CityUniversity of Seattle

Syllabus

SCHOOL OF MANAGEMENT

BAM 465: Manufacturing Operations

20 Credits
Effective: Summer 2016/2017

Access to the Internet is required.
All written assignments must be in Microsoft-Word-compatible formats.
See the library's APA Style Guide tutorial for a list of resources that can help you use APA style.

FACULTY

Faculty Name: FACULTY NAME

Contact Information: CONTACT INFORMATION

[INSTRUCTOR MAY INSERT PERSONAL MESSAGE IF DESIRED]

COURSE DESCRIPTION

This course is designed to meet the needs of students who want to move into supervisory and management roles in the manufacturing industry. Students will learn manufacturing operations management tools and techniques, and apply them to solve problems in the manufacturing industry. The course addresses the skills and knowledge in a wide range of key manufacturing technical and business areas including processes, systems and layout, quality control, cost control and regulation, and supply chain management. Emphasis is on the development of the critical thinking skills that are required for a successful career in a manufacturing management role.

COURSE RESOURCES

Required and recommended resources to complete coursework and assignments are found on the course Reading List. The Reading List can be found under Course Information in Blackboard as well as from the Library homepage.

Note: Required resources that must be purchased by the student are tagged "Purchase from a vendor of your choosing." Required resources with a direct link, "Available through CityU Library", are available at no cost to students.

Students in Canada will see required resources they need to purchase tagged "Purchase from the Canadian Bookstore." Students outside the U.S. and Canada should contact their advisor or textbook coordinator for additional information.

CITYU LEARNING GOALS

This course supports the following City University learning goals:

- Professional competency and professional identity

COURSE OUTCOMES

In this course, learners:

- Outcome 1 - Apply and interpret mathematical tools and techniques appropriate for use in assisting with manufacturing operations decision-making.

- Outcome 2 - Apply forecasting and demand-planning concepts and principles as they apply to manufacturing production planning and facility layout.
- Outcome 3 - Compare and contrast methodologies for continuous improvement and quality management.
- Outcome 4 - Explore and evaluate global sourcing options as they apply to creation of integrated logistics supply and inventory management systems.
- Outcome 5 - Develop and evaluate optimal industrial facility layouts that incorporate lean manufacturing concepts.
- Outcome 6 - Evaluate manufacturing workplace health and safety and management systems and their regulatory requirements.

CORE CONCEPTS, KNOWLEDGE, AND SKILLS

- Facility planning and layout
- Forecasting and demand planning
- Health and safety management
- Lean manufacturing concepts and application
- Mathematical tool selection, application and analysis
- Quality management
- Regulatory compliance
- Supply chain establishment and management

OVERVIEW OF COURSE GRADING

The grades earned for the course will be derived using City University of Seattle's decimal grading system, based on the following:

Overview of Required Assignments	***% of Final Grade***
Outcome 1 - Mathematical tool assessment	5%
Outcome 2 - Forecasting (Demand-planning) assessment	15%
Outcome 3 - Quality assessment	15%
Outcome 4 - Supply chain assessment	15%
Outcome 5 - Facility assessment	15%
Outcome 6 - Regulatory assessment	10%
Final Project - CapSim simulation	25%
TOTAL	**100%**

SPECIFICS OF COURSE ASSIGNMENTS

The instructor will provide grading rubrics that will provide more detail as to how this assignment will be graded.

Outcome 1 - Mathematical tool assessment

Mathematics in its simplest form can be defined as the study of measurements, numbers and quantities. Manufacturing in its simplest form can be defined as the production of goods in large quantities. The knowledge required to manufacture a product, a device, a process, or a system requires the use of mathematics. This assignment provides students the opportunity to study the theory of applied mathematics and how to apply this theory in a variety of manufacturing contexts. This assignment allows students to develop a fundamental knowledge and understanding of the mathematical techniques necessary to solve problems in the context of manufacturing engineering. The objective is not for students to become proficient as mathematicians, but to define the technique, understand the concepts behind the technique, and identify how it might be applied to assist in manufacturing decision-making.

In this assignment, students propose solutions to exercises/problems provided by their mentor covering the following specific areas:
1. Dealing with decimals & fractions
2. Reading a scale
3. Blueprint reading
4. Algebra
5. Trigonometry
6. Linear functions
7. Quadratic functions
8. Statistics
9. Calculus
10. Shop mathematics

Students will also prepare a 4-6 page paper that identifies and discusses at least 5 mathematical tools that are typically used in the manufacturing industry to assist in decision-making.

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	***% of Grade***
Mentor-provided Exercise	20%
Mathematical Tool Identification	30%
Mathematical Tool Application	30%
Mathematical Tool Assessment Report Style and Mechanics	20%
TOTAL	**100%**

Outcome 2 - Forecasting (Demand-planning) assessment

Forecasting requires both math and logic. Accurate sales forecasting is a key element to company success. Manufacturing too many units results in higher warehousing and inventory carrying costs. Manufacturing too few units could result in stock outs and lost sales opportunities, which can cost the company even more. Ultimately, forecasts drive a manufacturing facility, inventory and supply chain planning.

In this assignment students prepare a three-part report that (Part 1), describes various forecasting approaches; (Part 2), describes the influence that forecasts have on the manufacturing facility; and (Part 3), describes how a specific manufacturing company is influenced by internal and/or external forecasts (reference the associated site survey).

(Note – Initially students reviewed mathematical techniques associated with forecasting. Later modules

address logistical planning, supply chain management and facility layout in detail.)

Specific Instructions:
Part 1: Forecasting Methods Assessment
Specific requirement - Answer and justify the answers to the following questions:
What are the basic types of forecasts? What are their strengths and weaknesses?
Answers should include, but not be limited to an assessment of:
• Simple and Weighted Moving Average approaches
• Exponential Smoothing approach and
• Regression Analysis approaches
Part 2: Influence of the Forecast on the Manufacturing Facility
As the name suggests, forecasting is simply a projection of future business-or production-activity. The company must rely on effective production planning. Forecasting is the first step in production planning.
Specific Requirement - Describe how forecasting influences the following production planning decisions:
• Production capacity
• Materials handling
• Warehousing
• Staffing
Part 3: Manufacturing Site Survey
Visit a manufacturing site and discuss with management / supervision how forecasts have influenced their facility planning decisions. How accurate have their forecasts been historically? Include in assessment any recommendations for improvement.
Specific requirement – Document the findings.

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	***% of Grade***
Forecasting Methods	30%
Forecasting Impacts on Facility Planning	30%
Site Survey with Forecasting Focus	20%
Forecasting Assessment and Site Survey Report Style and Mechanics	20%
TOTAL	**100%**

<u>Outcome 3 - Quality assessment</u>

Having the right kind of manufacturing quality control system can contribute significantly to the company's bottom line. There are many different methods from which to choose, not all will work optimally in every manufacturing situation.

In this assignment, students prepare a two-part report that (Part 1), describes various quality control systems that can potentially be used in a manufacturing environment; and (Part 2), describes how a specific manufacturing company has implemented their quality control system (reference the associated site survey).

Part 1: Quality Methods Assessment
Specific requirement - Respond and justify answers to the following questions:
What are the basic types of manufacturing quality control systems? What are their strengths and weaknesses? What are their best applications in the manufacturing environment?

The answer should include, but not be limited to, an assessment of:
• PDCA quality control systems
• Total quality control (TQC)
• Six-sigma
• Pareto analysis
• Statistical quality control (SQC)
• Company-wide quality control (CWQC)
• Root-cause identification
• Statistical design of experimental concepts
• ISO 9000 standards compliance
Part 3: Manufacturing Site Survey
Visit a manufacturing site of the student's own choosing and discuss with management / supervision how they have implemented a quality control system. The assessment must include a survey of their employee and supplier involvement. Include in the assessment any recommendations for improvement.
Specific requirement – Document findings.

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	***% of Grade***
Quality System Identification	20%
Quality System Analysis	20%
Manufacturing Quality Application	20%
Site Survey with Quality Focus	20%
Quality Assessment and Site Survey Report Style and Mechanics	20%
TOTAL	**100%**

Outcome 4 - Supply chain assessment

Supply chain management is a cross-functional activity that includes managing the movement of raw materials into an organization, internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end consumer. As organizations strive to focus on core competencies and become more flexible, they have reduced their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced world-wide to other firms that can perform the activities better or more cost effectively. The foundations of supply chain management include the following areas:
• Supply Management
• Operations
• Distribution
• Integration

In this assignment students prepare a two-part report that (Part 1), assesses then current state-of-the-art in supply chain management; and (Part 2), describes how a specific manufacturing company has implemented their supply chain management system (reference the associated site survey).

Part 1: The Foundations of Supply Chain Management Assessment
Assess the current state-of-the-art in each of the following functional areas.
• Supply Management – including, but not limited to
o Supplier management and evaluation

o Supplier certification
o Strategic partnerships
• Operations – including but not limited to
o Material Requirements Planning (MRP)
o Enterprise Resource Planning (RPS) – and its relationship to MRP
o Just-In-Time (JIT) Inventory Systems
• Distribution – including but not limited to
o Distribution networks
o Customer Relationship Management (CRM)
o Global supply chains
• Integration – including but not limited to
o Process integration
o Performance measurement

Part 2: Manufacturing Site Survey
Visit a manufacturing site of the student's own choosing and discuss with management / supervision how they have implemented supply chain management in their organization. Include an assessment of whether the organization is product-oriented or process-oriented. Also include in the assessment any recommendations for improvement.
Specific requirement – Document findings.

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	***% of Grade***
Supply Management Assessment	15%
Supply Operations Assessment	15%
Supply Distribution Assessment	15%
Supply Integration Assessment	15%
Site Survey with Supply Chain Focus	20%
Supply Chain Assessment and Site Survey Report Style and Mechanics	20%
TOTAL	**100%**

Outcome 5 - Facility assessment

In manufacturing, facility layout consists of configuring the plant site with lines, buildings, major facilities, work areas, aisles, and other pertinent features such as department boundaries. Because of its relative permanence, facility layout is one of the most crucial elements affecting efficiency. An efficient layout can reduce unnecessary material handling, help to keep costs low, and maintain product flow through the facility.

In this assignment students design a lean manufacturing facility layout. The product to be manufactured is one of the student's own choosing, but the layout must comply with the following:
• All four manufacturing functional areas identified in Assignment #4 must be addressed
o Supply Management
o Operations
o Distribution
o Integration
• The layout must accommodate lean manufacturing production approaches

• The layout must reflect one of the following layout types (depending on the product selected):
o Product
o Process
o Fixed-Position
o Cellular

Specific deliverables:
1. A block diagram of the plant layout, with work flow indicated.
2. A narrative description of the facility that describes how the four functional areas are accommodated and managed.

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	***% of Grade***
Plant Layout Diagram	20%
Facility Description Technical Content	60%
Facility Description Report Style and Mechanics	20%
TOTAL	**100%**

Outcome 6 - Regulatory assessment

Under OSHA law employers must provide employees with a workplace that does not have serious hazards and follow all relevant OSHA safety and health standards. This means not just providing personal protective equipment, for example. The employer has the responsibility to look for unsafe working conditions and correct them. Therefore, a health and safety program with a documented process, outlining specific actions and responsibilities is mandatory. Scheduling regular training for employees is also a key part of any program, including hazardous material handling, spill control, forklift training, ladder safety, and many more specific safety training sessions associated with a manufacturing environment.

In this assignment students prepare a two-part report that (Part 1), provides a formal Health and Safety Corporate Policy document, and (Part 2), describes how a specific manufacturing company has implemented their Safety and Health program.

Part 1: Corporate Safety and Health Policy document
(The Policy is to be associated with the corporate facility designed in Assignment #5.)
At a minimum, the Policy must address the following:
• A Corporate Safety & Health Policy Statement
• Safety & Health Goals
• New Employee Orientation
• Safety & Training Courses
• Employee Responsibilities
• Accident Investigation/Reporting Procedures
• Personal Protective Equipment Safety Rules
• Safety Committee Emergency Action Plan
• Safety Discipline Employee Confirmation

Part 2: Manufacturing Site Survey
Visit a manufacturing site of the student's own choosing and discuss with management / supervision how they have implemented a Safety and Health program in their organization. Also include in the assessment

any recommendations for improvement.
Specific requirement – Document findings.

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	***% of Grade***
Safety and Regulatory Issue Identification	20%
Safety and Regulatory Policy Document Technical Content	40%
Site Survey with Safety and Regulatory Focus	20%
Safety and Regulatory Policy Document Style and Mechanics	20%
TOTAL	**100%**

Final Project - CapSim simulation

Time to put Manufacturing in perspective. Students will be participating in a computer simulation where they are put in charge of a sensor manufacturing company. Their company was created when the government split a monopoly into six identical competitors. Students will make executive-level decisions in six (6) functional areas:
1. Research & Development – (what products to design and manufacture)
2. Marketing – (including development of a sales forecast to be provided to the factory)
3. Production – (how many to build / how much automation to incorporate / how to manage inventory)
4. Finance – (how to pay for all this)
5. Human Resources - (including how to handle employee strikes)
6. Quality – (effects of quality initiatives on factor productivity)
Specific Requirement: Register with CapSim (The Mentor will provide specific instructions), and manage the company for a 8 years.

This Assignment consists of 2 parts:
• Part 1 – Manage a company for a total of 8 (simulated) years in a competitive environment in the CAPSIM simulation. Complete all 8 years of competition. Complete instructions and tutorials are contained on the CAPSIM web site www.capsim.com .
• Part 2 – CAPSIM Assessment Report - Based on what you learned as a result of running the CAPSIM simulation, prepare a 4-6 page report that describes the impacts that executive-level decisions in the following areas have on the manufacturing environment:
o Research & Development (R&D) decisions
o Marketing decisions
o Production decisions
o Finance decisions
o Quality decisions
o Human Resource (HR) decisions

Students may propose an alternative project of their own design that shows attainment of the corresponding course outcome. The mentor must approve the alternative project.

Components	*% of Grade*
CapSim Simulation	40%
CapSim Assessment Report Technical Content	40%
CapSim Assessment Report Style and Mechanics	20%
TOTAL	**100%**

COURSE POLICIES

Professional Writing

Assignments require error-free writing that uses standard English conventions and logical flow of organization to address topics clearly, completely, and concisely. CityU requires the use of APA style.

UNIVERSITY POLICIES

You are responsible for understanding and adhering to all of City University of Seattle's academic policies. The most current versions of these policies can be found in the **University Catalog** that is linked from the CityU Web site.

Non-Discrimination & Prohibition of Sexual Misconduct

City University of Seattle adheres to all federal, state, and local civil rights laws prohibiting discrimination in employment and education. The University is committed to ensuring that the education environment is bounded by standards of mutual respect and safety and is free from discriminatory practices.

In the U.S., the University is required by Title IX of the Education Amendments of 1972 to ensure that all of its education programs and activities do not discriminate on the basis of sex/gender. Sex include sex, sex stereotypes, gender identity, gender expression, sexual orientation, and pregnancy or parenting status. Sexual harassment, sexual assault, dating and domestic violence, and stalking are forms of sex discrimination, which are prohibited under Title IX and by City University of Seattle policy. City University of Seattle also prohibits retaliation against any person opposing discrimination or participating in any discrimination investigation or complaint process internal or external to the institution. Questions regarding Title IX, including its application and/or concerns about noncompliance, should be directed to the Title IX Coordinator. For a complete copy of the policy or for more information, visit https://my.cityu.edu/titleix or contact the Title IX Coordinator.

In Canada, in compliance with the British Columbia Human Rights Code, the Alberta Human Rights Act, WorksafeBC, and the Workers' Compensation Board of Alberta, the University believes that its environment should at all times be supportive and respectful of the dignity and self-esteem of individuals. Discrimination, harassment and bullying conduct, whether through person to person behaviour or via electronic communications such as email or social media is not acceptable and will not be tolerated. As an educational institution, it is our responsibility to cultivate an environment of excellence, equity, mutual respect and to recognize the value and potential of every individual. The University will take all necessary steps to meet or exceed the

requirements of the law to prevent discrimination, harassment and bullying. The Respectful Workplace Policy for the prevention of discrimination, harassment and bullying policy and procedure can be found at https://www.cityu.edu/discover-cityu/about-cityu/ under the Policies section or at https://www.cityuniversity.ca/about/.

Religious Accommodations

City University of Seattle has a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The University's policy, including more information about how to request an accommodation, is available in the University Catalog and on the my.cityu.edu student portal. Accommodations must be requested by the 20% mark of this course (e.g. day 14 of a ten-week course, day 7 of a 5-week course) using the Religious Accommodations Request Form found on the student dashboard in the my.cityu.edu student portal.

Scholastic Honesty

Scholastic honesty in students requires the pursuit of scholarly activity that is free from fraud, deception and unauthorized collaboration with other individuals. You are responsible for understanding CityU's policy on scholastic honesty and adhering to its standards in meeting all course requirements. A complete copy of this policy can be found in the University Catalog in the section titled *Scholastic Honesty* under *Student Rights & Responsibilities*.

Attendance

Students taking courses in any format at the University are expected to be diligent in their studies and to attend class regularly.

Regular class attendance is important in achieving learning outcomes in the course and may be a valid consideration in determining the final grade. For classes where a physical presence is required, a student has attended if s/he is present at any time during the class session. For online classes, a student has attended if s/he has posted or submitted an assignment. A complete copy of this policy can be found in the University Catalog in the section titled *Attendance Policy for Mixed Mode, Online and Correspondence Courses*.

SUPPORT SERVICES

Disability Services Accommodations Statement

Students with a documented disability who wish to request academic accommodations are encouraged to contact Disability Support Services to discuss accommodation requests and eligibility requirements. Please contact Disability Support Services at disability@cityu.edu or 206.239.4752 or visit the Disability Support Services page in the my.cityu.edu portal. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors.

Library Services

CityU librarians are available to help you find the resources and information you need to succeed in this course. Contact a CityU librarian through the Ask a Librarian service, or access library resources and services online, 24 hours a day, seven days a week.

Smarthinking

As a CityU student, you have access to 10 free hours of online tutoring offered through Smarthinking, including writing support, from certified tutors 24 hours a day, seven days a week. Contact CityU's Student Support Center at help@cityu.edu to request your user name and password.