MUZAFFARPUR INSTITUTE OF TECHNOLOGY

MUZAFFARPUR

COURSE FILE

OF

COMPETETIVE MANUFACTURING STRATEGY

NARAYAN KUMAR

ASSISTANT PROFESSOR

DEPARTMENT OF MECHANICAL ENGINEERING

विज्ञान एवं प्रावैधिकी विभाग
Department of Science and Technology
Government of Bihar

CONTENT

Department of Mechanical Engineering

Vision

To strengthen the region through imparting superior quality technical education and research; which enables the fulfilment of industrial challenge and establish itself as a Centre of Excellence in the field of Mechanical Engineering.

Mission

• To build an academic environment of teaching and lifelong learning for students to make them competitive in context with advance technological, economical and ecological changes.

• To enable the students to enhance their technical skills and communications through research, innovation and consultancy projects.

• To share and explore the accomplishments through didactic, enlightenment, R & D programs with technical institution in India and abroad.

Program Educational Objectives

- To prepare the students for successful career in industries, entrepreneurship or in higher studies. (Preparation)
- To inculcate engineering attitude to analyze, design and solve real life engineering problems. (Core knowledge)
- To promote the students for continuous learning, with strong professionals, ethical and moral values. (Learning Environment)

Program Specific Outcomes

The graduates of Bachelor of Engineering in Mechanical Engineering Programme will be able to:

- Design and develop mechanical as well as inter disciplinary components by experimental, numerical and analytical techniques
- Apply their knowledge from field of mathematics and science fields to solve problems related to mechanical engineering.

Program Outcomes

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome

On successful completion of this course, students will be able to:

- Understand the competitive environment in the market.
- Understand suitable manufacturing processes to be used for production of different products in order to compete in the competitive market.
- Understand reengineering.
- Select manufacturing systems for different manufacturing scenarios.
- Face competition in the global market.

Mapping of CO's with PO's

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	2	1	3	1	2	-	1	-	2	2
CO2	2	-	3	1	3	1	3	-	-	-	1	3
CO3	1	1	3	3	3	-	3	-	-	-	2	2
CO4	2	-	3	1	3	1	3	-	-	-	1	3
CO5	2	-	2	1	3	1	2	-	1	-	2	2

CO	PSO1	PSO2
CO1	2	1
CO2	3	1
CO3	3	1
CO4	3	1
CO5	1	-

Syllabus

02 1x18 COMPETITIVE MANUFACTURING STRATEGIES

L–T–P: 3–1–0 Credit: 4

1. The competitive environment in the market: The WTO agreement and its effect on Indian Industries, Manufacturing as a competitive strategy, Competitive Advantages and Disadvantages. Lecture: 6

2. Product Variety : Modular Design, Design for manufacturability, Selection of manufacturing Technologies, Vendor Development, Vendor rating, Just in time manufacturing, Kanban system, and Agile Manufacturing. Lecture: 8

3. Reengineering: TQM, MRP, ERP and simulation as tools for competitive manufacturing, Intelligent Manufacturing. Lecture: 8

4. Selection of manufacturing systems for different manufacturing scenarios : Dedicated manufacturing system, Flexible manufacturing system (FMS), cellular manufacturing system (CMS), and Re-configurable manufacturing system (RMS); Elementary of DMS, FMS, CMS, and RMS. Lecture: 14

5. Concept: CIM, FOF, Network based manufacturing, and E-Manufacturing. Lecture: 5

Time Table

	10:00-10:50	10:50-11:40	11:40-12:30	12:30-01:20	01:20-01:50	01:50 - 02:40	02:40-03:30	03:30-04:20
MON		CMS			L U N C H			
TUE								
WED		CMS				CMS (T)		
THRU	CMS					CMS (T)		
FRI								
SAT								

Student List

S. No.	Name	Roll No.
1	ASHISH CHAURASIA	15M01
2	RAJ KAMAL	15M02
3	VIVEK KUMAR	15M03
4	RAM BHADRA JHA	15M04
5	RITU RAJ	15M05
6	SUMIT KUMAR	15M06
7	PAWAN KUMAR PIYUSH	15M07
8	HIMANSHU KUMAR	15M08
9	ANMOL	15M09
10	MADHU PRIYA	15M10
11	SANJAN KUMAR YADAV	15M11
12	PRAVEEN KUMAR	15M12
13	VIKASH KUMAR KESHRI	15M13
14	AHSAN SOHAIL	15M14
15	MUKESH KUMAR ROY	15M15
16	SAJAN KUMAR	15M16
17	SUMAN KUMAR SINHA	15M17
18	RITESH KUMAR	15M18
19	SHANUR RAHMAN WAHID	15M19
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65	PRAKASH KUMAR	15M65
66	ANAND MOHAN DEO	15M66
67	ADITYA KUMAR	15M67
68	ADITYA KUMAR	16(LE)M01
69	SHAKTI KUMAR	16(LE)M02
70	ROHIT KUMAR	16(LE)M03
71	KUMARI PRIYA RANJAN	16(LE)M04
72	KAMLESH KUMAR	16(LE)M05
73	KUMAR PRATIK VISHWAS	16(LE)M06
74	VIKRANT KUMAR	16(LE)M07
75	NIRBHAY KUMAR	16(LE)M08
76	RAUSHAN KUMAR SINGH	16(LE)M09
77	HIMANSHU CHANDRA	16(LE)M10

Lecture Plan

Lecture 1	WTO
Lecture 2	WTO agreements
Lecture 3	Effect of WTO agreements on Indian industries
Lecture 4	Manufacturing as a competitive strategy
Lecture 5	Competitive advantages
Lecture 6	Competitive disadvantages
Lecture 7	Modular Design
Lecture 8	Design for manufacturability
Lecture 9	Selection of manufacturing Technologies
Lecture 10	Vendor Development
Lecture 11	Vendor rating
Lecture 12	Just in time manufacturing
Lecture 13	Kanban system
Lecture 14	Agile Manufacturing
Lecture 15	TQM
Lecture 16	TQM
Lecture 17	MRP
Lecture 18	MRP
Lecture 19	ERP
Lecture 20	ERP
Lecture 21	Simulation as tools for competitive manufacturing
Lecture 22	Intelligent Manufacturing
Lecture 23	Dedicated manufacturing system
Lecture 24	Dedicated manufacturing system
Lecture 25	Dedicated manufacturing system
Lecture 26	Flexible manufacturing system (FMS)
Lecture 27	Flexible manufacturing system (FMS)
Lecture 28	Flexible manufacturing system (FMS)
Lecture 29	Cellular manufacturing system (CMS)
Lecture 30	Cellular manufacturing system (CMS)
Lecture 31	Cellular manufacturing system (CMS)
Lecture 32	Re-configurable manufacturing system (RMS)
Lecture 33	Re-configurable manufacturing system (RMS)

Lecture 34	Re-configurable manufacturing system (RMS)
Lecture 35	Elementary of DMS, FMS, CMS, and RMS
Lecture 36	Elementary of DMS, FMS, CMS, and RMS
Lecture 37	CIM
Lecture 38	FOF
Lecture 39	Network based manufacturing
Lecture 40	E-Manufacturing
Lecture 41	E-Manufacturing

Assignments

Assignment 1

1. Explain WTO and its agreements.
2. What are the effects of WTO agreements on Indian industries?
3. Explain the strategies for competitive advantage.
4. What are the advantages of competition in the market?
5. What are the disadvantages of competition in the market?

Assignment 2

1. What is modular design and what are its advantages?
2. Explain design for manufacturability.
3. How do we select different manufacturing technologies?
4. Explain vendor development and vendor rating?
5. Explain the following terms:

(i) Just in time manufacturing
(ii) Kanban system
(iii) Agile manufacturing

Assignment 3

1. Explain Total Quality Management.
2. What is Materials Requirement Planning (MRP)? What are the inputs and outputs required by the MRP processing logic?
3. Explain Enterprise Resource Planning.
4. Explain simulation as tools for competitive manufacturing.
5. Give a brief of intelligent manufacturing.

Assignment 4

1. What is Dedicated Manufacturing System?
2. What is Flexible Manufacturing System?
3. What is Cellular Manufacturing System?
4. What do you mean by reconfigurability? Discuss Re - configurable Manufacturing System.

Assignment 5

1. Discuss Computer Integrated Manufacturing and its advantages.
2. Explain Network Based Manufacturing?
3. Explain E – Manufacturing?

Tutorial

Tutorial 1

1. Explain agreement on TRIPs.
2. Explain GATS.
3. What are tariff and non- tariff barriers?
4. What are the objectives of manufacturing?
5. What are the three pillars of AoA?

Tutorial 2

1. What are differences between modular and non- modular design?
2. What are the aims of design for manufacturability?
3. Explain the stages of vendor development?
4. Discuss the methods used for vendor rating?
5. What is the difference between traditional manufacturing and JIT manufacturing?
6. Explain the advantages and disadvantages of JIT system.
7. How does the Kanban card works?

Tutorial 3

1. Discuss the key principles of TQM?
2. What is Materials Requirement Planning (MRP)? What are the inputs and outputs required by the MRP processing logic?
3. Discuss some of the advantages and disadvantages of ERP?

Tutorial 4

1-Just-in-Time was successfully implemented by

(A) Toyota

(B) Honda

(C) Suzuki

(D) Volkswagen

2-In Just-In-Time system

(A) There is no delay

(B) Conveyance times are balanced

(C) Both (A) and (B)

(D) There is unequal production at different places

3-In Just-In-Time the vendor is to be viewed by the company as a

(A) Manager

(B) Worker

(C) Partner

(D) None of the above

4-Just-In-Time is

(A) Single unit production

(B) Big lot size production

(C) Both (A) and (B)

(D) None of the above

5-MRP is different from JIT in terms of

(A) Inventory

(B) Quality

(C) Human orientation

(D) All of the above

6-Just-In-Time aimed at

(A) Zero inventories

(B) Reduced manpower

(C) Over production

(D) All of the above

7-Just-In-Time (JIT) combines the benefits of

(A) Job order production and Line production

(B) Batch production and Line production

(C) Job order production and Batch production

(D) None of the above

8-JIT does not believe in

(A) Quality

(B) Over production

(C) Human relations

(D) All of the above

ANSWERS:

1-(A), 2-(C), 3-(C), 4-(A), 5-(A), 6-(A), 7-(A), 8-(B)

Muzaffarpur Institute of Technology

B.Tech 6th semester

Mid Semester examination- April -2018

Subject name & code- Competitive Manufacturing Strategy & (021618)

Time: 2 hours **Full Marks: 20**

Instructions:

i. **All questions carry equal marks (5 marks).**
ii. **There are total six questions.**
iii. **Attempt any four question.**

1. What are the effects of WTO agreements on Indian industries?
2. What is Just -in-time manufacturing? List some of its advantages and disadvantages.
3. Define vendor rating? What are the stages involved in vendor development?
4. What is TQM? Explain its principles.
5. Explain MRP. What are its input and output?
6. Write short notes on any two:

(i) Kanban system
(ii) Agile manufacturing
(iii) ERP
(iv) Modular design

Results

S. No.	Name	Roll No.	Mark
1	ASHISH CHAURASIA	15M01	28
2	RAJ KAMAL	15M02	30
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