UNIVERSITY POLYTECHNIC
B.I.T., MESRA, RANCHI

Syllabus of Diploma in Engineering (Manufacturing Engineering) (Semester VI)

COURSE STRUCTURE
(W.E.F. 2011 Batch Students)
(Total Unit 7.0)

Course Code	Theory	Unit	Course Code	Sessional	Unit
DME 6001	Technology of CAD/CAM	1.0	DME 6002	CAD/CAM Lab.	0.5
DME 6003	Modern Manufacturing Process	1.0	DME 6010	NCMP Lab.	0.5
DME 6005	Quality Control	1.0	DME 6012	Project	1.0
DME 6007	Elective Paper Operational Research	1.0			**2.0**
MBA 6003	Total Quality Management	1.0		Seminar/Industrial Visit (Non-Credit)	0.5
		5.0			

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SUBJECT : Technology of CAD/CAM **COURSE CODE : DME 6001**

Module 1
Introduction to CAD/CAM **:** Basic concepts, Benefits and application of CAD/CAM. 3

Module 2
Computer Graphics **:** Two and three dimensional transformations, clipping and windowing, segmentations. 5

Module 3
Geometrical Modelling **:** Wire frame modelling, surface modelling, solid modelling and their applications, introduction, use & application of drafting package. 5

Module 4
Numerical Control Machines : Classification and structure of NC system, NC coordinate system, absolute and incremental positioning. Fixed and floating zero points. 4

Module 5
CNC & DNC Machines **:** Concept, need and structure of CNC & DNC machines. Adaptive control, part programming and related language. 8

Module 6
Robotics **:** Basic elements, physical configuration work volume & basic robotic motions. End effectors – grippers tools, Robot applications. 10

Module 7
FMS **:** Concept, need, structure & operation of flexible manufacturing systems. 5

Books :

1. Introduction to CAD/CAM – Groover & Zimmers
2. CAD/CAM Principle & Application – P. N. Rao
3. CAD/CAM Theory & Practice – Ibrahim Zied

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Subject : Modern Manufacturing Process **Course code : DME 6003**

Module 1
Introduction to modern manufacturing processes, Fundamental Principles, Application possibilities & process parameters. 8

Module 2
Schematic Layout of Machine and operational Characteristics of Abrasive Jet Machining, water jet machining 6

Module 3
Fundamental principles and operational characteristics of ultrasonic machining and ultrasonic welding. 6

Module 4
Fundamental principles, process parameters and applications of electrical discharge machining 6

Module 5
Fundamental principles, process parameters and applications of chemical machining, electro chemical machining and electrochemical grinding. 8

Module 6
Principles & applications of LASER beam , electron beam machining. 3

Module 7
Principles & applications of plasma arc machining and welding. 3

Text-Books:
1. New Technology by Amitava Bhattacharya (IEI)
2. Non Conventional Manufacturing by V K Jain.
3. Production Technology by R. K. Jain

Reference-Books:
1. Non Conventional manufacturing by P K Mishra
2. Manufacturing Science by Amitabh Ghosh

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Subject : Quality Control **Course code : DME 6005**

Module 1
Concept of Quality**:** Definition of quality, cost of quality , value of quality. Quality control, objectives of quality control, quality control and inspection. 5

Module 2
Statistical concepts **:** Definition of probability, laws of probability. Normal, Binomial & Poisson probability distributions. Statistical Quality Control. 6

Module 3
Control Charts for Variables **:** Introduction, objectives , theories of control charts for averages , ranges, standard deviations. Process capability study. 5

Module 4
Control Charts for Attributes **:** Fraction defectives and number of defects. Interpretation of control charts. 5

Module 5
Acceptance Sampling by attributes **:** Concepts of acceptance sampling , advantages and limitations , sampling methods , single, double and- multiple sampling plants .operating characteristic curves . 7

Module 6
Total Quality Management **:** Concept of Total Quality management, Principle objectives of TQM. 6

Module 7
ISO 9000 Quality System **:** History of ISO: 9000, ISO:9000 series in general, benefits by becoming an ISO:9000 company, steps to registration, India and ISO:9000. 6

BOOKS:

1. Statistical Quality Control by M.Mahahjan
2. Quality Planning and Analysis by J.M .Juran & Frank M Gryna
3. Statistical Quality Control by Eugune L.Grant & Richard S Leaven worth
4. Total Quality Management by John M Kelly
5. TQM by R.P. Mohanty & R.R. Lakhe.

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Subject - Operations Research **Course Code : DME 6007**

Module 1
Linear Programming : Scope and Limitation of O.R, Mathematical formulation of the problem, graphic solution. The Simplex method. 10

Module 2
Duality in Linear Programming **:** Concept of Duality, Dual Simplex method. 8

Module 3
Transportation Model : Basic feasible solution of balanced transportation problems by different methods. 6

Module 4
Assignment Model : Balanced assignment problems. 4

Module 5
Sequencing : Processing n jobs through two machines, processing n jobs through three machines. 5

Module 6
Queuing Model : The M/M/1/FIFO queuing systems 4

Module 7
PERT/CPM : Basic concepts 3

Books :

1. Operations Research : P. K. Gupta & D. S. Hira
2. Operations Research : K. Swaroop
3. Operations Research : Taha

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Subject : Total Quality Management **Course code : MBA 6003**

Module 1
Introduction : Concept of Total Quality Management, Objective of TQM, Scope of TQM, Components of TQM, Evolution of TQM, Definition of Quality and its important. (4)

Module 2
Components of Total Quality Management : Customer Supplier Relationship in TQM System, Management, Leaders in TQM System, Managerial Role in TQM. (6)

Module 3
Practices for TQM : TQM and Human Resource Development, Need and Significance of TQM, Process of TQM. (6)

Module 4
Quality Systems : Need for ISO 9000 and other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, ISO 14000 – Concept, Requirement and Benefits. (6)

Module 5
Benchmarking : Reasons to Benchmark, Benchmarking Process, Quality Function Development (QFD) – Cost of Quality, QFD Process, Six Sigma. (6)

Module 6
Quality Circle : Purpose, Benefits, Problem in implementation of quality circles, Requirements of Elective Circle. (6)

Module 7
Statistical Tools and Techniques : Role of Statistics in Business, Common Statistical Tools, Flow Diagram, Check Sheets, Correlation or Scatter Diagram. (6)

BOOKS:

1. Feigenbaum A.V. "Total Quality Management, McGraw-Hill, 1991.
2. Total Quality Management, Principles & Practice – S. K. Mandal, Vikas Publishing House, Pvt. Ltd.
3. Oakland J.S. "Total Qualaity Management Butterworth – Heinemann Ltd., Oxford,1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International, 1996.
5. Zeiri, "Total Quality Management for Engineers Wood Head Publishers, 1991.