SPARC-UKIERI Course on Semiconductor Supply Chain Network Design
07-14 August 2025

Overview

The semiconductor industry is highly capital-intensive due to the complex nature of its manufacturing processes and supply chain. Nowadays, semiconductor Industries are facing a competitive business environment due to globalization, shorter product life cycles, minimum cost and lead time, new technologies, and disruption. This course will focus specifically on key steps to achieve efficient management and analysis of Semiconductor Supply Chain Network Design. Each lecture will be devoted to a specific section containing theoretical and practical aspects, related tools and techniques, case studies, group work, plenary discussion, and problem-solving activities. During this course, the participants would get a chance to leverage the knowledge of eminent faculties from around the globe in the field of supply chain management which will help them gain a practical insight into the problems which are plaguing various semiconductor industries.

Program Details

Modules	15 hours lecture and 5 hours lab
Target Participants	IIT Kharagpur UG 4th Year, PG, PhD, students interested in supply chain and industrial engineering
Course Fees	There are no fees. Due to limited seats the selection is on a first-come, first served basis.
Venue	Department of ISE, IIT Kharagpur
Registration	https://erp.iitkgp.ac.in/CEP/courses.htm
Contact	**Dr. Sri Krishna Kumar (**convenor) **Dr. Akhilesh Kumar (**Co-Convenor) Department of ISE, IIT Khaargapur Tel: 03222-283744, 283732 (office); E-mail: srikrishna@iem.iitkgp.ac.in; akumar@iem.iitkgp.ac.in

Course Contents

Topic	Contents	# of hours
Introduction	Fundamentals of Semiconductor Supply Chain, Semiconductor Manufacturing Process	1.5
Demand Planning	The Demand Planning activities related to the Sales function on the mid and short-term levels	1.5
Strategic Network Design	Integration, Outsourcing, coordination, Facility Location	3
Supply Chain Strategies	Make to Order, Make to Stock, Procurement, Production	3
Capacity Planning	Master Planning, Resource allocation	1.5
Inventory Management	Safety Stock, Stochastic inventory models	1.5
Production Planning and Scheduling	Setup time, lead time, Scheduling, WIP	1.5
Lot Sizing	Cycle time, yield	1.5

Lab component

Experiment	Brief Description	# of hours
Optimization in Semiconductor Manufacturing	Linear and Integer programming problems in semiconductor manufacturing	2.5
Semiconductor Supply Chain Simulation	Discrete Event Simulation in semiconductor manufacturing	2.5

The Faculty

Prof. Alok Choudhary is the Head of the Supply Chain Group at WMG, University of Warwick, and Founding Director of the JLR-WMG Supply Chain Innovation Hub. A sought-after supply chain thought leader and keynote speaker, his industry-driven research on sustainability, resilience, and digital transformation drives impact across industry, policymakers, and society. Alok has led large-scale, multi-stakeholder projects with funding exceeding £25 million by UKRI, EU and industries including JLR, Siemens and DHL.

Dr. Sri Krishna Kumar is an Associate Professor in the in the Department of Industrial & Systems Engineering at the Indian Institute of Technology, Kharagpur. His expertise includes, Supply Chain Management, Port Logistics, Knowledge Management, Game Theory and Optimization and published good articles in the journal like IJPR, CAIE, ANOR, and JEM.

Dr. Akhilesh Kumar is currently working as an Associate Professor in the Department of Industrial & Systems Engineering at the Indian Institute of Technology, Kharagpur. His publications appeared in such journals as the International Journal of Production Economics, European Journal of Operational Research, Expert System with Applications, and IEEE. He has carried out various research and consultancy projects with Shell, Tata Sons, Govt. of India, European Union. Dr. Kumar is the recipient of the Faculty Excellence Award 2020.