



Mandsaur University, Mandsaur(M.P.)

Department of Mechanical Engineering

M. Tech. Industrial Engineering & Management (Semester-II)

W.e.f.(session2016-17)

Name of Subject With Code No.	Maximum Marks Allocation				Lectures per week			Credits	Total Marks
	Theory Paper		Practical Examination	Continuou s Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Analysis & Control of Manufacturing Systems (MEC100)	30	60	-----	10	4	0	0	4	100

COURSE OUTCOMES:

1. Explain the importance of production management
2. Classify various models
3. Solve industrial problems involved in inventory, MRP and scheduling

Unit1:Basics of Product management – Forecast models, errors, tracking signals, Inventory costs – types of systems – policies – Analysis & static models Process Control for variables: definition of SQC, Q.A., TQC, benefits and limitation of SQC, Quality control: Quality cost-Variation in process causes of variation –Theory of control chart- uses of control chart – Control chart for variables – X chart, R chart, and σ chart -process capability – process capability studies and simple problems. Six Sigma Approach.

Unit2:Concept of aggregate production planning – strategies – Charting techniques – Problems Value stream management , Product scheduling and routing, Zero inventory system, JIT(just in time approach).

Unit3: Productivity & reliability as angles of quality, basic & modern tools in total quality improvement, process capability, OC curves, innovative Kaizen,5-S, Poka-yoke, Kanban ,QFD, Taguchi approach to robust designs, Concurrent engineering., FMEA, process evaluation by DOE, introduction to RSM, Kaneisi method, World class manufacturing.

Unit4:Scheduling concepts – Various types of scheduling – Methods and tools to solve scheduling problems – Assembly line balancing problems .

References

1. Quality control : S.C. Mahajan
2. Monks J.G., “Operations Management.
3. Buffa.E.S. and Sarin, R.K. ,“Modern production /Operations Management”, John Wiley & Sons, 1994.
4. Panneerselvam.R. Production and Operations Management, PHI, 2005.



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Advanced Operations Research (MEC090)	30	60	-----	10	4	0	0	4	100

COURSE OUTCOMES:

1. Make decisions in certainty / uncertainty conditions
2. Formulate models and solve real time problems
3. Apply advanced OR techniques to confront industrial requirements

Unit1: Models of OR, Formulation of LPP, Linear programming- Simplex method – Big M method – Two phase method cases , Changes in right- hand side constants of constraints- changes in objective function co-efficient-adding a new constraints-adding a new variable.

Unit2: Dual simplex method- Generalized simplex algorithm –Integer programming algorithm, Deterministic dynamic programming –Recursive nature of computations in DP - Applications of dynamic programming - Cargo loading model – Work force size model – Equipment replacement model-Inventory model.

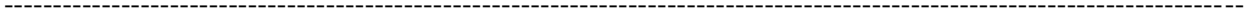
Unit3: Transportation Model: Transportation: Optimality Test, Degeneracy unbalanced Problems, N-W Corner rule, stepping stone method, VAM (Vogel's approximation method), MODI (Modified Distribution Method) Optimality test.

Unit4:PERT & CPM, Network models , Crashing of project network – Resource leveling & Resource allocation technique. Project Duration time.

References

1. Operations Research : Hira & Gupta
2. Handy M.Taha, "Operations Research, an introduction.
3. G.Srinivasan , "Operations Research Principles and Applications" ,PHI 2008

- Experiments should be according to the above syllabus.





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M. Tech. Industrial Engineering & Management (Semester-I)

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	Theory Paper		Practical Examination	Continuous Evaluation	L	T	P		
	Mid Sem. Test (MST) F ₁	End Sem. Test (EST) F ₂							
Data Analytics (MEC080)	30	60	-----	10	4	0	0	4	100

COURSE OUTCOMES:

1. Recognize the importance of data analytics
2. Exhibit competence on data analytics packages
3. Apply solution methodologies for industrial problems

Unit 1: Descriptive Statistics ,Introduction to the course,Descriptive Statistics,Probability Distributions Multivariate Variables-Review of Univariate and Bivariate Statistics- Data Prior to Analysis-Missing Data, Outliers, Normality, Linearity, and Homoscedasticity.

Unit 2:Inferential Statistics through hypothesis tests,Multiple Regression- Linear and Nonlinear techniques- Backward-Forward-Stepwise-Hierarchical regression-Testing interactions (2way interaction) - Analysis of Variance and Covariance (ANOVA & ANCOVA) - Multivariate Analysis of Variance . Logistic regression: Regression with binary dependent variable -Simple Discriminant Analysis-Multiple Discriminant analysis-Assessing classification accuracy- Conjoint analysis (Full profile method).

Unit 3:Principal Component Analysis -Factor Analysis- Orthogonal and Oblique Rotation-Factor Score Estimation-Multidimensional Scaling-Perceptual Map-Cluster Analysis (Hierarchical Vs Nonhierarchical Clustering). Model Validation Approaches, Logistic Regression,Linear Discriminant Analysis, Quadratic Discriminant Analysis, Regression and Classification Trees Latent Variable Models an Introduction to Factor, Path, and Structural Equation Analysis- Time series data analysis (ARIMA model) – Decision tree analysis .

References

1. Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. “ Applied multiple regression/correlation analysis for the behavioral sciences”, Routledge.,
2. Tabachnick, B. G., & Fidell, L. S. PHI
3. Gujarati, D. N. , “Basic econometrics”, Tata McGraw-Hill Education,
4. Malhotra, N. K., “ Marketing research: An applied orientation”, 5/e. Pearson Education India.

- Experiments should be according to the above syllabus.



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I Semester

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Subject Code	Subject Name	Theory			Practical			Hours/Week			Credits	Total Marks
		End Sem	Mid Sem	Quiz/ Ass.	End Sem	Lab Work	Quiz/ Ass.	L	T	P		
MEC110	FINANCIAL MANAGEMENT	60	30	10	0	0	0	3	1	0	4	100

COURSE OUTCOMES:

1. Start and manage new business
2. Evaluate and monitor short term and long term investments
3. Evaluate and monitor current asset

Unit1:Financial management – An overview - Nature, Scope, Objectives, Decisions - Management of current asset - Short and intermediate financing Capital budget, Nature of capital budgeting- Identifying relevant cash flows - Evaluation Techniques: Payback, Accounting rate of return, Net Present Value, Internal Rate of Return, Profitability Index .

Unit2:Comparison of DCF techniques investment and evaluation Financial and operating leverage - capital structure - Cost of capital and valuation - designing capital structure. Dividend policy - aspects of dividend policy - practical consideration

Unit3:Principles of working capital: Concepts, Needs, Determinants, issues and estimation of working capital - Accounts Receivables Management and factoring - Inventory management – Cash management – Working capital finance.

Unit4:Long term financing -Indian capital and stock market, New issues market Long term finance: Shares, debentures and term loans, lease, hire purchase, venture capital financing, Private Equity

References:

1. Bhattacharya, S.K. and John Deardon, “Accounting for Management – Text and Cases”, Vikas Publishing House, New Delhi, 1996.
 2. Prasanna chandra, “Financial Management theory and practice”, TMH, Vth edition, 2001.
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I Semester

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MEC120	MARKETING MANAGEMENT (Elective Subject)	60	30	10	0	0	0	3	1	0	4	100

COURSE OUTCOMES:

1. Explain marketing concepts & segmentation factors
2. Classify various pricing methods
3. Explain various sales promotion aspects

Unit1: Concepts in Marketing - Marketing Process, Marketing concepts, Environment-Buying Behaviour and Market Segmentation-factors, Motives, Types, Buying Decision, Segmentation factors, Demographic, Psychographic and Geographic Segmentation, Process, Patterns

Unit2: Product Pricing and Marketing Research- Pricing, Decisions and Pricing Methods, Pricing Management-Marketing Planning and Strategy Formulation-Portfolio Analysis, BCG, GEC Grids, used in the marketing of various products.

Unit3: Advertising, Sales Promotion and Distribution-Impact, Goals, Types, Sales Promotion – Point of purchase, Unique Selling propositions, Characteristics, Wholesaling, Retailing, Channel Design, Logistics Modern Trends in Retailing.

References:

1. Kotler Philip, Kevin Lane Keller, “Marketing Management”, 13th Ed., Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2007.
 2. Michael J. Etzel, Bruce J. Walker, William J. Stanton, Ajay Pandit, “Marketing – concepts and cases”, special Indian edition, McGraw Hill .
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