



JINDAL GLOBAL
BUSINESS SCHOOL
INDIA'S FIRST MULTI-DISCIPLINARY GLOBAL BUSINESS SCHOOL



O.P. Jindal Global University
A Private University Promoting Public Service
NAAC Accreditation - 'A' Grade

Jindal Global Business School

Course Outline

Course Title	Next-Generation Warehouse Operations
Core or Elective	Elective
Program and Batch	MBA-2025, IBM-2022, IBM-2023
Semester & Academic Year	Fall 2026
Credits	1.5
Discipline/Area	Operations Management & Supply Chain
Name of the Faculty Member/Course Instructor	Professor SAROJ KOUL
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Faculty Member's Open Office Day/s & Time	TBA

Introduction to the Course

Warehousing has transformed from a passive storage function into a strategic hub in global supply chains. In today's digital era, warehouses are intelligent ecosystems integrating robotics, automation, IoT, AI, and advanced analytics. This elective, ***Next-Generation Warehouse Operations***, equips MBA students with frameworks and applied skills to design and manage modern warehouse systems. Benchmarking against leading programs globally, the course embeds AACSB rubrics, Bloom's Taxonomy, and industry immersion to ensure rigour and relevance.

Structured into four modules (Foundations, Robotics in Warehousing, Smart Warehouse Systems, and Future Logistics Systems) the course blends theory from Gwynne Richards' *Warehouse Management* (Kogan Page, 5th edition, 2025) with short journal articles and compact Harvard Business School cases. Students will explore autonomous mobile robots, AGVs, robotic picking, IoT-enabled visibility, AI-driven inventory optimisation, digital twins, drone-based monitoring, and workforce transformation. The experiential component includes an industry visit to the Sonipat logistics cluster and student presentations on applied case studies.

By the end of the course, students will view warehousing as a strategic enabler in supply chains, apply digital tools to optimise operations, and critically assess ethical and sustainability implications of smart fulfilment. Graduates will be prepared to lead in technologically advanced, globally integrated, and socially responsible logistics environments.

Course Learning Objectives

At the end of the course, students should be able to

1. **CLO1:** Understand what next-generation warehouse operations are and how they have evolved locally and globally.
2. **CLO2:** Apply robotics, IoT, AI, and digital twin technologies to optimise warehouse operations.
3. **CLO3:** Analyse warehouse systems as strategic hubs in supply chains, integrating technology with business models.
4. **CLO4:** Evaluate ethical, workforce, and sustainability implications of smart fulfilment systems.
5. **CLO5:** Communicate insights effectively through case analysis, presentations, and applied projects.

Programme Competency Goals

MBA Programme Competency Goals (PCGs)		MBA Programme Learning Objectives (PLOs) Students will be able to
1	Technological Agility: Ability to adopt relevant technologies for better business decision making.	1. Understand relevant business technologies
		2. Understand future technologies in business domain
2	Responsible Global Citizenship: Ability to understand the interplay between local and global issues and to act with sensitivity towards ethical and social issues	3. Understand the interplay between local and global business issues
		4. Demonstrate sensitivity towards ethical issues
		5. Demonstrate sensitivity towards social issues
3	Effective communication: Ability to effectively exchange ideas and information	6. Address societal issues
		7. Present their ideas with clarity
		8. Prepare an organized and logical business document
4	Critical Thinking: Ability to identify, analyze business problems and propose effective solutions	9. Use technology for effective communication
		10. Identify main issues of business problems
		11. Examine information from different sources
		12. Draw inferences from analysis
5	Leadership: Ability to take initiative, inspire and collaborate with others	13. Evaluate alternatives
		14. Summarise and conclude
		15. Take initiative
		16. Contribute effectively in groups

PLO-PCG Assessments Mapping Matrix

Program Learning Objectives (PLOs)	Program Competency Goals (PCGs)	Course Assessment Item
This course helps you to develop the following Program Learning Outcomes:	This course helps you to develop the following Program Competency Goals:	This learning outcome will be assessed in the following items
PLO1, PLO2	PCG1	A1, A2, A3
PLO3, PLO4, PLO5, PLO6	PCG2	A4, A5

PLO7, PL8, PLO9	PCG3	A2, A4
PLO10, PLO11, PLO12, PLO13, PLO14	PCG4	A2, A3, A5
PLO15, PLO16	PCG5	A4, A2

Evaluation Schema

The course grade will be determined based on:

Assessment Task	Weightage (Percentage)	Nature (Individual/Group)	Week of Assessment	PLOs to be Assessed
A1: Class Participation	10%	Individual	Continuous	PLO1, PLO2
A2: Case Analysis	20%	Individual	7	PLO7, PLO10, PLO11
A3: Simulation Exercise	20%	Individual	8	PLO12, PLO13
A4: Industry Visit Reflection	20%	Individual	13	PLO3, PLO6
A5 Endterm Examination	30%	Individual	In the JGU Examination period/week	PLO1-PLO14

Description of Assessments:

A1-Class Participation (10%): is individual and provides an opportunity to showcase your creative abilities. The general guidelines are as follows: Read all required readings and participate in classwork as actively and constructively as possible. We will grade each student's classwork using a score sheet for activities completed during 12 sessions. The instructor will evaluate your participation by applying the following two criteria:

1. Was there evidence that the student's participation in the discussion was based on his or her knowledge of the required readings?
2. Was the student's discussion appropriate and to the point? Did the student contribute to class learning? (e.g., by asking thoughtful questions, helping to understand complicated ideas or concepts, offering constructive criticism of another's ideas, suggesting reasonable alternatives, being willing to try out new ideas, pursuing the logic advanced by others, etc.)?

A2-Case analysis (20%): is a structured approach to examining a real or hypothetical situation in order to understand underlying issues, evaluate possible solutions, and make informed decisions. It involves identifying key facts, stakeholders, and challenges, then applying relevant theories, frameworks, or methods to interpret the situation. Effective case analysis requires critical thinking, attention to detail, and the ability to connect evidence with logical reasoning. It is widely used in business, law, education, and healthcare to develop problem-solving skills. By exploring multiple perspectives and potential outcomes, case analysis helps individuals and organizations choose strategies that are practical, ethical, and effective.

A3-Simulation Exercise (20%)-A simulation exercise is a structured activity that replicates real-world scenarios in a controlled environment, allowing participants to practice skills, test decisions, and explore outcomes without real-life risks. It is widely used in fields such as business, healthcare, aviation, and education to enhance learning through experience. Participants engage in realistic situations, often guided by specific objectives, rules, and feedback mechanisms. Simulation exercises promote critical thinking, teamwork, and problem-solving by encouraging active participation and reflection. By mimicking complex situations, they help individuals build confidence, improve performance, and prepare effectively for challenges they may encounter in actual professional or practical settings.

A4- Industry Visit Reflection (20%)- An industry visit reflection is a thoughtful summary and evaluation of insights gained during a visit to a professional workplace or organization. It involves observing operations, understanding real-world applications of academic concepts, and analyzing workplace practices. Through reflection, individuals connect theoretical knowledge with practical experiences, identifying key learnings, challenges, and innovations observed during the visit. This process encourages critical thinking and self-assessment, helping learners recognize how industries function and what skills are required for success. By documenting observations and personal impressions, an industry visit reflection enhances learning, broadens perspectives, and supports career awareness and professional development.

A5 End term examination (30%)- The end term examination will be of **30 marks of 1.5 hours duration**. This will be an invigilated exam in accordance with the mode, modalities, and process as decided by CoE.

Rubrics for Assessments

Case Analysis & Industry Visit Reflection

Criteria	Exceeds Expectations	Meets Expectations	Below Expectations
Content	The assignment demonstrates exceptional knowledge and understanding of the subject matter. The content is thorough, well-organized, and insightful.	The assignment demonstrates a good understanding of the subject matter. The content is well-organized and presents relevant information.	The assignment demonstrates limited understanding of the subject matter. The content is disorganized and presents incomplete or inaccurate information.
Analysis	The assignment provides insightful and original analysis of the topic, using relevant examples and evidence to support arguments.	The assignment provides a good analysis of the topic, using some examples and evidence to support arguments.	The assignment provides limited or no analysis of the topic, with little or no use of examples or evidence.
Presentation	The assignment is well-presented, with clear and concise writing, appropriate use of visuals, and effective use of referencing and citation.	The assignment is adequately presented, with clear writing, appropriate use of visuals, and adequate referencing and citation.	The assignment is poorly presented, with unclear writing, inadequate use of visuals, and insufficient referencing and citation.

Research	The assignment demonstrates extensive research, using a variety of high-quality sources to support arguments.	The assignment demonstrates some research, using a mix of sources to support arguments.	The assignment demonstrates limited research, using few or unreliable sources to support arguments.
Overall	The assignment exceeds expectations in all areas and demonstrates exceptional work.	The assignment meets expectations in most areas and demonstrates good work.	The assignment falls short of expectations in most areas and demonstrates inadequate work.

Presentation:

Criteria	Exceeds Expectations	Meets Expectations	Below Expectations
Content	The presentation demonstrates exceptional knowledge and understanding of the subject matter. The content is thorough, well-organized, and insightful.	The presentation demonstrates a good understanding of the subject matter. The content is well-organized and presents relevant information.	The presentation demonstrates limited understanding of the subject matter. The content is disorganized and presents incomplete or inaccurate information.
Delivery	The presentation is engaging and dynamic, with clear and confident delivery, appropriate use of body language, and effective use of visual aids.	The presentation is engaging, with clear delivery, appropriate use of body language, and adequate use of visual aids.	The presentation is dull or unengaging, with unclear delivery, inappropriate use of body language, and insufficient use of visual aids.
Time Management	The presentation is well-timed and covers all relevant topics within the allotted time.	The presentation is adequately timed and covers most relevant topics within the allotted time.	The presentation is poorly timed and fails to cover relevant topics within the allotted time.
Interaction	The presentation encourages interaction and engagement with the audience, using appropriate questioning and responding effectively to audience feedback.	The presentation attempts to engage the audience, but with limited success in encouraging interaction or responding to audience feedback.	The presentation does not attempt to engage the audience or respond to audience feedback.
Overall	The presentation exceeds expectations in all areas and demonstrates exceptional work.	The presentation meets expectations in most areas and demonstrates good work.	The presentation falls short of expectations in most areas and demonstrates inadequate work.

Teaching Method

The course uses a mix of lectures, storytelling, experiential exercises, and case studies. Here, the onus for learning will be on the student, and the instructor will serve as a facilitator. The instructor facilitates learning through inductive and deductive approaches, encouraging students to analyse

real-world phenomena, evaluate good and bad practices, and apply frameworks to practical contexts. The key to learning this way is to see many examples and situations, and to learn inductively as well as deductively from students and managers' different experiences.

Textbook / Other Readings

Core Textbook: Gwynne Richards, *Warehouse Management: The Definitive Guide to Improving Efficiency and Minimising Costs* (Kogan Page, 5th edition, 2025).

Supplementary Readings: Selected journal articles (3–5 pages each) from Emerald, MDPI, IEEE, and IJLM.

Case Studies:

1. DHL Supply Chain: Managing Growth and Innovation (2012)
2. Amazon.com: Supply Chain Management (2018)
3. Ocado (2015, revised 2016)
4. Kiva the Disrupter (2012)
5. Flipkart: Transitioning to a Marketplace Model (2018)
6. Alibaba Cainiao's Smart Green Logistics Strategy (2021)
7. Zara: IT for Fast Fashion (2004)
8. Digitalisation at Siemens (2017, revised 2021)
9. JD.com: Building the Smart Logistic System for the Future (2017)
10. Walmart's Workforce of the Future (2019)

Session Plan

Session Details	Topics	PLOs Covered
Session 1	Evolution of Warehousing	PLO1, PLO3
Objective of the session	Understand the evolution of warehousing as a strategic hub.	
Subtopics to be covered	Historical development, strategic role, global benchmarks.	
Readings	Richards Ch. 1 (pp.1–22); Emerald article <i>The Changing Role of Warehousing</i> .	
Case Title & Number	<i>DHL Supply Chain: Managing Growth and Innovation</i> (HBS, 2012).	
Pedagogy	Lecture + benchmarking exercise.	
Session 2	Warehouse Technology Architecture	PLO1, PLO2
Objective of the session	Assess warehouse technology architecture for scalability.	
Subtopics to be covered	Infrastructure layers, IT integration, interoperability	
Readings	Richards Ch. 2 (pp.23–45); IJLM article <i>Technology Architecture for Modern Warehouses</i> .	
Case Title & Number	<i>Amazon.com: Supply Chain Management</i> (HBS, 2018).	
Pedagogy	Case analysis + systems mapping	
Session 3	Material Handling Automation	PLO10–PLO13
Objective of the session	Evaluate automation in material handling.	
Subtopics to be covered	AS/RS, conveyors, drones, ROI analysis	

Readings	Richards Ch. 5 (pp.101–130); IEEE article <i>Automation in Material Handling</i> .	
Case Title & Number	<i>Ocado</i> (HBS, 2015, revised 2016).	
Pedagogy	Lecture + quantitative ROI modelling.	
Session 4	Autonomous Mobile Robots (AMRs)	PLO1, PLO2
Objective of the session	Analyse the deployment of AMRs in warehouses.	
Subtopics to be covered	Navigation algorithms, fleet optimisation, cost trade-offs.	
Readings	Richards Ch. 9 (pp.201–220); IJPR article <i>Autonomous Mobile Robots in Warehousing</i> .	
Case Title & Number	<i>Kiva the Disrupter</i> (HBS, 2012).	
Pedagogy	Case study + simulation modelling.	
Session 5	Automated Guided Vehicles (AGVs)	PLO1, PLO2
Objective of the session	Evaluate AGVs in logistics operations.	
Subtopics to be covered	Path planning, safety, integration with WMS.	
Readings	Richards Ch. 9 (pp.221–240); IJLM article <i>AGVs in Logistics Operations</i> .	
Case Title & Number	<i>Maersk: Digital Transformation in Logistics</i> (HBS, 2014).	
Pedagogy	Lecture + scenario analysis	
Session 6	Robotic Picking Systems	PLO10–PLO13
Objective of the session	Assess robotic picking in e-commerce.	
Subtopics to be covered	AI vision, throughput, error reduction.	
Readings	Richards Ch. 7 (pp.150–175); IJLM article <i>Robotic Picking in E-commerce</i> .	
Case Title & Number	<i>Flipkart: Transitioning to a Marketplace Model</i> (HBS, 2018).	
Pedagogy	Case study + role play simulation.	
Session 7	IoT in Warehouses	PLO1, PLO2
Objective of the session	Apply IoT for real-time visibility.	
Subtopics to be covered	RFID, sensors, predictive analytics.	
Readings	Richards Ch. 8 (pp.176–200); MDPI Sensors article <i>IoT Applications in Warehousing</i> .	
Case Title & Number	<i>Alibaba Cainiao's Smart Green Logistics Strategy</i> (HBS, 2021).	
Pedagogy	Lecture + IoT dashboard design activity.	
Session 8	Guest Session- VP SMS Demag, India / DGM, Jindal India.	PLO10–PLO13
Objective of the session	Use AI for inventory optimisation.	
Subtopics to be covered	Forecasting, machine learning, risk reduction.	
Readings	Richards Ch. 4 (pp.70–100); IJPE article <i>AI-Driven Inventory Optimisation</i> .	
Case Title & Number	<i>Zara: IT for Fast Fashion</i> (HBS, 2004).	
Pedagogy	Case study + ethics debate.	
Session 9	Digital Twins & Simulation	PLO10–PLO13

Objective of the session	Evaluate digital twins in logistics.	
Subtopics to be covered	Virtual modelling, scenario planning, resilience testing.	
Readings	Richards Ch. 10 (pp.241–265); IJLM article <i>Digital Twins in Logistics</i> .	
Case Title & Number	<i>Digitalisation at Siemens</i> (HBS, 2017, revised 2021).	
Pedagogy	Simulation exercise + reflection.	
Session 10		
Session 10	Drone-based Inventory Monitoring	PLO1, PLO2
Objective of the session	Assess drone applications in warehousing.	
Subtopics to be covered	Drone tech, regulatory issues, scalability.	
Readings	Richards Ch. 11 (pp.266–285); IEEE article <i>Drone Applications in Warehousing</i> .	
Case Title & Number	<i>JD.com: Building the Smart Logistic System for the Future</i> (HBS, 2017)	
Pedagogy	Video case + policy debate.	
Session 11		
Session 11	Autonomous Fulfillment Centers	PLO10–PLO13
Objective of the session	Analyse autonomous fulfilment centres.	
Subtopics to be covered	Dark stores, micro-fulfilment, automation economics.	
Readings	Richards Ch. 12 (pp.286–310); IJLM article <i>Autonomous Fulfillment Centers</i> .	
Case Title & Number	<i>Ocado</i> (HBS, 2015, revised 2016).	
Pedagogy	Case study + group project.	
Session 12		
Session 12	Workforce Transformation & Ethics	PLO4–PLO6
Objective of the session	Critically assess workforce transformation and ethics.	
Subtopics to be covered	Human-robot collaboration, ethics, safety, reskilling.	
Readings	Richards Ch. 13 (pp.311–335); IJLM article <i>Ethics of Automation in Warehousing</i> .	
Case Title & Number	<i>Walmart's Workforce of the Future</i> (HBS, 2019).	
Pedagogy	Lecture + structured debate.	
Session 13		
Session 13	Industry Visit – Sonipat Logistics Cluster	PLO3, PLO6
Objective of the session	Conduct an industry immersion to observe real-world warehouse operations.	
Subtopics to be covered	Facility layout, automation systems, cold chain practices, and workforce interaction.	
Readings	Reflection journal guidelines (provided by instructor).	
Case Title & Number	Applied observation (Yakult Danone India / Dawat; Sonipat cluster).	
Pedagogy	Field visit + experiential learning; students prepare reflection journals linking practice to theory.	
Session 14		
Session 14	Reading & Revision Week/ Examination Week*	
Objective of the session	NA	
Subtopics to be covered	NA	
Readings	NA	
Case Title & Number	NA	

Pedagogy	NA
Session 15	Reading & Revision Week/ Examination Week*
Objective of the session	NA
Subtopics to be covered	NA
Readings	NA
Case Title & Number	NA
Pedagogy	NA

*Elective Endterm Examinations may take place in the last week of classes.

Disability Support

JGU endeavours to make all its courses accessible to students. The Disability Support Committee (DSC) has identified conditions that could hinder a student's overall wellbeing. These include physical and mobility-related difficulties, visual impairment, hearing impairment, mental health conditions, and intellectual/learning difficulties, e.g., dyslexia and dyscalculia. Students with any known disability needing academic and other support are required to register with the Disability Support Committee (DSC) by following the procedure specified at <https://jgu.edu.in/disability-support-committee/>

Students who need support may register any time during the semester up until a month before the end semester exam begins. Those students who wish to continue receiving support from the previous semester, must re-register within the first month of a semester. Last-minute registrations and support might not be possible as sufficient time is required to make the arrangements for support.

The DSC maintains strict confidentiality about the identity of the student and the nature of their disability and the same is requested from faculty members and staff as well. The DSC takes a strong stance against in-class and out-of-class references made about a student's disability without their consent and disrespectful comments referring to a student's disability.

All general queries are to be addressed to disabilitysupportcommittee@jgu.edu.in

Disclaimer: This course outline including assessments, mode, nature and weightage of assessments, sessions, sequence of sessions and/or readings may be revised during the semester if such need arises.