**Syllabus of Operations Management**

**Course Code:** MGMT 301

**Total Teaching Hours:** 48

**Total Credits:** 3

**Pre-required Courses:** Basic knowledge of Production & Operations Management

**Course Content and Description:**

The one thing that every company in the world does is forecasting. Another thing that almost every company does is endeavor to control costs. (Usually they do this by cutting back on expenses, but often an increase in capital expenditures results in lower long-term costs.) What they try to cut back on first is inventory. Reducing customer waiting and improving quality are other ways to reduce costs.

In today’s job market these are the areas where people can find ready employment. If you can improve the accuracy of the forecast for next year’s sales, if you can help reduce inventory costs without impacting customer service, and so on, you can find a good job. The main difference between this course and a standard POM course is that we will go into professional depth in a few topics rather than have a brief introduction to many topics.

This course is about these topics: the “nuts and bolts” of production, operations, and service enterprises. The course is thus a middle ground between general management courses and quantitative courses. The study of POM applies the quantitative material and discusses where, and to what extent, it is and is not applicable. Forecasting is covered in considerable depth because of its central importance in planning. Quality issues will be covered as will inventory management. After those topics, we will cover project management, and time permitting, waiting lines.

We will use Excel extensively, since mastery of Excel is virtually required in order to be considered for a job, and since it is such a powerful tool for simulating exactly those situations that are most in demand.

**Topics:**

1. **Intro to, and scope of, POM**

What POM is, who needs it, job opportunities

1. **Forecasting**

Time series (PROJECT), Multiple Regression and other methods

Accuracy and Control of Forecasts

Error Analysis

First Project – Forecasting

1. **Inventory Management & Planning**

Inventory is good! Inventory is bad!

Inventory models

Second Project – Inventory

1. **Waiting Line Management – Time permitting**

Customer service, expectations, and perceptions

Waiting lines, simulation

Third Project – Queuing

1. **Quality Measures and Control – Time permitting**

SPC, Process Capability, Sampling

First Test – Quality

1. **Project Management & Scheduling – Time permitting**

Gantt/PERT/CPM, Time Estimates, Simulation

Managing bottlenecks

Fourth Project – Project Management

FINAL EXAM

**Expected Outcomes:**

*Objectives:*

|  |  |
| --- | --- |
| 1. | Understand the fundamental nature of all business operations. |
| 2. | Apply Excel capabilities to: forecasting, inventory management, and customer service. |
| 3. | Understand the components of preparing a clear, persuasive report in grammatically correct English to management detailing your findings and recommendations for each of the above. |

*Expected Outcomes:*

|  |  |
| --- | --- |
| 1.1 | Understand how operations excellence underlies all successful businesses. |
| 2.1 | Master the technique of time series forecasting (TSF) using classical decomposition with non-linear trend-fitting. |
| 2.2 | Develop a spreadsheet to apply TSF to sales data of the student’s choice. |
| 2.3 | Master the technique of activity scanning simulation for inventory management. |
| 2.4 | Master the technique of event-driven simulation for customer service. |
| 3.1 | Write a good report detailing your findings and recommendations for your forecast. |
| 3.2 | Write a good report detailing your findings and recommendations for inventory management. |

*Competencies Achieved:*

|  |  |
| --- | --- |
| 1.1 | Explain, in clear persuasive English, the concepts of good operations management summarized by the ISO 9000/14000 standards “Say what you do. Do what you say. Prove it” and for continuous improvement “Fix the system, not the blame.” |
| 2.1 | Translate math formulas from books into Excel. |
| 2.2 | Translate “what you already know” into Excel. |
| 2.3 | Apply basic statistics and basic math to operations issues. |
| 3.1 | Compose and edit a good management report. |

Performance Measures:

*Knowledge*: Memory and recall of facts

Obj. Sample Questions

|  |  |
| --- | --- |
| 1.1 | What are the components of implementing good operations practices? |
| 2.1 | What are the Excel formulas for solving a system of 48 equations in 7 unknowns? |
| 2.2 | What are the Excel formulas for generating random demand that follows a trend? |
| 2.3 | What is the Excel formula for generating the inverse exponential function? |
| 3.1 | What is the primary purpose of a management report? |

*Comprehension*: Interpretation and description of facts

Obj. Sample Questions

|  |  |
| --- | --- |
| 1.1 | What’s the difference between “valid” data and “reliable” data? |
| 2.1 | Describe the characteristics of data that is amenable to TSF. |
| 2.2 | Describe lead-time variability, backorder percentage, and lost sales costs. |
| 2.3 | Describe the components of an M/M/1 queuing system. |
| 3.1 | What are the characteristics of an effective management report? |
| 3.2 | Why are both tables and graphs necessary? |

*Application*: Use of facts in novel situations

Obj. Sample Questions

|  |  |
| --- | --- |
| 1.1 | Apply the principles to UB for maintaining good learning facilities. |
| 2.1 | Use TSF to forecast a company’s sales. |
| 2.2 | Write an activity-scanning simulation for finding a good inventory policy for the next 90 days for ABC Corp. |
| 2.3 | Write an event-driven queuing simulation for service at Things-R-Us. |
| 3.1 | Prepare a report to management for each of the above. |

*Analysis*: Relationship and appropriateness of facts to specific components of a situation

Obj. Sample Questions

|  |  |
| --- | --- |
| 1.1 | Identify several appropriate measurements of faculty performance. |
| 1.2 | Identify several appropriate data requirements for those measurements. |
| 2.1 | Why can’t TSF be used for forecasting the DJIA? |
| 2.2 | What is the relationship between backorder percentage and lost sales cost? |
| 2.3 | What is the relationship among , μ, and ρ? |
| 3.1 | Identify two weaknesses in your report(s). |

*Synthesis*: Origination and integration of facts in both content and form of a situation

Obj. Sample Questions

|  |  |
| --- | --- |
| 1.1 | List the components of an operations QA program for UB’s faculty. |
| 1.2 | Modify the TSF program to allow the user to include or exclude the high-order term. |
| 2.1 | Modify the Inventory simulation to include fixed and variable operations costs. |
| 2.2 | Modify the queuing simulation to include multiple servers. |
| 3.1 | Write a report that integrates the TSF and the Inventory simulation. |

*Evaluation*: Ability to judge the value of facts for a particular situation.

Obj. Sample Questions

|  |  |
| --- | --- |
| 1.1 | How would your operations suggestions for the UB faculty improve your experience? |
| 2.1 | Can TSF and the Inventory simulation be expanded to include multiple products? |
| 2.2 | Is the exponential distribution for arrival and service times really justified? |
| 3.1 | How can your report(s) be improved? |

**Grading:**

Grades will be based on performance alone. Grades will not be based on one's effort, desire, or need. English skills, written and spoken, will be part of every student's grade on every assignment. See “My Grading Policy: Form and Substance” for a fuller explanation. *If you need a particular grade, to maintain your scholarship status, your athletic eligibility, or any other reason, the time to start working toward fulfilling that need is now.*

Assignment Value

Forecasting Project 20% [25%]

Inventory Project 20% [25%]

Queuing Project 10% [ 0%]

Class participation 10% 10%

Final Exam 40% [40%]

100%

**Text and Recommended Reading:**

There are lots of POM texts on the market. They are all essentially the same, in that they cover the same topics. They are also similar in the sense that they are all “survey” texts, offering only a brief introduction to 15 or 16 different topics. The real world is much more detailed and less simplistic than any standard text lets on. Therefore there is no required text for this course.

If you wish to buy a text (used, available online) you may. Nothing in those texts is “bad:” they all tell the truth, but not the whole truth.

**Standards**

The following is not necessary for most students, but it is necessary to have in writing.

1. **Classroom behavior:** Class begins at the scheduled time, not 5 minutes later. Once you enter the class, plan on staying. If you must leave, take your stuff and do not return. Leaving and reentering is considered rude. Attendance will be taken. Arriving late (after I’ve begun my lecture) counts as ½ of an unexcused absence. Leaving before the end of class counts as ½ of an unexcused absence. I will do my best to be as entertaining as the subject matter permits, but regardless of your interest in the material, sleeping during class will count as ½ of an unexcused absence. No hats, headsets, earplugs, or any other device in your ears.

2. **Cell phones in class:** Since Virginia Tech, emergency notification rules require that cell phones be allowed to be on during class. Set them to vibrate. Despite this, cell phones are not allowed during a test. (I will use mine for emergency notification.) *If a cell phone goes off during an exam, you will lose one letter grade for each ring.*

3. **Class participation and subjective grading:** I reserve the right to include a subjective component in your final grade. As fairly as I can, I will grade you on “how well you’ve mastered the material.” Please help yourself in this area by attending class, contributing to class discussion, not sleeping, not texting, and seeking help if you need it.

4. **English:** English is the language of instruction in American universities. If you are not now fluent in English, I expect a concerted effort to master the language, including but not limited to, a personal commitment to speak only English during the semester, *both in class and outside of class.* You *will* be graded on your use of English. (See also #6, below.)

5. **Homework:** Homework is very important; it is the primary mechanism by which you learn the material. It provides you with an opportunity to test yourself. Please note that ***late homework will not be accepted*.** If you have trouble with homework, please take advantage of office hours.

6. **Tests:** All tests will be full-period tests, i.e., 75 minutes. If you arrive late, you will not be given extra time. You may use one (1) page of handwritten notes, your book, and Google on all tests. If a calculator is needed, you may not use a cell phone calculator. International students may use a dictionary until midterms; after that time I will assume that you have developed a sufficient vocabulary.

7. **Final Exam:** The Final Exam will be comprehensive and very important for your final grade. If you do not do well on the Final Exam, you should not expect a good grade. As with other tests, if you arrive late you will not be given extra time. You may use three (3) pages of handwritten notes and your book on the final. You may not use cell phone calculators.

8. **Cheating is absolutely unacceptable in any guise.** If I catch you cheating, the first offense will result in an “F” for the assignment. The second offense will result in an “F” for the course. For graduate students, the first offense will result in an “F” for the course and being reported to the Disciplinary Committee. Cheating means using the work of others as your own. Copying homework, copying other students’ exam answers, using papers from the Internet, any talking or looking around during exams, allowing others to look at your exam papers, or anything else I mention during the semester, is cheating.

9. **Student Responsibilities:** Each student is responsible for coming to class on time, taking notes, buying and reading the text, asking questions about anything not understood or made sufficiently clear, doing assignments, turning them in on time, and keeping track of assignments and knowing which were submitted and which were not.

10. **My Responsibilities:** I am responsible for being on time and prepared for every class, to explain the material and its relevance clearly, at a pace that is a good balance between what is expected at a nationally accredited university and the ability level of a good “B” student, and to encourage and guide classroom discussions. *It is not my responsibility to entertain you, give you a good grade because you need it, or to make you feel good about yourself*. I’m delighted if that happens, but that’s on you.

11. **Personal problems:** Everyone has personal problems from time to time. Many people get sick occasionally. Cars break down, kids get sick, and so on. All I ask is that you notify me in advance of your inability to attend class. *You are responsible for the material presented in class whether or not you are present. You must make up the work and deadlines will not be extended* (except in extreme cases) but you will not be penalized. Do not whine or beg for retroactive consideration of personal problems.

12. **Mistakes:** Modern management allows for penalty-free mistakes in certain situations. In an effort to encourage experimentation, I encourage re-submissions of assignments based on my feedback. Once in a while, I will allow re-takes of exams. Do *not* assume that any particular test or assignment can be re-done.

13. **Office Hours:** I am on campus five days a week. My posted office hours are “walk-in” times. If those times are not convenient, we can probably arrange an appointment. Please take advantage of office hours – you are not bothering me and you have already paid for my time. If you do not like your final grade and have not availed yourself of office hours, do not expect any special consideration.

14. **General:** If you have a problem with any aspect of this course, come see me. *Do not come to me at the end of the semester with a sad story*; by then it’s too late. Do not ask, beg, or whine for extra work to improve your grade. If you are truly concerned about your grade, come see me *before* an assignment is due. I do not grant special favors to any student.

**My priorities, and therefore priorities that I expect:**

1. Family (This means your spouse, your kids, and those dependent on you. It does not mean your parents or siblings unless the occasion is life threatening. It does not mean grandparents, aunts, uncles, cousins, and more remote relations.)

2. Work that pays the rent. (This does not include internships or P/T work for pin money.)

3. School.

4. Everything else, including athletics, your social life, babysitting, and court appearances.

**Non-discrimination:**

Every one of you is a college student and is here voluntarily. I will not discriminate in my expectations based on race, gender, age, religion, economic circumstances, national origin, academic background, or anything else. I am not qualified to detect or diagnose any sort of learning disabilities. If you’ve been previously diagnosed as suffering from such a disability, show me a note with a phone number from a competent professional. Otherwise I expect that *everyone* can and will succeed.

**The Real World:**

UB’s motto is “Educating for the Real World.” I have sixteen years of professional experience in the world of business and know that there are two characteristics that every employer is looking for.

First, new graduates are expected to be capable of contributing to a team that is expected to accomplish a particular task. Consequently, working together on projects and homework is often encouraged. If you choose to work together on small teams, I expect that all members will contribute equally. I further expect that only one copy of the assignment will be turned in and will include the names of the two or three people who contributed. Sometimes, however, I will require individual work and in those cases working together constitutes cheating. I will be very clear about which is the case for every assignment.

Second, new graduates must interview for a job. These interviews are one-on-one, in-depth examinations of what you’ve learned.

Therefore, your performance as a team member and your personal mastery of the knowledge of the material covered on the assignment will be evaluated in combination. Both will be weighted approximately evenly. If you do homework as a team, and then do poorly on the exam, your contribution to the homework assignment will be re-evaluated. Also, the Final Exam will be comprehensive, individual, and relatively heavily weighted. Doing poorly on the Final Exam will result in a re-evaluation of all your previous work.

**UB’s Admissions Policy:**

UB has what can be called a liberal admissions policy. The good thing about such a policy is that students who have either a weak high school background, or who are academic “late-bloomers” have an opportunity to demonstrate that they can succeed in college that would not be available to them at a school with more demanding admissions requirements. I believe that this policy is socially valuable, but there are consequences that arise from such a policy.

One of the consequences of such a policy is that somewhat more qualified students can get a false impression of their ability when they compare themselves to less well-prepared classmates.

Part of my job is to uphold academic standards appropriate for entrance into the professional world. The fact that your performance is near the top of a particular class does not necessarily translate into a grade near the top of the academic scale. When I grade your work, it is the most accurate judgment I can make of what you’ve done. My grades are a combination of both your relative and your absolute performance. Your grade will indicate, as fairly as I can judge, how your performance compares to both your classmates’ and that expected of an entry-level professional.

Another consequence of a liberal admissions policy is that grades tend to be lower, since poorly prepared students, by definition, lack the basic math and/or English skills that are expected at a nationally accredited university. I will not penalize well-prepared students by taking class time to re-teach the basics. Students who are not comfortable with basic algebra and/or who cannot speak and write grammatically correct English with an adult vocabulary should expect to work extra hard, come often to office hours, and seek help at the ARC.

My Grading Policy: Form vs. Substance

What is the difference between “form” and “substance?” The short answer is that going through the motions is “form.” Following through, doing what you say, living according to your beliefs – that is “substance.”

In school, coming to class, taking notes, and doing homework, is “form.” In life, going to church (or wherever you worship), dressing well, having good intentions, saying the right thing – all that is “form.” Actually *understanding* how something works, actually *mastering* the material in this class, actually *behaving* according to your beliefs, actually *doing* what you say – that’s “substance.”

The motto of UB is “Educating for the Real World.” The real world does not care very much about form; it cares only about substance. When you graduate and offer yourself for employment you will find that “form without substance” is quickly discovered. To paraphrase Abraham Lincoln, “You can’t fool any of the employers any of the time.” If you have form without substance, you will go on interview after interview, being repeatedly dismissed as an “empty suit” and spreading the reputation of UB as a “diploma mill” far and wide. If I rewarded form without substance, I would be doing a terrible disservice to those students who *do* master the material, who have, in fact, the *substance* of a college education.

I’ve had students who complain at the end of the semester about getting a lower grade than they thought they deserved. Their complaints go like this. “I came to every class. I was always on time. I took all the notes. I did all the homework. I had a B at midterm. That has to count for something!” Well. As they say in math, that is “necessary, but not sufficient.” The *form* of studying, that is, coming to class, taking notes, doing homework, is necessary, but by itself, it is not sufficient for getting a good grade. To get a good grade in this class, you must master the material.

I cannot, and will not, reward form without substance. If you do not master the material, even perfect form will not rescue you. The Final Exam will be comprehensive and be a test of how well you’ve mastered the material. If you cannot demonstrate subject mastery on the Final Exam, you will not get a good grade, regardless of your “form” during the semester.

What this means for my grading policy is this. The Final Exam will count about 50% of your final grade. The rest will be distributed among class participation and in-term exams. The purpose of giving exams that don’t count for much is threefold. First, they are learning instruments. Second, they measure how well you’ve mastered the material of a particular section. Third, they introduce you to the kinds of tests I give. Every student needs not only to learn the material, but also to learn about the kinds of tests each professor gives.

The upside of this policy is that it’s never too late to do well in this class. I always offer the following guarantee: a perfect 100 on the Final Exam means an “A” in the course, no matter what. An “A” on the Final Exam means no worse than a “B-” in the course, no matter what. Pass the Final, pass the course, no matter what.

The downside is that you cannot “memorize and forget” each section that we cover. You must retain a working knowledge of each section that we cover for the entire semester. Come to think of it, that’s an upside, too!