UNIVERSITY OF MARY WASHINGTON -- NEW COURSE PROPOSAL
Electronically submit this completed form with PDF attachments to the Chair of the College Curriculum Committee.

**COLLEGE (check one):**
- Arts and Sciences
- Business
- Education

Proposal Submitted By: Chris Garcia
Date Prepared: 10/1/2012

Course Title: Quantitative Modeling and Supply Chain Management

Department/discipline and course number*: COB/MBUS 549

*This course number must be approved by the Office of the Registrar before the proposal is submitted.

Number of credits proposed: 3
Prerequisites: LRSP 316 or MATH 200 or equivalent

Will this be a new, repeatable “special topics” course? (Do you want students to be able to take this new course more than once if the topic changes?)

NO X YES

Date of first offering of this new course: FALL SEMESTER, year 2013

Proposed frequency of offering of the course: Once or Twice per Year

List the faculty who will likely teach the course: Chris Garcia, Xiaofeng Zhao, Galen deGraff, adjunct faculty

Are ANY new resources required? NO X YES Document in attached impact statement

This new course will be (check all that apply):
- Required in the major X
- General Elective
- Elective in the major
- General Education**

**AFTER the new course is approved, a separate proposal must be sent to the General Education Committee.

Catalog Description:
MBUS 549: Quantitative Modeling and Supply Chain Management (3)
Prerequisite: LRSP 316 or MATH 200 or equivalent

This course is intended to introduce students to core supply chain concepts while simultaneously developing skills in quantitative modeling and analysis. Heavy emphasis is placed on applying modeling approaches from operations research to complex problems found in supply chain management. Topics include linear and integer programming, network models and supply chain network design, scheduling and aggregate planning models, inventory models, and demand forecasting models. Students will also gain experience using optimization software including Excel Solver and ILOG Optimization Studio.

COURSE HISTORY
Was this course taught previously as a topics or experimental course? YES NO X

Course Number and Title of Previous Course

Semester Offered Enrollment

CHECK HERE if the proposed course is to be equated with the earlier topics or experimental offerings. This means that students who took the earlier “topics” course will only be able to take the new course if they made a C- grade or lower in the earlier course.

NOTE: If the proposed course has not been previously offered as a topics or experimental course, explain in the attached rationale statement why the course should be adopted even though it has not been tried out.

REQUIRED ATTACHMENTS:
1. Rationale Statement (Why is this course needed? What purposes will it serve?)
2. Impact Statement (Provide details about the Library, space, budget, and technology impacts created by adding this new course. Include supporting statements from the Library, IT Department, etc. as needed.)
3. Sample Syllabus
Supply chain management has become mission-critical to virtually every modern enterprise, and the quality of supply chain management and design can determine business success or failure. At the same time, quantitative modeling and analysis skills are more important than ever as technological advances have enabled sophisticated data and evidence-based approaches to become routine aspects of managerial decision making. Supply chain management is a heavily quantitative discipline and provides fertile ground for developing advanced modeling and analysis skills through interesting and complex problems that are not only realistic in nature, but also critical to business success. As a proposed core course for the updated MBA curriculum, this course aims to develop fluency in building complex quantitative models while doing so expressly within a supply chain management context. The course will be structured around the core supply chain functions and as a result, will provide a realistic context and motivation for learning the advanced quantitative methods.

Impact Statement

The new course should have minimal impact on library space, budget, and IT support. The course will involve the use of Microsoft Excel and ILOG Optimization Studio. Microsoft Excel is highly pervasive and may also be substituted with Open Office, which is open-source and free of charge. Similarly, ILOG Optimization Studio is freely available from IBM for academic purposes. Beyond these software requirements, no further impact is anticipated.
MBUS 549: Quantitative Modeling and Supply Chain Management
Fall 2013

Instructor: Christopher J. Garcia, Ph.D.
Office: George Washington Hall 215B
Telephone: (540) 654-1456
Email: cgarcia@umw.edu
Office hours: TR 3:00 pm-4:30 p.m., F 3:00-5:00 p.m. and by appointment
Prerequisite: BPST 316 or similar statistics course, high degree of fluency with basic algebra
NOTE: This course will require extensive effort to succeed

Course Description:
Supply chain management has become mission-critical to virtually every modern enterprise, and the quality of supply chain management and design can determine business success or failure. At the same time, quantitative modeling and analysis skills are more important than ever as technological advances have enabled sophisticated data and evidence-based approaches to become routine aspects of managerial decision making. This course is intended to introduce students to core supply chain concepts while simultaneously developing skills in quantitative modeling and analysis. Heavy emphasis is placed on applying modeling approaches from operations research to complex problems found in supply chain management. Topics include linear and integer programming, network models and supply chain network design, scheduling and aggregate planning models, inventory models, and demand forecasting models. Students will also gain experience using optimization software including Excel Solver and ILOG Optimization Studio.

Learning Outcomes:
1) Students are able to formulate linear and integer programming models for non-trivial planning, scheduling, and resource-allocation problems.
2) Students are able to use a modern software package to obtain solutions to optimization problems.
3) Students are able design basic supply chain networks using optimization approaches.
4) Students are able to perform basic demand forecasting using time-series analysis.
5) Students are able to perform aggregate planning using optimization approaches.
6) Students are able to solve inventory management problems using EOQ-based approaches.

Required Software:
Microsoft Word and Excel

Textbook

Grading and Assigned Work:
Exam 1 (30%), Exam 2 (20%), Case Study 1 (25%), Case Study 2 (25%)

Various homework assignments will be given to provide the opportunity to solve problems and enable students to assess their mastery of course material. Homework will be ungraded; however, it is essential that students complete assigned homework to gain the necessary problem-solving skills. There is a strong correlation between homework completion and exam performance.

For final grades a total grade of 93.34 and above receives an “A”, 90.00 to 93.33 is an “A-“, 87.34 to 89.99 is a “B+”, 83.34 to 87.33 is a “B”, 80.00 to 83.33 is a “B-“, 77.34 to 79.99 is a “C+”, 73.34 to 77.33 is a “C”, Below 73.34 is an “F”. For Pass/Fail grading, a grade equivalent to a C or higher is required to pass.

Attendance and Late Work:
Class attendance is necessary to succeed in this course. However, there is no formal attendance policy. It is the student’s responsibility to stay current on class material. Late work will be penalized by one-half letter grade per day late unless prior

Course Proposal Cover Sheet (July 2012)
arrangements are made with the instructor. Apart from exceptional circumstances or prior arrangements made with the instructor, missed exams will receive a grade of 0.

**Academic Integrity:**
The University of Mary Washington does not tolerate academic dishonesty in any form. Penalties for cheating on exams or any other assignments in this course may include course failure and suspension or expulsion from the university. It is understood that all material submitted will be pledged in accordance with the Honor Code of UMW.

**Disability Accommodations:**
Accommodations will be made as needed as coordinated through the Office of Disability Resources.

**Tentative Schedule:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Start Date</th>
<th>Topics</th>
<th>Assignments (Black = Assigned, Red = Due)</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Linear Programming (part I), Introduction to supply chain concepts</td>
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<tr>
<td>2</td>
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<td>Linear Programming (part II)</td>
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<td>Integer Programming (part I)</td>
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<td>4</td>
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<td>Integer Programming (part II)</td>
<td>Exam 1</td>
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<td>Case Study 1</td>
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<td>5</td>
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<td>Network Design</td>
<td>Case study 2</td>
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<td>6</td>
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<td>Aggregate Planning</td>
<td>Case Study 1</td>
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<td>7</td>
<td></td>
<td>Inventory Models</td>
<td>Exam 2</td>
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<tr>
<td>8</td>
<td></td>
<td>Demand Forecasting</td>
<td>Case Study 2</td>
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