BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI- HYDERABAD CAMPUS

**FIRST SEMESTER 2022-2023**

**Course Handout (Part II)**

Date: 20/08/2022

In addition to Part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

**Course No. :** ME G538

# Course Name : TOYOTA PRODUCTION SYSTEM

# Instructor-in-charge : AMIT KUMAR GUPTA

# Lecture schedule : Tue, Thu, Sat – 4 (11 AM – 12 PM) @ G107

# Lab Instructor : VardhanapuMuralidhar

# Lab schedule : Thu – 9-10, Fri – 7-8

1. Course Description:

Birth of Toyota production system, house of Toyota productionsystem, stability, standardization, just-in-time,jidoka, involvement,hoshin planning, Toyota culture, Toyota way, Case Studies.

2. Scope:

In factories around the globe, 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 wining the praise of business leaders worldwide. With a market capitalization greater than the value of General Motors, Ford and Chrysler combined; Toyota is the world’s most profitable automaker. Toyota’s well known “secret weapon” is lean manufacturing – the revolutionary approach to business processes that it invented in the 1950’s and has spent decades for perfecting. Today business around the world is attempting to implement Toyota system to maintain competitive advantage. But are they?

The course explains Toyota’s unique approach to Lean manufacturing, that drive Toyota’s quality and efficiency obsessed culture. You will valuable insights that can be applied to any organization and any business process, whether in services or manufacturing. You will discover how the right combination of long term philosophy, processes, people and problem solving can transform your organization into a lean, learning enterprise – the Toyota way.

3. Objective:

* Opportunity to see Toyota at close
* To provide a clear and simple guide to lean manufacturing / Toyota production system
* Provides a great way to begin learning and opportunity for you to start your own journey (The Toyota Way)
* At the end of this course, the students will be able to understand the importance of lean manufacturing / The Toyota Way as a strategic weapon
* At the end of this course, the student will be able to understand the World –Class power of the Toyota way

3. Text Books:

T1. Pascal Dennis, "Lean Production Simplified", 2ndEdition, Productivity Press, 2007.

T2. Jeffrey K. Liker, “The Toyota Way”, McGraw-Hill Edition, New Delhi, 2004.

4. Reference Books*:*

R1. Masaaki Imai, “Gemba Kaizen: A Commonsense, Low-Cost Approach to Management”, MaGraw-Hill, 1997.

R2. James P. Womack and Daniel T. Jones, “Lean Thinking: Banish Waste & Create Wealth in Your Corporation, Revised Edition, Simon & Shuster, 2001.

R3. Mike Rother, “Learning to See: Value Stream Mapping to Create Value & Eliminate MUDA”, Lean Enterprise Institute, 2003.

R4. Jeffrey K Liker and Divid Meier, “The Toyota Way Field Book: A Practical Guide for Implementing Toyota’s 4Ps”, Tata MaGraw-Hill Edition, 2006.

R5. John Allen, Charles Robinson and David Stewart, “Lean Manufacturing: A Plant Floor Guide”, Society of Manufacturing Engineers, Michigan, 2001.

R6. Mike Rother, “Toyota Kata: Managing People for Improvement, Adaptiveness, and Superior Results”, Tata MaGraw-Hill Edition, 2010.

5. Course Plan:

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| Lecture  No. | Learning Objectives | Topics to be covered | Reference  Chap./Sec.# (Book) |
| 1-3 | Types of production systems, growing dysfunction, birth of lean production, virtue of necessity, lean revolution at Toyota | Birth of lean production | 1, (T1) |
| 4-5 | Why lean production? Systems andsystems thinking, basic image of leanproduction, customer focus, muda | Lean production system | 2, (T1) |
| 6-8 | Standards in lean system, 5S system, total productive maintenance | Stability | 3, (T1) |
| 9-12 | Lean thinking, why standardized work?Elements of standardized work,Standardized work and kaizen, commonlayouts | Standardized work | 4, (T1) |
| 13-20 | Why JIT, principles of JIT, JIT system,kanban, kanban rules, expanded role ofconveyance, production leveling, threetypes of pull systems, value streammapping | Just-In-Time | 5, (T1) |
| 21-24 | Development of Jidoka concept, whyjidoka, poka-yoke, inspection systemsand zone control, using poka-yokes andimplementing jidoka | Jidoka | 6, (T1) |
| 25-26 | Why involvement? The terrible waste ofhumanity, activities supportinginvolvement, kaizen circle activity,practical kaizen training, suggestionprograms | Involvement | 7, (T1) |
| 27-28 | What is planning? Why plan? Problemswith planning, hoshin planning, hoshinplanning system, four phases of hoshinplanning | Hoshin planning | 8, (T1) |
| 29-30 | What is lean culture? How does leanculture feel? | The culture | 9, (T1) |
| 31 | Operational excellence as a strategicweapon, story of Toyoda family andToyota production system (TPS), heartof the TPS: eliminating waste, 14principles of Toyota way, Toyota way inaction | The world-class power ofthe Toyota way | 1-6, (T2) |
| 32 | Principle 1: Base your managementdecisions on a long-term philosophy,even at the expense of short-termfinancial goals | Long-term philosophy | 7, (T2) |
| 33 | Principle 2: Create continuous processflow to bring problems to the surface  Principle 3: Use “Pull” systems to avoidoverproduction | The right process willproduce the right results | 8-9, (T2) |
| 34 | Principle 4: Level out the workload (Heijunka)  Principle 5: Build a culture of stopping to fix problems, to get quality right the first time | The right process willproduce the right results | 10-11, (T2) |
| 35 | Principle 6:Standardized tasks are the foundation for continuous improvement and employee empowerment  Principle 7: Use visual control so no problems are hidden | The right process willproduce the right results | 12-13, (T2) |
| 36 | Principle 8: Use only reliable,thoroughly tested technology that servesyour people and process  Principle 9: Grow leaders who thoroughly understand the work live the philosophy, and teach it to others | The right process will produce the right results.  Add value to the organization by developing your people and partners | 14-15, (T2) |
| 37-38 | Principle 10: Develop exceptional people and teams who follow your company’s philosophy  Principle 11: Respect your extended network of partners and suppliers by challenging them and helping them improve | Add value to theorganization bydeveloping your peopleand partners | 16-17, (T2) |
| 39-40 | Principle 12: Go and see yourself to thoroughly understand the situation (GenchiGenbutsu)  Principle 13: Make decisions slowly by consensus, thoroughly considering all options; Implement decisions rapidly | Continuously solving root problems drives organizational learning | 18-19, (T2) |
| 41-42 | Principle 14: Become a learning organization through relentless reflection (Hansei) and continuous improvement (kaizen)  Using the Toyota way to transform technical and service organizations, build your own lean learning enterprise, borrowing from the Toyota way | Continuously solving root problems drives organizational learning  Applying the Toyota way in your organization | 20-22, (T2) |

6. Evaluation Scheme:

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| No. | EvaluationComponent | Duration | Weightage | Date& Time | Nature of EC |
| 1. | Mid-Sem. Test | 90 min | 20% | 04/11/2022  3.30 - 5.00PM | CB/OB |
| 2. | Seminars/Assignments/Quizzes | --- | 40 % |  | OB |
| 3. | Compre. Exam. | 180 min | 40% | 28/12/2022 AN | CB/OB |

7. Chamber Consultation Hour: Will be announced by the instructor in the class.

8. Notices: Notices regarding this course will be displayed on the CMS.

9. Make up Policy: Make-up will be granted only to genuine cases with prior permission from the IC. For cases related to illness,proper documentary evidence is essential.

10.Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge

ME G538