Sl. No.	Course Code	Course Title	Contact Hours				Credits	% Weightage				ESE Duration Hrs.
			L	T	P	Total Contact Hrs.		MSE - I	MSE - II	TA	ESE	
I SEMESTER												
1	ME1951	Engineering Statistics & Design of Experiments	3	0	0	3	3	15	15	10	60	3
2		**Professional Elective I**	**3**	**0**	**0**	**3**	**3**	**15**	**15**	**10**	**60**	**3**
	ME1957	PEI:Quality Control & Metrology										
	ME1958	PEI:Reliability Engineering										
	ME1959	PEI: Design for Manufacturing and Assembly										
3	ME1952	Industrial Engineering	3	0	0	3	3	15	15	10	60	3
4	ME1953	Manufacturing Engineering - I	3	0	0	3	3	15	15	10	60	3
5	ME1954	Manufacturing Engineering - I lab	0	0	2	2	1			40	60	
6	ME1955	Computer Integrated Manufacturing	3	0	0	3	3	15	15	10	60	3
7	ME1956	Computer Integrated Manufacturing lab	0	0	2	2	1			40	60	
			15	**0**	**4**	**19**	**17**					
II SEMESTER												
1	ME1961	Tool Engineering	3	0	0	3	3	15	15	10	60	3
2	ME1962	Production Management	3	0	0	3	3	15	15	10	60	3
3	ME1963	*Manufacturing Engineering - II	3	0	0	3	3	15	15	10	60	3
4	ME1964	Manufacturing Engineering - II Lab	0	0	2	2	1			40	60	
5	ME1965	Computer in Production Management	3	0	0	3	3	15	15	10	60	3
6		**Professional Elective II**	**3**	**0**	**0**	**3**	**3**	**15**	**15**	**10**	**60**	**3**
	ME1967	PEII:Maintenance Engineering										
	ME1968	PEII:CNC and Robotics										
	ME1969	PE:II Welding Technology										
7	ME1966	Seminar	0	0	2	2	1			100		
			15	**0**	**4**	**19**	**17**					
III SEMESTER												
1	ME1971	Productivity Management	3	0	0	3	3	15	15	10	60	3
2		**Professional Elective III**	**3**	**0**	**0**	**3**	**3**	**15**	**15**	**10**	**60**	**3**
	ME1973	PEIII:Quantitative Techniques										
	ME1974	PEIII:Plastics and Composites										
	ME1975	PEIII:Project Evaluation & Management										
3	ME1972	Project Phase -I	0	0	16	16	8			100		1
			6	**0**	**16**	**22**	**14**					
IV SEMESTER												
1	ME1981	Project Phase -II	0	0	24	24	12				100	2
GRAND TOTAL OF CREDITS							**60**					

I Semester

ME1951	ENGINEERING STATISTICS AND DESIGN OF EXPERIMENT	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

The course aims to develop the engineering - analysis capability for engg-problems using basic statistical tools and techniques. Detailed treatment of various data analysis and handling technique leading to complete understanding and modeling the processes including its optimization is envisaged in this course. **(a,b,c,d,h,j,k)**

Unit 1 **[7 Hrs]**

Frequency Distribution & Histograms, Probability & its Distribution, Measures of Central Tendency & Distribution, Presentation of Statistical Data. Importance and significance of statistic in engineering industry, historical developments in quality improvement, introduction to probability and statistics. (a,j)

Unit 2 **[8 Hrs]**

Confidence intervals, Hypothesis Testing, Correlation, Liner & Multiple Repression Analysis, Signification Testing. Hypothesis testing of means (t, z test), variance (F, chi-square test), curve fitting. **(b,k)**

Unit 3 **[7 Hrs]**

Full & fractional factorial experiments, analysis of variance, Randomized experiments with single factor, drawbacks of Randomized designs, Multifactor Experiments and interaction effects estimation, MINITAB Introduction and application. **(b,c)**

Unit 4 **[7 Hrs]**

Group Method of Data Handling, Shainin Variable search technique (SVST), Latin square design, Response surface methodology (RSM), Mixture design, Regression Equation in Matrix form, Statistical optimization using criterion like 'D' optimal design. **(b,h)**

Unit 5 **[8 Hrs]**

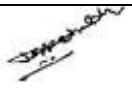
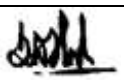
Taguchi techniques. Taguchi's philosophy, gradient loss function and its assessments for NB, HB, LB conditions, S/N ratio, Orthogonal arrays (OA), OA selection, DOE with Taguchi and Comparison with conventional DOE, case studies. **(b,k)**

Unit 6 **[8 Hrs]**

Concept of six sigma, DMAIC and DFSS, DOE and six sigma, DMAIC, case studies of six sigma implementation. **(d,k)**

Suggested Readings:-

1. Experimental Design by Cochran & Cox
2. Taguchi Techniques in Quality Engineering by Phillip J. Ross
3. Statistical Analysis for Engineers and Scientist by Barnes
4. Introduction to Probability and Statistics by Milton
5. Engineering Statistics by Bowker & Liberman
6. Montgomery D.C. " Design and analysis of experiments" John Wiley and sons, 7th edition 2009.
7. Mitra A, " Fundamentals of Quality control and Improvement", PHI, 2007
8. Miller and Fraud,"Probability and statistics for Engineers".

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1952	INDUSTRIAL ENGINEERING	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To understand the concept of work study and work measurement. Also to study different material handling equipments and plant layout. **(a,b,c,e,h,k)**

UNIT 1 **[8 Hrs]**

Introduction to production system, Types of production system, graph theory tech in manufacturing, (or industrial engineering) **(a,c,e,h,k)**

UNIT 2 **[8 Hrs]**

Plant location analysis, considerations in factory building design, classical plant layouts, evolution and evaluation of factory layout**,** Work measurement. **(a,b,c,e,h,k)**

UNIT 3 **[6 Hrs]**

Work measurement techniques, assessment of rating and determination of allowances. Method study Tech. **(a,c,e,h,k)**

UNIT 4 **[7 Hrs]**

Woks sampling techniques and assessment of plant utilization. **(a,c,e,h,k)**

UNIT 5 **[8 Hrs]**

Basic principles of Human factor engineering and its applications to workstation design, control panel design. Effect of environmental factors, shift planning. **(a,b,c,e,h,k)**

UNIT 6 **[9 Hrs]**

Study of various material handing equipments, considerations in design and selection of material handling systems, guiding principles for reduction in material handling cost. **(a,b,c,e,h,k)**

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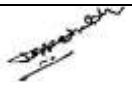
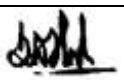
Suggested Readings:-

1. Work Study by I. L. O.
2. Time & Motion Study by Barnes
3. Time & Motion Study by Mundal
4. work Sampling by Barnes
5. Methods bww Engineering by Krick
6. Plant Layout and Material Handling by James Apple
7. Plant Layout by J. M. Moore
8. Ergonomics by Murral
9. Human Factor Engineering by McCormick
10. Work Study by Shan
11. Industrial Safety by Black
12. Accident Prevention by Henrich

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1953	MANUFACTURING ENGINEERING –I	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To enable students gain basic understanding metals cutting and manufacturing processes used in industry today and its techno-economic analysis. **(a,b,c,d,e,h,j,k)**

Syllabus

UNIT 1 **[7 Hrs]**

Theoretical basis of metal forming**,** classification, cold forming, hot working, effect of variables on metal forming processes, methods of analysis of forming processes. **(a,c,e,h)**

UNIT 2 **[8 Hrs]**

Techno economic analysis of forging, Open Die forging, Closed Die forging, Rolling, Rolling load, Rolling Torque and Power, Drawing, Wire Drawing, Tube drawing, Extrusion, Analysis of extrusion, Variation of extrusion pressure. **(a,b,c,e,h)**

UNIT 3 **[8 Hrs]**

Pattern design, sprue design, riser design based on A / V ratio, volumetric shrinkage, FEA of metal casting, latent heat incorporation, time stepping procedure. **(a,b,c,e,h,k)**

UNIT 4 **[6 Hrs]**

Shell moulding, precision investment casting, CO2 casting, Die casting, Continuous casting, counter gravity low pressure casting, layout of mechanized foundry, CAD of foundry. **(a,b,c,e,h,k)**

UNIT 5 **[7 Hrs]**

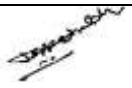
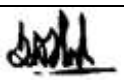
Advanced welding Techniques:- Ultrasonic, electron beam welding, laser beam welding, plasma welding, electro slag welding ,Robot in welding, nuclear welding, under water welding. **(a,c,e,h,j,k)**

UNIT 6 **[7 Hrs]**

Advanced Powder metallurgy. Fundamental Properties of Metal powders, Fabrication methods, advantages applications, forging, rolling, cutting tools. **(a,c,d,e,h)**

Suggested Readings: -

1. Processes & Materials of Manufacture by Roy A. Lindberg
2. Manufacturing Science & Technology Vol- I by S. Dalela
3. Materials & Processes in Manufacturing by Degarmo, black & Koster
4. Manufacturing processes for engineering materials by S. Kalpakiran and Schmit
5. ASM handbook Vol 15 Casting.
6. Manufacturing And science Ghosh and Mallik,

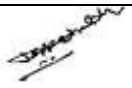
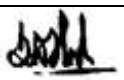
Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1954	LAB:MANUFACTURING ENGINEERING –I	L=0	T=0	P=2	Credits=1

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	0	0	40	60	100	

Practicals:

1. To study methods of analysis of forming process.
2. Demonstrations of principles of forging/Rolling operations. (Case study)
3. Introduction to patterns and preparation of patterns for casting process.
4. Demonstration of Preparation of mould for casting.
5. Testing of casting sand.
6. To study the Hydraulic Molding Process.
7. To study the characteristics of Pouring of metal to produce casting.
8. To study testing of casting for defects and Mechanical properties.

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1955	COMPUTER INTEGRATED MANUFACTURING	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES:

To develop in the engineering students the ability to analyze any engineering problem related to CIM, introduction of Group Technology, Material handling systems and integrated process planning system and its components. **(a,b,c,d,h,k,l)**

UNIT 1 Concept and scope of CIM, components of CIM, benefits, limitations, selection criteria for CIM. Introduction to CAD-CAM hardware and softwares. **(a,c,d,h,l)** [7hrs]

Unit 2 Introduction CNC and Robotics: NC, CNC and DNC, machining centers, adaptive control. Robots and their application. Robot cell layouts, multiple robots and considerations in work cell design. **(a,b,d,h,k,l)** [7 hrs/]

Unit 3 Introduction to Group Technology, Limitations of traditional manufacturing systems, characteristics and design of groups, benefits of GT and issues in GT .cellular manufacturing system.Part families , classification and coding , Production flow analysis , Machine cell design , Benefits. **(a,b,d,k,l)** [8 hrs]

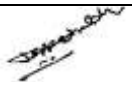
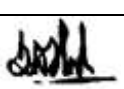
Unit 4 Introduction & Components of FMS , Application work stations ,Computer control and functions , Planning, scheduling and control of FMS , Scheduling , Knowledge based scheduling , Hierarchy of computer control , Supervisory computer Manufacturing data systems , data flow , CAD/CAM considerations , Planning FMS database, case studies on practical applications. **(a,b,d,h,k,l)** [8 hrs]

Unit 5 Automated material handling systems, AS/RS, general considerations , selection, evaluation and control . Inspection and Quality control, CAQC ,CMM types, working, applications. **(a,b,d,h,l)** [8 hrs]

Unit 6 Process Planning in the Manufacturing cycle , Process Planning and Production Planning Process Planning and Concurrent Engineering, CAPP, Variant process planning , Generative approach , Forward and Backward planning, Input format,Logical Design of a Process Planning , Implementation considerations ,manufacturing system components,**(a,c,d,h,l)** [7 hrs/]

Books for Reference:

1. Nanua Singh,"Systems Approach to Computer Integrated Design and Manufacturing", John Wiley & Sons, 1996.
2. Groover M.P., "Automation, Production Systems and Computer Integrated Manufacturing", Prentice-Hall of India Pvt. Ltd., New Delhi, 2002
3. Jha, N.K., "Handbook of Flexible Manufacturing Systems", Academic Press Inc., 1991.
4. Burbidge, J.L. "Group Technology in Engineering Industry", Mechanical Engineering pub. London, 1979.
5. Askin, R.G. and Vakharia, A.J., "G.T Planning and Operation, in The automated factory-HandBook: Technology and Management", Cleland, D.I. and Bidananda, B (Eds), TAB Books, NY, 1991.
6. Irani, S.A. "Cellular Manufacturing Systems", Hand Book.
7. Kamrani, A.K, Parsaei, H.R and Liles, D.H. (Eds), " Planning, design and analysis of cellular manufacturing systems" , Elsevier, 1995.
8. Gideon Halevi and Roland D. Weill, "Principles of Process Planning", a logical approach, Chapman & Hall, 1995.
9. Parashar BSN," Cellular Manufacturing" (PHI). R.V.Rao, "Decision making in manufacturing".

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1956	LAB : COMPUTER INTEGRATED MANUFACTURING	L=0	T=0	P=2	Credits= 1

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	--	--	40	60	100	

OBJECTIVES

Practicals: Based on above syllabus.

1. Concepts of Manufacturing systems and computer applications
2. CAD–CAM integration
3. GT
4. FMS
5. Robots and their application
6. AS/ RS
7. CAPP
8. CAQC
9. NC, CNC, DNC
10. Automated material handling,
11. Shop floor control

ME1957	QUALITY CONTROL & METROLOGY	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To emphasis the need of metrology and its role in quality control. To enable the students to take up metrology work in Industries using latest metrological equipments to impart knowledge to TQM and ISO-9000 and various associated techniques. **(a,b,e,h,l,m)**

Unit 1 **[8 Hrs]**

Concept of Quality, aspects of Quality, PDCA Cycle, Quality Control Methods of QC, QC tools, and tech, SPC Six Sigma, poka yoke, Measurement and inspection, significance and importance. **(a,e,h)**

Unit 2 **[7 Hrs]**

OC curve, Quality Control charts and their applications, process capabilities and indices Quality cost, online and offline QC, Robust design Application software for QC . **(a,e,l)**

Unit 3 **[8 Hrs]**

TQM, ISO 9000, 14000, and implementation and related issues. **(a,e,h)**

Unit 4 **[7 Hrs]**

Principles of metrology, sources of errors, standards of measurement, geometrical testing (alignment test of machine tool), surface roughness measurement, interferrometry , calibration, measurement of linear, angular and other geometric features like straightness, flatness parallelism & circularity. **(a,b)**

Unit 5 **[7 Hrs]**

Limit fit and tolerances:- design of plane and screw limit gauges. **(a,b,l)**

Unit 6 **[10 Hrs]**

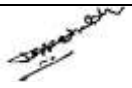
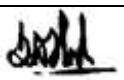
Machine vision, CMM, configuration, measuring techniques for internal and external dimensions, CMM applications, Reverse Engineering and dynamic measurement, Applications of LASER in metrology. **(a,m).**

Suggested Readings:-

1. Handbook of metrology-ASTME
2. Text book of engineering metrology by I. B. Gupta
3. Metrology by A. J. Scarr
4. Metrology by Gayler & Shotbolt
5. Assurance sciences by S. Halpern
6. managing for total quality by N. Logothetis

Reference Book:-

CMM manual - www.mitutoyo.com

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1958	RELIABILITY ENGINEERING	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Unit 1: **[8 Hrs]**

Introduction to reliability- Reliability definition, Failure rate, hazard rate, Reliability function and their variation with respect to time, MTTF and its calculations for discrete data. Reliability analysis and its relation with other parameters like strength etc.

Unit 2: **[8 Hrs]**

Reliability analysis for continuous data. Probability density function, failure rate and derivation of Reliability for various types of failures like constant failure rate, logarithmic failure rate in increasing/ decreasing failure rate etc. and there physical significance

Unit 3: **[7 Hrs]**

System Reliability series parallel and mixed configuration, system Reliability for complex systems using various tech. like successful path method, composite method etc. Redundancy, various types, parallel operations.

Unit4: **[8 Hrs]**

Reliability allocation and improvement, life cycle estimation, fault tree analysis, FMEA, FMECA etc,

Unit 5: **[7 Hrs]**

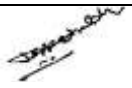
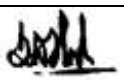
Reliability testing, accelerated life testing, sequential testing.

Unit 6: **[7 Hrs]**

Reliability availability, maintainability, maintainability improvement, Reliability economics.

Suggested Books:-

1. Introduction to Reliability Engineering by E.E.lewis and John wiley and sons
2. Reliability Engineering by L.S. Srinath
3. Reliability and engineering systems by L. Ryabinir
4. Practical Reliability Engineering by Patric Dtoconnor

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

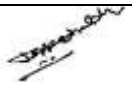
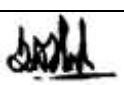
ME1959	DESIGN FOR MANUFACTURING AND ASSEMBLY	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

UNIT NO	DETAILS	Hours
Unit 1	Importance of product design, types of design, product definition, product specification, Phases of product development: conceptual, embodiment and detailed design, product and technology development cycle, concept generation and evaluation methods.	**[7 Hrs]**
UNIT 2	Material selection – Importance, classification, material performance characteristic, Selection criteria, Ashby Material selection chart	**[7 Hrs]**
UNIT 3	Evaluating part configurations for manufacturability, Evaluating parametric designs for manufacturability, Process selection – Impotence types of manufacturing processes and their classification, sources of information, selection criteria, introduction to material and process selection software	**[8 Hrs]**
UNIT 4	Benchmarking – DFM, DFX, Early supplier involvement, robust design, QFD and concurrent engineering. DFM analysis for various manufacturing processes,	**[8 Hrs]**
UNIT 5	Product design for manual assembly, product design for high-speed automatic assembly and product design for robot assembly.	**[8 Hrs]**
UNIT 6	Product Development Cycle and Importance of Prototyping, Types of Prototypes, Principle and Advantages & Different Type of Generative Manufacturing Process, Viz, Stereolithography, FDM, SLS etc. Factors Concerning to RP: Consideration for Adoptions, Advantages, Accuracy and Economic Considerations	**[7 Hrs]**

Book for reference:

1. Dieter George E. “Engineering Design”, McGraw Hill Pub. Company, 2000
2. Ulirich Karl T. and Eppinger Steven D., “Product Design and Development” McGraw Hill Pub. Company, 1995.
3. Bralla, James G., “Handbook of Product Design for Manufacturing” McGraw Hill Pub. Company, 1986
4. A. K. Chitale and R. C. Gupta, Product Design and Manufacturing, PHI Pvt. Ltd., 2002.
5. HARRY NYSTROM, " Creativity and innovation", John Wiley & Sons, 1979.
6. BRAIN TWISS, " Managing technological innovation", Pitman Publishing Ltd., 1992.
7. HARRY B.WATTON, " New Product Planning ", Prentice Hall Inc. 1992.
8. P.N.KHANDWALLA - " Fourth Eye (Excellence through Creativity) – Wheeler Publishing ",Allahabad, 1992.
9. I.P.R. Bulletins, TIFAC, New Delhi,

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

2nd Semester

ME1961	TOOL ENGINEERING	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To learn the mechanism of metal cutting and the design of metal cutting tools. Also to understand various presses working operations along with tools to dies design. **(a,b,c,d,e,f,g,h,i,j,k)**

Unit 1 **[8 Hrs]**

Theory of metal Cutting. Cutting tool materials, dynamics of metal cutting, Single point cutting tool, Merchant's Theory, Cutting power, Energy consideration in metal cutting, Tool life and dynamometry, Tool life criteria, variable affecting tool life, Machinability. **(b,c,e,g,i,j,k)**

Unit 2 **[8 Hrs]**

Design of single Point Cutting Tool .Form tools- design of form tools. Design of milling cutters. Design of Gauges, Materials, heat treatments, Taylor's Principals of gauge design, design of limit gauges.Design of broaching and reamers. **(b,c,e,g,i,j,k)**

Unit 3 **[10 Hrs]**

Press tool Design
Introduction, Press operations - Press working equipment - Classification, Rating of a press, Press tool Equipment, working of dies and their components. **(b,c,e,f,g,h)**

Unit 4 **[10 Hrs]**

Bending Forming & Drawing dies Bending methods, Design Principles, Design consideration.
(a,b,c,e)

Unit 5 **[7 Hrs]**

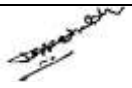
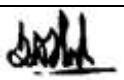
Forging Die Design .Die design for machine forging Tools for flash trimming & hole piercing, materials & manufacture of forging dies. Mould Design. **(a,b,c,e,h,i,j,k)**

Unit 6 **[10 Hrs]**

Design of jigs & fixture: - Introduction, locating & clamping - principle of location, principle of pin location, locating devices, radial or angular location, V - location, bush location. Design principle for location purpose, principle for clamping purposes, clamping devices, design principles common to jigs & fixtures. Drilling Jigs: - Design principles, drill bushes, design principles for drill bushings, Types of drilling jigs - Template jig, plate type jig, open type jig, swinging leaf jig, Box type jig, channel type jig . Jig feet. Milling Fixtures: - Essential features of a milling fixtures, milling machine vice, Design principles for milling fixtures, Indexing jig & fixtures, Automatic clamping Devices. **(d,e,f,g,h,i,j,k)**

Books for reference:

1. Donaldson, "Tool design"
2. ASTME, "Fundamentals of Tool design"
3. Pollock, "Fundamentals of Tool design"
4. Grant, "Unconventional Clamping Systems"
5. Kempster, "Fundamentals of Tool design"
6. Ramnathan "Design of Jig, Fixture & cutting dies"

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1962	PRODUCTION MANAGEMENT	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To study and learn the pre production activities and post production activities, forecasting, also to study and understand the material management functions. **(a,b,c,d,i,j)**

Unit 1 [8 Hrs]
Forecasting, type of forecasts, demand pattern, qualitative and quantitative forecasting models and applications. **(a,i)**

Unit 2 [9 Hrs]
Materials management functions – standardization, simplification and diversification, purchasing functions, inventory control – static and dynamic models, selective control, inventory control under constrains, stores functions & records, spares parts and in-process inventory, Fundamentals of supply chain management, Relevant case studies. **(b,d)**

Unit 3 [6 Hrs]
Generalized model of production system, design, optimization & control of production system, Layouts. **(c,j)**

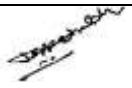
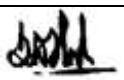
Unit 4 [7 Hrs]
High volume production systems – analysis of automated flow lines, assembly systems and line balancing **. (c)**

Unit 5 [6 Hrs]
Aggregate production and capacity planning, master planning scheduling and rough- cut capacity planning. Process Planning and MPS. **(b,c)**

Unit 6 [8 Hrs]
Production control functions, loading charts, sequencing and scheduling models, expending functions and short-term capacity control. **(b,c)**

Suggested Readings:-

1. Production & Operation Management by Adam & Ebert
2. Production & Operation Management by Buffa
3. Automation, Production System and CIM by M. P. Groover
4. Handbook of Material Management by Gopalkrishanan
5. Material Management – procedures, Test and cases by A. K. Datta
6. Production and operation management by Russel & Taylor III
7. Introduction and operation management by John Willey, Joseph S. Martinich

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1963	MANUFACTURING ENGINEERING -II	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To enable students gain basic understanding metals cutting and manufacturing processes used in industry today and its techno-economic analysis **(a,b,c,e,k,l,m)**

Syllabus

Unit 1 **[8 Hrs]**

Analysis and mechanics of metal cutting by single point cutting tool, milling , drilling and broaching, tool geometry, economics of machining process, tool life, tool wear. **(a,b,c,k,l)**

Unit 2 **[7 Hrs]**

Material removal by grinding, introduction, abrasive, mechanics of grinding, selection of grinding wheel, effect of temperature, types of grinding operation, grinding wheel wear, grinding wheel glazing, operating conditions, effective wheel hardness, trueing and dressing. **(a,b,k)**

Unit 3 **[8 Hrs]**

Control of material properties, heat treatment process, recovery, recrystalization and grain growth, defect in steel due to heat treatment, heat treatment of steel casting, shaft, axle, wires etc., types of heat treatment furnace **(a,b,k,l)**

Unit 4 **[7 Hrs]**

Plastic and composite processing, properties of plastic, additives in plastics, extrusion of plastics, injection molding, glow molding, thermo forming, thermo setting materials, composite processing, plastic product design. **(a,b,k)**

Unit 5 **[7 Hrs]**

Super finishing operations, super finishing operations, honing, lapping, electro forming, metal spraying , electron beam coating, chemical vapor deposition , laser treatment for surface modification. **(a,b,l)**

Unit 6 **[6 Hrs]**

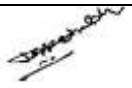
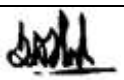
Non conventional machining, effect of various process parameters on metal removal rate in AJM, ultrasonic machining, ECM, EDM, LVM, EBM, PAM, explosive fabrication, economics of machining**. (a,l)**

Suggested Readings:-

1. Production Technology by HMT
2. Metal Cutting - Theory & Application by A. Bhattacharya
3. Manufacturing Science by Ghosh, Mallick
4. Modern Machining Processes by Pandey & Shan
5. Modern Machining methods by M. Adithan

Reference Books:-

- ASM Handbook Vol. 6 Welding Brazing & Soldering 2003.
- Manufacturing process for engg. Material by kalpak jain & Schmid S.R,2004
- ASM Handbook, Forming &Forging, Ninth Edition Vol 14,2003

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1964	LAB: MANUFACTURING ENGINEERING –II	L=0	T=0	P=2	Credits=1

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	0	0	40	60	100	

Practicals:

1. Testing of machine tool.
2. Experiment to study the effect of process variable on any one NCMP like EDM, LASER, ECM etc.
3. Heat Treatment of HSS
4. Study of joining methods for plastics
5. Injection molding of plastics & study of Process characteristics.
6. Curing studies of resign to study effect of additives & variables.
7. Preparation of sheet moulding components using SMC
8. Preparation of compression moulding components using SMC.
9. Testing of Composites products For Mechanised Properties.

ME1965	COMPUTERS IN PRODUCTION MANAGEMENT	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

This engineering course focuses on understanding the structure of database, design of database, different types of database and query languages and constraints and pitfalls in database design.
(a,d,e,h,k)

Unit 1 **[7 Hrs]**
DBMS: Drawbacks of general files processing system, basic concept of database system, architecture of database system, data structures & corresponding operators, distributed & relational databases. **(a,d,e,h,k)**

Unit 2 **[8 Hrs]**
Relational DBMS, data structures, architecture of system – R, data structure, data definition language (SQL-DDL), SQL – DML, internal and external level of system, QBE. **(a,d,e,h,k)**

Unit 3 **[7 Hrs]**
Normalization, SQL forms, triggers, SQL loader. Hierarchical approach to DBMS, mapping techniques, IMS structure. **(a,d,e,h,k)**

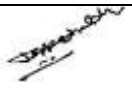
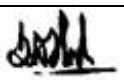
Unit 4 **[8 Hrs]**
Network approach to DBMS (DBTG), External level of DBTG, subschema, schema definitions, data manipulation constructs. **(a,d,e,h,k)**

Unit 5 **[7 Hrs]**
Overview of MIS, Concept of DSS, expert system, artificial Intelligence. **(a,d,e,h,k)**

Unit 6 **[8 Hrs]**
Selection of computer system architecture networking time sharing and cost analysis, Exposure to latest packages. Case Studies on Design of MRP, Design of Inventory control system, Payroll system, Maintenance Management System, Sales Management system, HRD system.
(a,d,e,h,k)

References:

- Abraham Silberschatz, Henry F. Korth, S.Sudarshan, “Database System Concepts”, McGraw Hill International Editions, Third Edition
- P. Beynon-Davies, “Expert Database Systems – A Gentle Introduction”, McGraw Hill International; 1991
- James Martin ,“Database Management Systems Oracle unleased series.
- Principles of Database Management by Martin. James Obrien,” Management Information System.”
- Rolston D.W.,”Artificial Intelligence and Expert System”.
- Goyal D.P ,” Management Information System.”

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1966	SEMINAR	L=0	T=0	P=2	Credits=1

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	0	0	100		100	

Each student of the concern project shall present and seminars using audio visuals, aids of on their project methodology. Seminar delivery will be followed by question – answer session. The student shall also require to submit minimum 3 page report about the progress. The minimum 3 member seminar committee shall be constituted for the purpose of evaluating seminar.

ME1967	MAINTENANCE ENGINEERING	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

The overall objective is to gain the knowledge about recent trends in maintenance and measure the efficiency/ effectiveness of production systems. After completing the course students should obtain the knowledge of theoretical fundamentals and practical methods for decisions making according tribological problems in design and maintenance of machines and develop the ability to apply them to practical situations:

- understand the principles and know the methodology of performing the condition monitoring;
- have good knowledge about the technologies and methods to increase the reliability of machinery elements
- know the basic principles of maintenance and trends important for reliable operation of machinery.

Unit 1 **[8Hrs]**

Maintenance – Objective and functions, Types of Maintenance and their industrial applications, Organization for maintenance R,A,M, Bath tub curve and its relevance to maintenance .

Unit 2 **[7 Hrs]**

Maintenance cost estimation – various tech. Evaluation of maintenance performance.

Unit 3 **[8 Hrs]**

Failure analysis, its importance to maintenance, various tech, Engineering analysis of failure and report writing.

Unit 4 **[8 Hrs]**

Lubrication, its importance, lubrication properties, management of effective lubrication system, lubricant testing- various tech.

Unit 5 **[7 Hrs]**

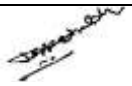
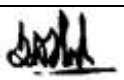
Condition monitoring- online offline, Use of various NDT tech, for monitoring of thickness, cracks, corrosion etc.

Unit 6 **[7Hrs]**

Machine diagnostics, machine condition monitoring and significance analysis, vibration and noise monitoring, fault identification.

Referance Books:

1. Reliability Engineering by L. S. Shrinath
2. Reliability of Engineering System by L. Ryabinin
3. Practical Reliability Engineering by Patric D.T. O' Connor
4. The Assurance Science by Helpern:-
5. Maintenance Engineering Hand Book by Hinggins
6. Maintenance Planning & Control by Anthony Kelly
7. Industrial Maintenance by H. P. Gerg
8. Industrial Maintenance Management by Newborangh
9. Maintenance and spare parts management by Gopalkrishnan and Banarjee
10. Management of Indutrial Maintenance by A. Kelly & M.J.Harris

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1968	CNC AND ROBOTICS	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective: To understand the need and process of automation in industry. Study the Computer Numerically Controlled machines robots and their components, functions, functions, programming and applications and integration of machines with the computers.

CNC and Robotics:

Unit 1:

Concepts of NC, CNC, DNC. Classification of CNC machines, Machine configurations, Types of control,CNC controllers characteristics, Interpolators.
Cutting tool materials, carbide inserts classification, qualified; semi qualified and preset tooling, tooling.system for Machining centre and Turning centre, work holding devices, of CNC Machines.

Unit 2:

Programming CNC machines, Part print analysis and Process planning, Advanced Programming features,Canned cycles, Subroutines, Macros, special cycles etc. APT part programming using CAD/CAM, Computer assisted part programming techniques, Conversational and Graphics based software.

Unit 3:

Adaptive CNC control techniques. Integration of CNC machines for CIM.

Unit 4:

Robotics, Basic concepts, Robot configurations, Basic robot motions, Types of drives, Applications. Homogeneous transformations and Manipulator, Forward solution, Inverse solution.

Unit 5:

Controls and end effectors, Control system concepts , Analysis , control of joints , Adaptive and optimal control. End effectors, Classification, Mechanical , Magnetic ,Vacuum , Adhesive , Drive systems , Force analysis and Gripper design**.**

Unit 6:

Robot programming, Methods, Languages ,Computer control and Robot Software – Programming Languages. Sensory devices, Non optical and optical position sensors , Velocity and Acceleration , Range , Proximity, touch , Slip , Force ,Torque.
Integration of Robots for CIM.

Books for Reference:

1. Krar, S., and Gill, A., “CNC Technology and Programming”, McGraw Hill publ Co, 1990.
2. Gibbs, D., “An Introduction to CNC Machining”, Casell, 1987.
3. Seames, W.S., “Computer Numerical Control Concepts and Programming”, Delmar Publishers,1986.
4. Lynch, M., “Computer Numerical Control for Machining”, McGraw Hill, 1992.
5. Koren Y, “Computer Control of Manufacturing Systems”, McGraw, 1986.
6. Fu K.S., Gonzalez R.C., and Lee C.S.G.,” Robotics control, sensing, vision, and intelligence”, McGraw-Hill Book Co., 1987.
7. Klafter R.D., Chmielewski T.A. and Negin M.,” Robot Engineering An Intergrated approach”, Prentice Hall of India, New Delhi, 1994.
8. Deb S.R., ”Robotics Technology and Flexible Automation”, Tata McGraw-Hill Publishing Co.,Ltd., 1994.
9. Craig J.J., ”Introduction to Robotics Mechanics and Control”, Addison-Wesley, 1999

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ME 1969	WELDING TECHNOLOGY	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objectives: To Study and analyse various welding methods with advanced techniques to pin engineering materials.

UNIT-I: . **[7 hrs]**
Classification of welding processes, present status, joint design, welding symbols, welding parameters, welding polarity, heat input and power density of heat sources **[a,m]**

UNIT-II: . **[7 hrs]**
Study of welding processes such as oxyacetylene, resistance, spot, seam, electron beam, laser beam welding: Scope, Keyholing techniques**. [c,e,m]**

UNIT-III: . **[8 hrs]**
Study of different parameters affecting quality Electrode classification, Properties of shielded gases used in welding, study of special welding processes such as Plasma arc, TIG, MIG, submerged arc welding**. [a,m]**

UNIT-IV: . **[7 hrs]**
Mode of metal transfer, Welding problems and remedies in steels, cast irons, stainless steels and non-ferrous metals and alloys, requirements for quality control. **[a,m]**

UNIT V: **[8 hrs]**
Importance of welding metallurgy, weld ability, heat flow in welding, HAZ and distortion, numerical based on heat transfer and width of heat affected zone. **[a,e,m]**

UNIT VI: **[8 hrs]**
Classification and analysis of welding defects, Weldment testing Destructive and Non-Destructive, visual inspection, Dye penetrant test, Eddy current testing and ultrasonic testing. **[a,c,m]**

Text books/Reference Books:

1	Welding and welding Technology	1st Edition (1997)	R.S.Parmar	Khanna Publications
2	Welding	10th Edition	A.C. Davies, Davies	Cambridge University press, 2002
3	Laser Machining and Welding	Edition (2007)	Rykalin, Uglov, Kokora	Pergamon Press, 1978
4	Welding and welding Technology	1st Edition (2008)	Richard Little	McGraw Hill
5	Weding Metallurgy	2nd Edition (2003)	Sindo Kou	John Wiley & Sons, 2003
6	Manufacturing Science	-	Ghosh and Mallik	Ellis Horwood
7	Manufacturing Technology Vol-1 3E	3rd Edition (2009)	P.N.Rao	Tata McGraw Hill

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3rd Semester

ME1971	PRODUCTIVITY MANAGEMENT	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective: To develop engineering student to use different techniques of quality improvement and productivity improvement. New techniques for product quality, elimination of poor production and to eliminate the waste to continuous improvement of activities.. **(a,b,c,d,e,h,i,j,k)**

Unit 1: Introduction **[7 Hrs]**

Basic concepts of productivity, definitions, productivity cycle, phases of productivity management productivity and organizational performance, issues of productivity management in manufacturing and service organizations, organizations for productivity management. **(a,c,h,k)**

Unit 2: Product Development **[7 Hrs]**

Customer focus and orientation. New product development, QFD, product life cycles. Phases of product development: conceptual, embodiment and detailed design, product and technology development cycle, concept generation and evaluation methods. **(a,c,h,k)**

Unit 3: Costing **[7 Hrs]**

Pricing decisions under different markets conditions, market structures, managing products and services, determination of cost production, economies and dis-ecomnies of scale, returns to scale. Investment Decision Analysis Sensitivity Analysis. Methods of Cost Estimates. Industrial Engineering Approach, Parametric Approach, **(a,b,c,d,e,h,k)**

Unit 4: Productivity Measurement **[8 Hrs]**

Total factor and partial factor productivities, measurement of productivity, Productivity Models: Productivity Measurement at International, National and organization level, total productivity models. Productivity Management in manufacturing and service sector. Productivity evaluation models. **(a,b,c,d,h,k)**

Unit 5: Productivity Improvement **[8 Hrs]**

Productivity improvement model and techniques, Quantitative techniques for improving productivity. Productivity improvement through quality and people, TQM concepts, strategies and techniques. **(a,c,h,k)**

Unit 6: Modern Productivity Improvement Techniques **[8 Hrs]**

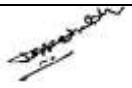
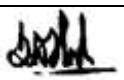
Modern approach for productivity improvement – TPM, JIT, Kanban, SPF, SMED, Autonomation, poka-yoke. Kaizen and innovation, QC, 5S, BPR, Quality system and ISO 9000. **(a,b,c,d,h,i,j,k)**

Text Books :-

1. A. V. Feigenbann , “Total quality control “
2. D. J. Simanth ,”Productivity Engineering & Management “
3. S. R. Udpa ,”Quality circles “
4. Philip Kotlar,”Marking Management “
5. M. Imai ,”Kaizen “
6. Hammer & Champy ,”Re-engineering the corporation “

Reference Books :-

1. Productivity engineering and management Sumanth, D.J. – Tata McGraw-Hill,New Delhi 1990.
2. Organisational transformation and process re-engineering – Edsomwan, J.A., -British Library Cataloging in Pub. data 1996.
3. Productivity Plus: How Today’s Best Run Companies Are Gaining the Competitive Edge – John G., Jr. Belcher – Butterworth-Heinemann
4. Business Process Improvement: The Breakthrough Strategy for Total Quality,Productivity and Competitiveness – H. James Harrington – McGraw-Hill
5. Handbook for Productivity Measurement and Improvement – Carl G. Thor Productivity Press
6. Re-engineering and re-inventing the enterprise – Rastogi, P.N., – Wheeler publications, New Delhi 1995.
7. Productivity Management – Systems approach – Premvrat, Sardana, G.D. and Sahay, B.S. – Narosa Publications, New Delhi, 1998.
8. The new Manufacturing Architecture – Mahadevan

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1972	PROJECT PHASE I	L=0	T=0	P=16	Credits=8

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
			100		100	

OBJECTIVES

As the project methodology for the batches is decided in the 2nd semester the student shall carry out the project work further 3rd semester. The project work consists of ;

1. A comprehend since and update survey of literature.
2. Study of processes /phenomenon related to project.
3. Design of any equipment its fabrication and testing.
4. Critical analysis of design or process for optimization
5. Verification by experimentation.
6. In case of industrial project the necessary modifications with the proper drawing / design suggested to the industry should be explained. The letter from the industry should be attached in the report related to the performance of the student.

ME1973	QUANTITATIVE TECHNIQUES	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

Objective: To understand concept of different quantitative techniques that include linear programming, dynamic programming and non-linear programming and the students should be able to use different decision making theories**.**

Unit 1: Linear Programming [7 Hrs]

Liner programming: formulation of or problems, solution of LPP by revised simplex methods. Duality theory and dual simplex method. Sensitivity analysis.

Unit 2: Advanced Linear Programming [7 Hrs]

Pure & mixed integer programming, Zero-one programming. Introduction to multi objective programming. Goal programming and application

Unit 3: Dynamic Programming [7 Hrs]

Dynamic programming : Decision tree. Bellman's principle of optimality. Application in industry.

Unit 4: Queuing System [7 Hrs]

Waiting line models: M/M/1 Model, single channel multiphase models with various distribution. Monte Carlo simulation and its application.

Unit 5: Game Theory [7 Hrs]

Decision making, decision theory, game theory

Unit 6: Non Linear Programming [7 Hrs]

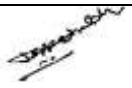
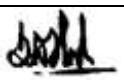
Non-liner programming : Fibonacci and golden section search: Powells pattern search algorithm, the Kuhn tucker conditions, complimentary Pivot algorithm, optimizations by geometric programming.

Text Books :-

1. Gupta ,Swaroop," Operation Research"
2. Hira , Gupta," Operation Research Techniques"

Reference Books:

1. Ravindran, Phillips Solberg , "OR Principles & Practice "
2. Hiller Libermen, "OR (Operation Research)"
3. Taha ,"OR (Operation Research) "
4. S.S. Rao , " Optimization Techniques"

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

ME1974	PLASTICS AND COMPOSITES	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

OBJECTIVES

To develop in the engineering students the ability to learn the basic structure of plastic, its properties and the manufacturing of objects from plastics & composites. The students will also learn the concept of machining and joining of plastics. **(a,b,d,e,j,k,l,m)**

UNIT1 **[7 hrs]**

Chemistry and Classification of Polymers - Properties of Thermo Plastics - Properties of Thermosetting Plastics - Applications - Merits and Disadvantages. Various plastic materials and their Applications . **(a,k,l,m)**

UNIT 2 **[7 hrs]**

Study of molding processes and mold design for :
Extrusion - Blow Molding – Casting – Thermo Forming – Rotomolding . **(a,b,j,k,l,m)**

UNIT 3 **[8 hrs]**

Study of molding processes and mold design for :
Compression and Transfer Molding - Injection Molding. **(a,b,k,l)**

UNIT 4 **[8 hrs]**

General Machining properties of Plastics - Machining Parameters and Their effect - Joining of Plastics - Mechanical Fasteners - Thermal bonding - Press Fitting. **(a,b,k,l)**

UNIT 5 **[8 hrs]**

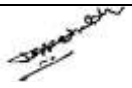
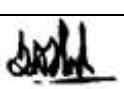
Fibers - Glass, Boron, Carbon, Organic, Ceramic and Metallic Fibers - Matrix Materials - Polymers, Metals and Ceramics.
Open Mould Processes, Bag Molding, Compression Molding with BMC and SMC - Filament winding - Pultrusion - Centrifugal Casting - Injection Molding - Application of PMC's.
(a,b,d,e,k,l)

UNIT 6 **[7 hrs]**

Solid State Fabrication Techniques - Diffusion Bonding - Powder Metallurgy Techniques - Plasma Spray,Chemical and Physical Vapor Deposition of Matrix on Fibers - Liquid State Fabrication Methods - Infiltration - Squeeze Casting - Rheo Casting - Compocasting - Application of MMCS. **(a,b,d,e,k,l)**

.**Books for Reference**:

1. Harold Belofsky, Plastics , “Product Design and Process Engineering”, Hanser Publishers, 1995.
2. Bera, E and Moet, A, “High Performance Polymers”, Hanser Publishers, 1991.
3. Hensen, F, “Plastics Extrusion technology”, Hanser Publishers, 1988.
4. Johannaber F, “Injection Moulding Machines”, Hanser Publishers, 1983.
5. Rauwendaal, C, “Polymer extrusion”, Hanser Publishers, 1990.
6. Rosatao, D.V., “Blow Moulding Handbook”, Hanser Publisher, 1989.
7. Seamour,E.B., “Modern Plastics Moulding”, John Wiley.
8. John Dalmonte, “Plastics Moulding”, John Wiley.
9. Akira Kobyashi, “Machining of Plastics”, Mc-Graw Hill.
10. Krishan K.Chawla, “Composite Materials science and Engineering”, Springer-Verlag, 1987.
11. Agarwal. D. and Broutman L.J., “Analysis and Performance of Fiber Composites” , Wiley, 1990.
12. Mallick, P.K. and Newman, S.,“Composite Materials Technology”, Hanser Publishers, 1990.

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

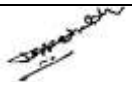
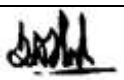
ME1975	PROJECT EVALUATION & MANAGEMENT	L=3	T=0	P=0	Credits=3

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
	15	15	10	60	100	3 Hrs

UNIT NO	DETAILS	Hours/Marks
Unit 1	**Project Identification** considering objectives and SWOT analysis, Screening of Project Ideas, Technical, Market, Financial, Socioeconomic and Ecological Appraisal of a project demand forecasting, secondary data, accuracy, confidence level, uncertainty.	**[7 H/M]**
UNIT 2	**Technical feasibility** : Process selection, Level of automation, plant capacity, acquiring technology, Appropriate technology plant location, Equipment selection & procurement, Govt. policies. Value analysis and project evaluation:	**[7 hrs/M]**
UNIT 3	**Economic feasibility:** Cost of Project, working capital analysis, fixed cost, means of finance, estimation of sales & production price analysis, Break even point, Projected cash flow statements, projected balance sheet, projected profit & loss statement, projected cash flow, rate of return, Discounted payback period, cost benefit analysis, return after taxes.	**[9hrs/M]**
UNIT 4	Mathematics of Time Value of Money, Cost Comparison, Depreciation, Taxes, Inflation, Profitability of Investment and Investment Decision Analysis Sensitivity Analysis. Methods of Cost Estimates. Industrial Engineering Approach, Parametric Approach	**[7 hrs/M]**
UNIT 5	**Project report:** Preparation of project report, risk analysis, sensitivity analysis, methods of raising capital	**[7 hrs/M]**
UNIT 6	**Project review :** Initial review, performance analysis , ratio analysis, sickness, project revival, Project Monitoring with PERT/Cost, Organizational aspects, Computer packages and Project Completion environ-mental & social aspects.	**[8hrs/M]**

Recommended books :

- Projects, Prasanna chandra, Tata mc graw Hill publishing company Ltd.
- CPM & PERT, Shrinath, East West publisher
- Projects, P.K. Joy, Macmillon
- Engineering Economy H. G Thuesen, W J Fabricky, G,J, Thuersen, Printce Hall of India Pvt. Ltd.
- ICFAI, Finance series 'Project management' , Vol-I1 and Vol-III, ICFAI,Press Hyderabad
- M.Y.Khan 'Finance Management' Tata McGraw hill, 4th Edition, 2004
- Prasanna Chandra 'Finance Management'
- Thusen 'Engineering Economics' ELBS Ed.

Chairperson		Date of Release	May 2014	Applicable for AY 2014-15 Onwards
Dean (Acad. Matters)		Version	1.00	

4th Semester

ME1981	PROJECT PHASE II	L=0	T=0	P=24	Credits=12

Evaluation Scheme	MSE-I	MSE-II	TA	ESE	Total	ESE Duration
			40	60	100	

Objectives:

As per the Project Phase 1, the students should carry out and submit the project work that include the implementation of all Semesters subjects knowledge with required validation and certification.