Course Syllabus of Operations Management
Spring 2026

Instructor: **Wenqiang Xiao**
Office hour: **By appointment**
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Learning Goals

- **Analyze Firms' Strategies**

Develop the ability to critically analyze firms' **Supply, Inventory, and Demand (SID)** strategies across industries and contexts.

- **Perform SID Planning**

Apply quantitative and qualitative tools to conduct **SID planning**, including forecasting, material resource planning, and sales & operations planning.

- **Integrate SID Analysis with Financial Insights**

Connect SID analysis to **traditional financial metrics** (e.g., revenue growth, profit margins, working capital metrics, operating cash flow, free cash flow) and incorporate it into **investment theses, strategic recommendations, and industry reports**.

Course Schedule

Part I: Supply, Inventory, and Demand (SID) Investment Thesis

- Investment Thesis Based on SID–Guidance Misalignment – Feb 2
- Tech/AI Supply Chain and Cases (TBD based on the stock market) – Feb 2

Part II: SID Strategies and Planning

- Cases: Beer Game, P&G, Apple, Carvana – Feb 9, 23
- Sales & Operations Planning (S&OP), Material Requirements Planning (MRP I), and Manufacturing Resource Planning (MRP II) – Mar 2
- Case: Liquor Store SID Planning – Mar 9
- Case: Apparel Retail Chain SID Planning – Mar 9
- Case: Deloitte Consulting on SID Planning – Mar 23

Exam I (Take-home):

- Date: Mar 28 to 29
- Format: Downloadable from Brightspace Assignments

Part III: SID Analysis of Companies

- **Semiconductors:** TSMC, Nvidia – Mar 30
- **Fast Fashion:** Zara, H&M – April 6
- **Athleisure:** Lululemon, Deckers – April 13
- **Pharmaceuticals:** McKesson – April 20
- **E-commerce:** Amazon – April 27
- **Group Presentations: Company SID Analysis** – May 4

Exam II (Take-home):

- Date: May 8 to 10
- Format: Downloadable from Brightspace Assignments

Grading Scheme

Class Attendance and Engagement	10%
In-class Excel-based Exercises (Group of 3)	10%
Exam I	30%
Exam II	30%
Company Analysis (Group of 5)	20%

Class Attendance and Engagement
Attendance is expected for every class session. If you must miss a class for a legitimate reason, please notify me in advance. During class, professionalism and respect are required. This includes being attentive, considerate of others, and refraining from using laptops, cell phones, texting, emailing, or reading unrelated materials. **Laptop is required for every class but used only for the in-class exercises, games, and AI analysis.** Your grade for this component will be based on attendance and active participation.

In-Class Excel Exercises
Some classes will include Excel-based exercises, which may not be announced in advance. Group leaders must submit the results via Brightspace Assignments by the end of the class. Late submissions due to a legitimate reason will be accepted for full credit if communicated in advance.

Company Analysis Project

Goal: Use the Supply–Inventory–Demand (SID) framework to explain a public company's past financial performance (2023–2026) and form an investable view on its forward trajectory, culminating in a clear Buy / Hold / Sell recommendation.

What You Will Deliver

- Slide Deck (≤ 8 slides) focused on key SID drivers and latest-quarter takeaways.
- Word Report (≤ 10 pages) with data exhibits and concise explanations.
- Due: April 27, 11:59 PM ET on Brightspace.
- Presentations: May 4 (10–15 min each team).

Process (7 Steps)

1) Form & Choose

- Finalize roster of five and a public company. Create a shared workspace with roles (Lead Analyst, Data Owner, Slides Owner, QA/Fact-check, Presenter). Prefer firms where SID signals are visible (e.g., backlog, book-to-bill, channel inventory, capacity expansions, lead-times, promotions/ASP, DSO/DIO/DPO, CCC, etc.).

2) Generate the Baseline SID Analysis (2023–2026)

Use an LLM with Deep Research to produce a data-tied SID readout. Example prompt (adapt as needed):

"Perform a supply, inventory, and demand (SID) analysis of {Company}, including financial data from 2023–2026. Tabulate revenue, gross margin, operating margin, inventory, DIO/DSO/DPO/CCC, segment/geo mix, unit vs. ASP (if applicable), backlog/book-to-bill, capacity/capex and lead-time signals, channel inventory/promotions. Provide quarter/period labels and source each data point (10-K/10-Q, call transcript, IR deck). Highlight the 5–8 most important SID drivers."

Expected output: A draft SID fact base: time-series tables, 5–8 bullet SID insights, and citations you can verify.

3) Diagnose the SID Drivers

- Read the AI output critically. Keep what is true, fix what is wrong, fill what is missing.
- Summarize why the company succeeded/struggled: causality from supply → inventory → demand → financials.

- Produce a 1-page SID Driver Summary (your language, not the AI's), prioritized by impact.

4) Latest Fiscal Quarter Deep Dive

Run a second AI analysis focused on the most recent reported quarter. Example prompts:

"Identify the driving forces of {Company} performance in the latest fiscal quarter. Split by Supply / Inventory / Demand, quantify where possible (units, ASP, mix, utilization, pricing, promotions, cost, yield), call out one-offs vs. structural, and include the management guidance context."

Expected output: A 1–2 page Quarter Driver Readout and a driver table/waterfall.

5) Sustainability & Recommendation

- For each positive driver, assess durability (cycle, structural, competitive moat, policy/regulation, supply constraints easing/tightening).
- For each negative driver, assess severity and repairability (timelines, capex/opex needs, pricing power, channel normalization, inventory burn-down path).
- Conclude with Buy / Hold / Sell and the few metrics you will watch for confirmation.

6) Instructor Meeting (20 minutes)

- Come with your SID Driver Summary, Quarter Driver Readout, and a draft slide outline.

7) Final Submission & In-Class Presentation

- Upload PPT (≤ 8 slides) and Word (≤ 10 pages) to Brightspace by April 27, 2026.
- Present May 4. Time your talk; leave room for Q&A.

Using AI Well (and Safely)

- Always verify numbers against primary sources (10-K/10-Q, transcripts). Fix AI mistakes.
- Date-stamp every figure and cite the underlying source.
- Prefer quarterly granularity for 2023–2026.
- Make the AI work for you: ask for tables, definitions (e.g., CCC), causal links, and alternative hypotheses.

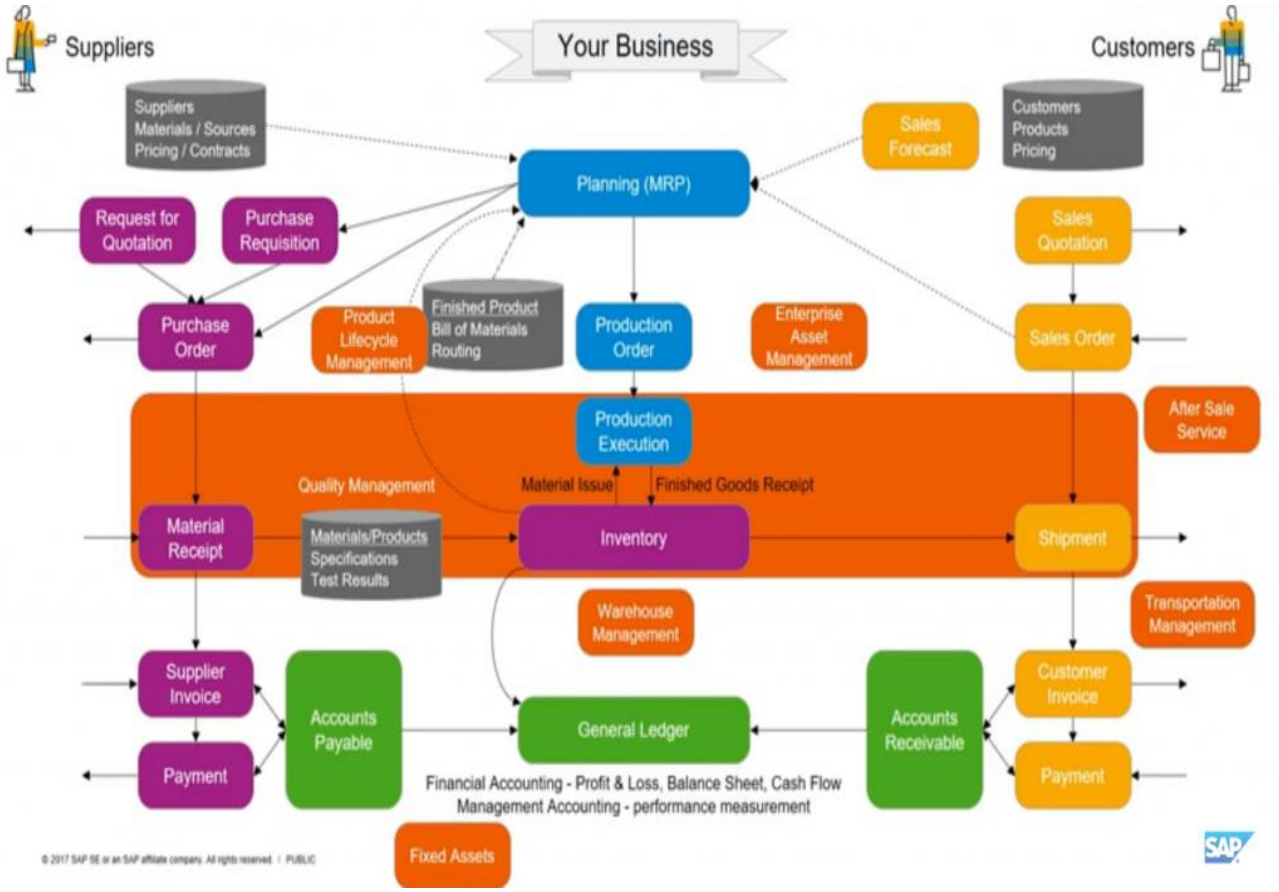
Quality Bar (Rubric & Weights)

1. Depth of SID Diagnosis (50%) – clear causal link from supply/inventory/demand to financial outcomes; prioritization by impact.
2. Latest-Quarter Analysis (30%) – crisp identification/quantification of drivers; separation of one-offs vs structural; realism of bull/base/bear and KPI watchlist.
3. Clarity & Communication (20%) – charts that speak, tight writing, time-boxed delivery.

A-level work connects SID drivers to P&L, balance sheet, and cash flow with verified data, quantifies impacts, and states falsifiable forward triggers.

Tip: If your conclusion is Hold, that's fine—just support it rigorously. If the SID signal is weak, you may optionally pick a second company with a stronger signal, but this is not required.

Background of Supply, Inventory and Demand (SID)



SID stands for **Supply, Inventory, and Demand** — a structured framework used to analyze a firm's operations and strategic fundamentals by examining the **flow of goods and services**, from **sourcing and production (supply)**, through **stocking and logistics (inventory)**, to **end-market sales (demand)**.

It is especially useful in:

- **Operational strategy**
- **Fundamental analysis of companies**
- **Supply chain risk management**
- **Investment and valuation decisions**

Component	Focus	Key Questions	Example Metrics
Supply	Upstream sourcing & production	Can the company fulfill future demand? What are its cost drivers and constraints?	Capacity utilization, supplier concentration, lead time
Inventory	Midstream stock & logistics	How efficiently is inventory managed? Are there risks of stockouts or overstocking?	Inventory days, turnover, write-downs, buffer stock
Demand	Downstream sales & customer trends	Is customer demand strong, stable, or declining? Does the firm have pricing power?	Sales growth, order backlog, channel mix, ASP (average selling price)

SID Analysis of Companies

The **SID framework** enables a structured, operations-informed analysis of how firms perform within industries — by examining upstream capacity and cost (Supply), midstream efficiency (Inventory), and downstream market strength (Demand). It integrates **supply chain insights with strategic positioning** and **financial fundamentals**.

Framework Structure: Industry vs. Company-Level SID Analysis

Element	Industry-Level Focus	Company-Level Focus
Supply	Structural capacity, input dependencies, regulatory constraints	Sourcing strategy, production flexibility, supplier risk
Inventory	Industry-wide inventory cycles, seasonal trends, capital intensity	Inventory turnover, lean/JIT models, buffer stock management
Demand	End-market trends, macro drivers, buyer concentration	Brand strength, channel mix, pricing power, customer loyalty

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Step-by-Step Approach

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1. Demand Analysis

Industry-Level

- Market size & growth rate
- Demand cyclicality or seasonality
- Key trends (e.g., sustainability, digitization, aging population)
- B2B vs. B2C demand dynamics

Company-Level

- Revenue growth vs. peers
- ASP trends, sales mix

- Channel evolution: DTC, retail, online
- Customer retention & pricing power

Key Question:
Is the firm positioned to **benefit from demand tailwinds** or **resilient in a slowdown**?

Example: EV market is growing fast, but legacy automakers differ in ability to capture it (e.g., BYD vs. Ford vs. GM).

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2. Inventory Analysis

Industry-Level

- Inventory-to-sales trends (macro view)
- Industry bullwhip effect or overstocking risks
- Inventory financing norms (retail vs. pharma vs. semiconductors)

Company-Level

- Inventory days vs. industry average
- Inventory strategy: fast turnover vs. premium buffer
- Obsolescence/write-down risk
- Inventory allocation across geographies

Key Question:
Is the company managing inventory **efficiently,** or is it vulnerable to **cash flow pressure or markdowns**?

Example: Target in 2022 had inventory bloat due to demand misforecasting, leading to margin erosion.

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3. Supply Analysis

Industry-Level

- Concentration of supply (e.g., TSMC in chips)
- Input cost trends (raw materials, labor, energy)
- Regulatory or geopolitical exposures
- Industry-wide capacity bottlenecks

Company-Level

- Supplier concentration and lead time
- Vertical integration vs. outsourcing

- Cost structure resilience (variable vs. fixed)
- Localized production and ESG compliance

Key Question:
Does the company have a **resilient and cost-effective supply base** compared to its competitors?

Example: Lululemon controls a smaller, agile supply base with DTC dominance; Adidas is more diversified but exposed to wholesale inventory risks.

Putting It All Together: Comparative SID Table

SID Element	Industry Benchmark	Company A	Company B
Demand	High-growth, price-sensitive	Strong ASPs, DTC shift	Weak pricing, wholesale-dependent
Inventory	Elevated post-COVID	Lean, fast turnover	Buildup, markdown risk
Supply	Cost pressures rising	Localized, flexible	High reliance on offshore suppliers

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- Exercise integrity in all aspects of one's academic work including, but not limited to, the preparation and completion of exams, papers and all other course requirements by not engaging in any method or means that provides an unfair advantage.
- Clearly acknowledge the work and efforts of others when submitting written work as one's own. Ideas, data, direct quotations (which should be designated with quotation marks), paraphrasing, creative expression, or any other incorporation of the work of others should be fully referenced.
- Refrain from behaving in ways that knowingly support, assist, or in any way attempt to enable another person to engage in any violation of the Code of Conduct. Our support also includes reporting any observed violations of this Code of Conduct or other School and University policies that are deemed to adversely affect the NYU Stern community.

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For graduate students, information can be found here: https://www.stern.nyu.edu/uc/codeofconduct.

To help ensure the integrity of our learning community, prose assignments you submit to NYU Brightspace will be submitted to Turnitin. Turnitin will compare your submission to a database of prior submissions to Turnitin, current and archived Web pages, periodicals, journals, and publications. Additionally, your document will become part of the Turnitin database.

GENERAL CONDUCT & BEHAVIOR

Students are also expected to maintain and abide by the highest standards of professional conduct and behavior. Please familiarize yourself with Stern's Policy in Regard to In-Class Behavior & Expectations for Graduate and Undergraduate students. (https://www.stern.nyu.edu/portal-partners/registrar/policies-procedures/general-policies/code-conduct) (http://www.stern.nyu.edu/portal-partners/current-students/undergraduate/resources-policies/academic-policies/index.htm) and the NYU Student Conduct Policy (https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-student-conduct-policy.html).

STUDENT ACCESSIBILITY

If you will require academic accommodation of any kind during this course, you must notify me at the beginning of the course and provide a letter from the Moses Center for Student Accessibility (212-998-4980, mosescsa@nyu.edu) verifying your registration and outlining the

accommodations they recommend. If you will need to take an exam at the Moses Center for Student Accessibility, you must submit a completed Exam Accommodations Form to them at least one week prior to the scheduled exam time to be guaranteed accommodation. For more information, visit the CSA website: https://www.nyu.edu/students/communities-and-groups/student-accessibility.html

STUDENT WELLNESS

Our aim is for students to be as successful academically as they can, and to help them overcome any impediments to that. Any student who may be struggling and believes this may affect their performance in this course is urged to contact the Moses Center for Student Accessibility (see also the Student Accessibility section of this syllabus) at 212-998-4980 to discuss academic accommodations. If mental health assistance is needed, call the NYU's 24/7 Wellness Exchange hotline 212-443-9999. Furthermore, please approach me if you feel comfortable doing so. This will enable me to provide relevant resources or referrals. There are also drop in hours and appointments. Find out more at http://www.nyu.edu/students/health-and-wellness/counseling-services.html
Graduate students can also reach out to the Academic Advising team at academicaffairs@stern.nyu.edu if you would like to receive more information or further support.

NAME PRONUNCIATION AND PRONOUNS

NYU Stern students now have the ability to include their pronouns and name pronunciation in Albert. I encourage you to share your name pronunciation and preferred pronouns this way. Please utilize this link for additional information: Pronouns & Name Pronunciation

RELIGIOUS OBSERVANCES AND OTHER ABSENCES

NYU's Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. You must notify me in advance of religious holidays or observances that might coincide with exams, assignments, or class times to schedule mutually acceptable alternatives. Students may also contact religiousaccommodations@nyu.edu for assistance.

NYU Stern is committed to ensuring an equitable educational experience for all students regardless of identity or circumstances and strives to recognize the obligations its students have outside of Stern. Please review all class dates at the start of the semester and review all course requirements to identify any foreseeable conflicts with exams, course assignments, projects, or other items required for participation and attendance. If you are aware of a potential conflict, please contact me as soon as possible to discuss any potential conflicts to determine whether/how they can be accommodated.

LAPTOPS, CELL PHONES & OTHER ELECTRONIC DEVICES

Due to the nature of this class and the potential disruptions caused by student use of electronic devices, students are not permitted to use any such devices during class without explicit permission from the instructor.