



OPIM 322 HIGH PERFORMANCE WAREHOUSING AND FULFILLMENT

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COURSE DESCRIPTION

As the world becomes more globalized many companies achieve competitive advantage by paying substantial attention on effective supply chain design and operations. Warehouses are consolidation hubs of various products in a supply chain. To support business that covers a wide range of markets it is common for a warehouse to store hundreds of thousands of products. These products pass through the warehouse in huge volume daily, and so it is important to run the warehouse efficiently. Besides the traditional storage function, warehouses are increasingly forced to perform responsive and accurate customer order fulfillment and other value-added services. High performance in product warehousing and order fulfillment becomes crucial to the success of many companies in today's competitive business environment. We will introduce various operation models that are theoretically appealing and practically feasible. Some case studies will also be discussed. *This course is especially useful for those who are interested in consulting careers in logistics and supply chain management.*

LEARNING OBJECTIVES

After taking this course students will be able to analyze the business in warehousing and fulfilment and then recommend process improvements that significantly improve the value of this business.

More specifically, students will be able to:

- Explain the demand faced by a warehouse
- Describe WMS and various storage and handling equipment
- Design efficient warehouse layouts considering various constraints and costs
- Describe the advantages and disadvantages of various order-picking policies
- Discuss the rationale of cross-docking and the designs of cross-docks

PRE-REQUISITE/ CO-REQUISITE/ MUTUALLY EXCLUSIVE COURSE(S)

Please refer to the Course Catalogue on OASIS for the most updated list of pre-requisites / co-requisites for this particular course.

Do note that if this course has a co-requisite, it means that the course has to be taken together with another course. Dropping one course during BOSS bidding would result in both courses being dropped at the same time.

ASSESSMENT METHODS

Group Project:	30 %	
Mid-Term Exam:	30 %	(Week 7)
Final Exam:	30 %	(Week 15)
Class Participation:	10 %	(Throughout the term)
Total:	100%	

RECOMMENDED TEXT AND READINGS

Authors: Bartholdi and Hackman

Title: Warehouse and Distribution Science

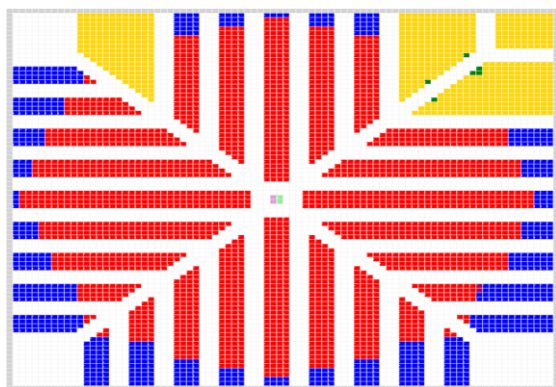
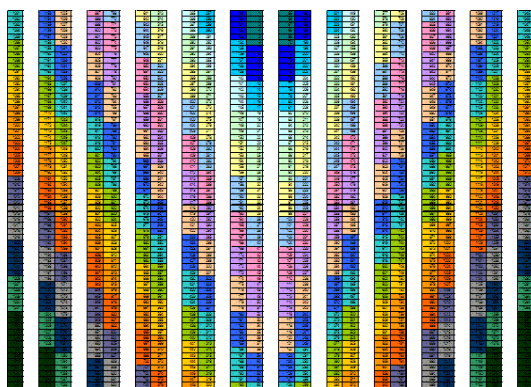
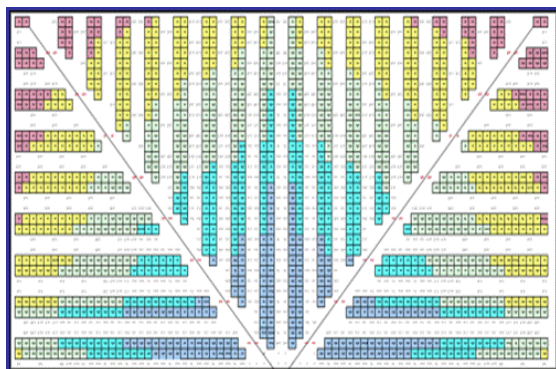
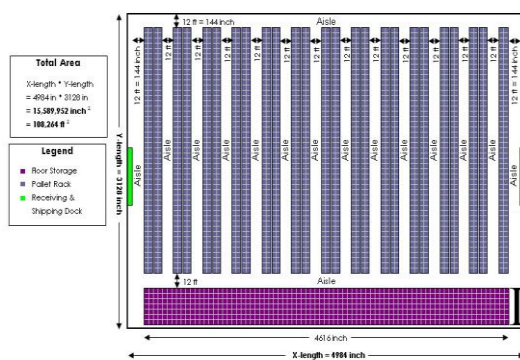
Publisher: School of Industrial and Systems Engineering, Georgia Institute of Technology (Available at <http://www.tli.gatech.edu/whscience/>, it is free!)

Copies of lecture slides will be provided in class meetings.

INSTRUCTIONAL METHODS AND EXPECTATIONS

In addition to lectures, we will discuss the topics through the following class activities and group projects:

- **Bucket Brigade Exercise:** A few students will be invited to simulate the operations of a bucket brigade order-picking line in class. Other students will observe and record the performance of the bucket brigade protocol, which will be compared with a traditional approach.
- **Warehouse Tour:** Students will visit a distribution center during the semester. This will be a great chance for them to see how a warehouse operates in the real world. Students will also experience various aspects of the working life of professionals in logistics and supply chain management. Companies that we have visited include DHL, UPS, Keppel Logistics, and YCH.
- **Guest Lecture:** An industry speaker will give a lecture during the semester. Students will learn the business model, operations, and challenges of the company. This will be a good opportunity for the students to get in contact with professionals in logistics and supply chain management. Our guests are from leading companies in the industry such as DHL, UPS, and P&G.
- **Project:** Students will form groups to work on a consulting project based on real data collected from a company. They are expected to submit a report and make a presentation for the project. Some examples of the project are shown below.



CLASS SCHEDULE

Weeks	Topics	Remarks
1	Introduction, Material Flow, and Operations	Brief Survey/Project Begins
2	Warehouse Management Systems, Storage and Handling Equipment	
3	Layout (Pallets)	
4	Layout (Cartons)	
5	Layout (Pieces)	
6	Warehouse Tour	
7	Mid-Term Exam	
8	Mid-Term Break	
9	Order Picking (Bucket Brigades)	Bucket Brigade Exercise
10	Order Picking (Pick Paths) and Guest Lecture	
11	Cross-Docking	
12	Presentations for The Project	
13	Activity Profiling	
14	Final Review	