department developed the course MATH 115 Applied Mathematics for Business. This course was offered under the Special Topics number MATH 281 during the 2000-2001 academic year, and was approved by the IUP Senate, and subsequently the Council of Trustees, in the spring of 2001.

The understanding reached between the Mathematics Department and the College of Business was that students in programs requiring MATH 121 would be required to take MATH 115 instead. This change requires no additional resources for the Mathematics Department. During the semesters MATH 115 was offered under the special topics number, we decreased the number of sections of MATH 121 that we put on the schedule by the number of sections of MATH 281 that we added to the schedule to accommodate the College of Business students. Based on this experience, we are confident we can staff both MATH 121 and MATH 115 without additional faculty complement.

The faculty of the Mathematics Department supports proposals from departments in the College of Business aimed at formalizing the curriculum change from MATH 121 to MATH 115. Please contact me if you have any questions.

Sincerely,

Gerald Buriok, Chairman
Mathematics Department