



# TOYOTA PRODUCTION SYSTEM

## PROF. RAJAT AGRAWAL

Department of Management  
IIT Roorkee

**PRE-REQUISITES :** Production and Operations Management

### INTENDED AUDIENCE :

1. Industry people who wants to use “operations” for competitive advantage.
2. Students doing research in operations management.
3. Students doing Masters and Bachelors degrees in area of operations management, industrial engineering etc.
4. Professionals who are interested in knowing the best practices in operations.

**INDUSTRIES APPLICABLE TO :** This course will be highly useful for manufacturing organizations. Particularly companies such as Hero, Maruti, BHEL, Rockman, Bajaj, Tata etc. will find this course valuable

### COURSE OUTLINE :

Manufacturing is one of the important activity for wealth generation. Countries like China, Thailand, Vietnam etc are creating an enabling environment for developing these nations as major industrial ones. Therefore, there is an increasing interest in manufacturing activities. Toyota car company at Japan is a very interesting case study to learn many things to make manufacturing competitive. Toyota consistently raises the bar for manufacturing, product development, and process excellence. The result is an amazing business success story: steadily taking market share from price cutting competitors, earning far more profit than any other automaker, and winning the praise of business leaders worldwide. The proposed course will discuss various aspects of Toyota’s approach and will also focus to achieve sustainability through excellence in operations.

### ABOUT INSTRUCTOR :

Prof. Rajat Agrawal is a Professor at Department of Management Studies, Indian Institute of Technology Roorkee, Roorkee. He is Associate Dean for Innovation and Incubation, IPR Chair Professor of DPIIT, Govt of India at IIT Roorkee. He is a joint Faculty member at Department of Design, IIT Roorkee.

He is a recipient of Ram Kumar Award for Teaching and Research at IIT Roorkee. He conceptualized and initiated a two year full time Masters in Innovation Management at IIT Roorkee. He has some very popular MOOCs at NPTEL which are regularly rerunning and also having courses on different Edtech platforms.

He is Associate faculty member at Center of Excellence for Disaster Mitigation and Management and at Center of Excellence for Transportation Management, IIT Roorkee. He initiated the process of establishing the Design Innovation Centre at IIT Roorkee and presently Co-PI and Co-coordinator of the Centre. Dr. Rajat was a visiting fellow to Copenhagen Business School, Copenhagen, Denmark. He was awarded ICCR Chair at Indonesia in year 2016-17. His area of interest is Production and Operations Management including Supply Chain Management, Manufacturing Strategy and World Class Manufacturing.

He has guided 19 Ph D thesis in these areas and currently 12 students are working under his guidance. He has completed 12 research/consultancy projects of National and International importance. Three projects worth over Rs2.5 Cr are in progress.He has more than 120 research papers in refereed journals and more than 25 research papers in refereed conference proceedings. He has authored one book published by Bloomsbury and book chapters in 8 books. He organized First PANIIT International Management Conference in year 2018.

## **COURSE PLAN:**

- Week 1:** (1) Manufacturing Excellence  
(2) Global Environment  
(3) Production System  
(4) Operations Strategy  
(5) The Heart of the TPS: Eliminating Waste
- Week 2:** (1) Principles of Toyota Way  
(2) Culture Behind Toyota Way  
(3) Toyota Way in Action  
(4) Long Term Philosophy  
(5) Create Continuous Flow
- Week 3:** (1) Pull System  
(2) Leveling Workload  
(3) Get Quality Right the first time  
(4) Standardization of Task  
(5) Use of Visual Control
- Week 4:** (1) Use of Reliable Technology  
(2) Role of Leaders in Manufacturing Philosophy  
(3) Developing Exceptional Teams  
(4) Challenge & Respect Extended Networks  
(5) See yourself to understand the situation
- Week 5:** (1) Developing decisions with Consensus  
(2) Becoming Learning Organization  
(3) Becoming a Learning Organization: Continuous Improvement  
(4) Using Toyota Way for other Organization(Service & Technical)  
(5) Lean Manufacturing
- Week 6:** (1) Lean Vs Agile Manufacturing  
(2) Sustainable Manufacturing-I  
(3) Sustainable Manufacturing-II  
(4) Flexible Manufacturing System  
(5) Benchmarking
- Week 7:** (1) Cultural Issues in Lean  
(2) Overview of Lean implementation  
(3) Significance of Lead time  
(4) Techniques to reduce LT  
(5) Value Stream Mapping
- Week 8:** (1) KANBAN Approach  
(2) KANBAN Calculation-I  
(3) KANBAN Calculation-II  
(4) Theory of Constraints  
(5) Different Business Excellence Models