

GUJARAT TECHNOLOGICAL UNIVERSITY

MECHANICAL (INDUSTRIAL ENGINEERING) (46) PRODUCTIVITY ENGINEERING & MANAGEMENT SUBJECT CODE: 2744601 M.E. 4TH SEMESTER

Type of course: Major Elective - V

Prerequisite: Nil

Rationale: The aim of this course is to make students aware of various productivity measurement models, their assumptions and silent features. The course will enhance the knowledge of students regarding characteristics, strengths and weaknesses of manufacturing and service sectors in the context of measurement of productivity. The course is also aimed at introducing the concepts of Business Process Reengineering to the students.

Teaching and Examination Scheme:

| Teaching Scheme | | | Credits C | Examination Marks | | | | | | Total Marks |
|-----------------|---|-----|--------------|-------------------|--------|-----------------|----|--------|----|----------------|
| L | T | P | | Theory Marks | | Practical Marks | | | | |
| | | | | ESE (E) | PA (M) | ESE (V) | | PA (I) | | |
| | | ESE | OEP | | | PA | RP | | | |
| 3 | 0 | 2# | 4 | 70 | 30 | 30 | 0 | 10 | 10 | 150 |

Content:

| Sr. No. | Content | Total Hrs | % Weightage |
|----------|--|-----------|-------------|
| 1 | Introduction: Productivity basic concepts: Partial, Total Factor productivity, Types of productivity measure: Single, Multi-factor, productivity cycle, Productivity: Some perspectives. | 3 | 8 |
| 2 | Productivity Models: Kendrick-creamer model, Craig-Harris model, American productivity center model, Productivity accounting model. | 4 | 8 |
| 3 | Productivity Measurement Models: Models of productivity measurement: Production function models, Financial ratios, Production based models, Product oriented models, Surrogate models, Economic based model, Models based on systems approach, Productivity measurement at International, National and Organizational level, total productivity models, Productivity management in manufacturing and service sector, Productivity Evaluation models, Productivity improvement models and techniques. | 10 | 20 |
| 4 | Productivity Measurement: A Conceptual framework: MBO and Productivity measurement, Key Performance Area in MBO, Performance Objectives-Productivity (PO-P) Model, its methodology, KPA's, Productivity indices. | 5 | 10 |
| 5 | Productivity Measurement in Manufacturing Sector: Productivity Measurement in Small Size, Medium Size and in Large | 5 | 10 |

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|-----------|--|---|----|
| | Size Organization considering KPA's, performance objectives and productivity indices calculations for these case to be studied. | | |
| 6 | PO-P application: Productivity Measurement in Service Sector: Need for measuring productivity in service sector, Productivity of an R & D System & Educational institution, methodology. | 3 | 8 |
| 7 | Productivity Management and Implementation Strategies: Productivity policy, Productivity measurement evaluation, Productivity improvement strategies: Organizational, Human and Technological. | 3 | 8 |
| 8 | Introduction to Business Process reengineering: Basics of BPR, Need for reengineering, Benefits of BPR, Breakthrough reengineering model, BPR guiding principles, Key target of BPR, BPR in manufacturing industries. | 5 | 10 |
| 9 | BPR Implementation Methodology: BPR methodology, different phases of BPR, BPR methodology selection guidelines, different BPR methodologies and its comparison, BPR success factors, Barriers to BPR, BPR and relevant technologies. | 5 | 10 |
| 10 | Green Productivity: Green productivity and ways to measure green productivity, Feedback tools and system, Integrated Management of Productivity Activities (IMPACT Model), Productivity Indicators, Integrated Approach to Productivity Measurement. | 2 | 8 |

Reference Books:

1. Prem Vrat, Sardana, G. D. and Sahay, B. S, Productivity Management - A Systems Approach, Narosa Publishing House, New Delhi, 1998.
2. R. Radhakrishnan, S. Balasubramanian, Business Process Reengineering: Text and Cases, PHI Learning Private Limited, New Delhi, 2011.
3. Sumanth, David J., Productivity Engineering and Management, Tata McGraw Hill, New Delhi, 1990.
4. Rastogi, P. N. Re-Engineering and Re-inventing the Enterprise, Wheeler pub. New Delhi, 1995.
5. A Measurement Guide to Green Productivity - 50 Powerful Tools to Grow your Triple Bottom Line, Asian Productivity Organization (APO), Tokyo, 2003.
6. Productivity Measurement in the Service Sector, Asian Productivity Organization (APO), Tokyo, 2001.
7. Productivity Measurement in the Retail And Food Industry, Asian Productivity Organization (APO), Tokyo, 2012.
8. Measuring Productivity, OECD Manual, Measurement of Aggregate and Industry Level Productivity Growth, www.sourceOECD.org
9. A Guide to Productivity Measurement, SPRING Singapore, 2011

Course Outcome:

After learning the course the students should be able to:

1. Understand the dynamics of productivity measurement in manufacturing and service sectors.
2. Understand different productivity measurement models.
3. Understand the salient characteristics and limitations of different productivity measurement models.
4. Understand the differences among small, medium and large manufacturing enterprises as well as service sectors in the context of productivity measurement.
5. Understand the concept of Business Process Reengineering.

List of Tutorials:

1. Introduction to Productivity and its cases
2. Productivity improvement case study
3. BPR applications in Manufacturing Sector - case study
4. BPR applications in Service Sector - case study
5. BPR and its implementations

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.